DISTANCE LEARNING MIGRANT EDUCATION PROGRAM

GRADES 7-8

2014 GUIDE FOR TEACHERS

ESC 20 Serving the Educational Community

TEA Texas Education Agency

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Grades 7-8 Overview

Unit 1, Lesson 1 *Ricardo's Race*

This is a quick snapshot of each of the three math lessons for this unit. For detailed instructions, balanced literacy objectives and enrichment ideas, refer to the complete lesson plans for each lesson. **NOTE: All BLM are per student unless otherwise indicated.**

Lesson Segment	Math Objectives	Language Objectives	Activity	Manipulatives	Supplies
Daily Routine 30 – 45 minutes	Pre-assess summer skills	Pre-assess summer skills	**Administration of Pre-assessment**		• **Pre-assessment** 1 per student
Classroom Lesson 30 min. – 1 hour	Compare rates of speed and unit rates from previous life experiences.	Discuss attributes *(characteristics)* of champions. Write words that describe attributes of champions and strategically place them on a Word Web. Discuss and write vocabulary word from ***Ricardo's Race***.	**Vocabulary** Develop a word web which can be used after reading the story. **Literature** Use actual photos of Ricardo Romo to interest students in the real person. **Transition to Math** Students connect ratios and rates to literature read during the Classroom Lesson.		• Word Web technology such as ***Inspirations*** (optional) • **BLM** Vocabulary word cards (class set) • Webbing instrument such as Inspirations or other tool for creating webs • ***Ricardo's Race*** by Diane Gonzales Bertrand • Individual student journals
Math Lesson 30 minutes	Write rates as ratios *(fractions)* with proper labels. Compare rates with unit rates. Draw a visual representation to compare two ratios. Use a pattern to find equivalent ratios. Use cross multiplication to solve for an unknown. Create a graph to solve a rate problem.	Write rates and ratios using proper labels. Talk about the differences between rates, ratios and unit rates. Discuss problem solving strategies with peers. Work with others to solve problems. Talk about the differences between rates, ratios and unit rates.	**Vocabulary** Use vocabulary pervasively in the lesson, including literature vocabulary (see suggestions in side bar of lesson). **Mathematics** Explore various strategies for solving problems that deal with rates and ratios.	• straight edge • 4-function calculator (optional)	• **BLM** Rate Chart **BLM** Ricardo's Rate • **BLM** Grid

Follow-up Lesson 30 min. – 1 hour *(including Snack Fractions)*	Write rates as ratios (fractions) with proper labels. Compare rates with unit rates. Draw a visual representation to compare two ratios. Use a pattern to find equivalent ratios. Use cross multiplication to solve for an unknown. Create a graph to solve a rate problem.	Write rates and ratios using proper labels. Talk about the differences between rates, ratios and unit rates. Discuss problem solving strategies with peers. Work with others to solve problems. Write out some differences between rates and unit rates.	Continue the lesson, check for understanding, model example rate or ratio problems if students need extra practice. **Writing Prompt** Class constructs an "I Learned/ I Still Don't Understand" chart.	• straight edge • 4-function calculator (optional)	• **BLM** Racing Ratios – Teacher Script Sheet • **BLM** Graph – Teacher Script Sheet • **BLM** Racing Ratios • **BLM** Graph #1 • **BLM** Racing Ratios-Practice Problems (per group) • **BLM** Strategy Worksheet (4 per group) • **BLM** Strategy Worksheet-Graph (4 per group)
Snack Fractions	Use add., sub., mult. and div. to solve problems involving fractions and decimals. Convert between fractions, decimals, whole numbers and percents. Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios). Estimate and find solutions to application problems involving percent.	Explain solution strategies.	Students will work in pairs and explore fraction, decimal, and percent concepts through cutting and fair-sharing an apple.	• 1 large apple • 2 paper dessert plates • 2 paper towels • 2 plastic knives *All items listed above per partner pair*	• **BLM** Apple Snack Fractions

Grades 7-8 Overview

Unit 1, Lesson 2 *Ricardo's Race*

This is a quick snapshot of each of the three math lessons for this unit. For detailed instructions, balanced literacy objectives and enrichment ideas, refer to the complete lesson plans for each lesson.

Lesson Segment	Math Objectives	Language Objectives	Activity	Manipulatives	Supplies
Daily Routine 30 – 45 minutes	Solve word problems using a variety of strategies and defend their strategies. Model and solve 2-step word problems. Compose and decompose values to show a new representation of the value. Find equivalent fractions.	Speak to partners, teacher, and class using vocabulary. Discuss problem solving process and strategies. Explain how they decided to rename the target number.	**Essential:** • Measurement Lab • Solve It! Problems • Fraction Action • *X* Marks the Spot • CGI **Optional:** • Target Number 12 • Graphing • Money Matters	• Cardboard boxes (easy to cut apart such as cereal, shirt, etc.) • ruler	• **BLM** Rectangular Prism-Measurement Lab Record Sheet • scissors • plain paper and pencil • 1" grid paper • **BLM** Solve It! Problem 1-2 • **BLM** Solve It! Problem 3 • **BLM** Fraction Action • **BLM** *X* Marks the Spot • **BLM** Ricardo's Rate
Classroom Lesson 1 – 1.5 hours	Use any strategy to find your personal speed walking unit rate. Compare your personal speed walking rate with Ricardo's rate. Compare your personal speed walking rate with other moving objects.	Explain the strategy used to find your personal speed walking unit rate. Discuss vocabulary words and meanings with peers. Listen to ***Ricardo's Race***. Use a Venn diagram to write out the differences between your life and Ricardo's life.	**Vocabulary** Develop a Visual – Verbal Word Association card for each vocabulary word. **Literature** Venn diagram comparing Ricardo's life to students' lives. **Transition to Math** Students connect ratios and rates to literature read during the Classroom Lesson.		• **BLM** Vocabulary Building: Visual-Verbal Word Association (multiple copies per student) • Interview with Dr. Ricardo Romo • Venn diagram • Author Diane Gonzalez Bertrand reads ***Ricardo's Race (MAS Space)***
Math Lesson 30 minutes	Write rates as ratios *(fractions)* with proper labels.	Write rates and ratios using proper labels. Talk about the differences	**Vocabulary** Use vocabulary pervasively in the lesson, including	• 4-function calculator	None

	Compare rates with unit rates. Draw a visual representation to compare two ratios. Use a pattern to find equivalent ratios. Use cross multiplication to solve for an unknown. Create a graph to solve a rate problem.	between rates, ratios and unit rates. Discuss problem solving strategies with peers. Work with others to solve problems.	literature vocabulary (see suggestions in side bar of lesson). **Mathematics** Explore various strategies for solving problems that deal with rates and unit rates.		
Follow-up Lesson 30 – 45 minutes	Write rates and equalities as ratios with proper labels. Choose an equivalent ratio strategy to solve a ratio problem.	Write rates and ratios using proper labels. Explain your problem solving strategy to peers. Write a description of how a unit rate is more specific than a rate.	Continue the lesson, check for understanding, model example rate problems if students need extra practice. **Writing Prompt** Class constructs an "I Learned/ I Still Don't Understand" chart Add to the chart begun yesterday.	• straight edge • 4-function calculator (optional)	• **BLM** Olympic Problem
Snack Fractions	Use add., sub., mult. and div. to solve problems involving fractions and decimals. Convert between fractions, decimals, whole numbers and percents. Use division to find unit rates and ratios in proportional relationships such as speed, density, price, recipes, and student-teacher ratios. Estimate and find solutions to application problems involving percent.	Discuss fraction comparisons. Discuss fraction equivalencies.	Students will work in pairs and explore fraction, decimal, and percent concepts through cutting and fair-sharing an ice cream sandwich.	• 1 large ice cream sandwich • 2 paper dessert plates • 2 paper towels • 1 plastic knife • 2 pieces wax paper • 2 pair of scissors *All items listed above per partner pair*	• **BLM** Ice Cream Sandwiches

Grades 7-8 Overview

Unit 1, Lesson 3 *Ricardo's Race*

This is a quick snapshot of each of the three math lessons for this unit. For detailed instructions, balanced literacy objectives and enrichment ideas, refer to the complete lesson plans for each lesson.

Lesson Segment	Math Objectives	Language Objectives	Activity	Manipulatives	Supplies
Daily Routine 30 – 45 minutes	Find a pattern using the calendar and list special class events each day. Model and solve situational problems with fractions using pictures, numbers and words. Solve measurement situational problems involving circumference, diameter, height and volume. Solve situational problems involving whole numbers in all operations.	Listen, read, speak, and write the problems. Listen to, read, speak and write math vocabulary. Speak to partners, teacher, and class using vocabulary introduced in the Daily Routines.	**Essential:** • Measurement Lab • Solve It! Problems • Fraction Action • *X* Marks the Spot • CGI **Optional:** • Target Number 24 • Graphing • Money Matters	• cardboard cylinders (easy to cut apart such as cereal, shirt, etc.) • ruler	• **BLM** Cylinder-Measurement Lab Record Sheet • scissors • plain paper and pencil • 1" grid paper • **BLM** Solve It! Partner #1-Problem 4 1 per pair • **BLM** Solve It! Partner #2-Problem 5 1 per pair • **BLM** Fraction Action • **BLM** *X* Marks the Spot
Classroom Lesson 1 – 1.5 hours	Discuss how daily activities use mathematical thinking. Compare student generated measurements.	Read *(out loud)* vocabulary words and food labels. Create sentences using vocabulary words, and read them to your classmates. With peers, write a new vocabulary list from labels. Discuss similarities between Ricardo's life and classmates' lives. Listen to Ricardo's Race and think about his positive choices.	**Vocabulary** Play Hot Potato Find English words on can labels ended by Gallery Walk. **Literature** Revisit the Venn, then list the positive moves Ricardo made in situations comparable to the students. **Transition to Math** Discuss findings from Cylinder-Measurement Lab activity (if completed).		• Word Web technology such as ***Inspirations*** (optional) • Venn diagram from Lesson 2 • ***Ricardo's Race*** by Diane Gonzales Bertrand

Math Lesson 30 minutes	Write rates as ratios with proper labels. Compare rates with unit rates and serving costs. Use patterns to find equivalent ratios. Use cross multiplication to solve for an unknown.	Read food labels and price tags. Discuss problem solving strategies with peers. Write ratios, unit rates and serving costs for food items.	**Vocabulary** Use vocabulary pervasively in the lesson, including literature vocabulary (see suggestions in side bar of lesson). **Mathematics** Find unit rates of comparable products and compare. Find rates per serving suggested on can.	• 4-function calculator	• Grocery bag with 8 pairs of canned vegetables *Pair house-brand and name-brand cans of same soup but different quantity for comparison.
Follow-up Lesson 30 – 45 minutes ***Family Fun *Optional Activity***	Write rates as ratios with proper labels. Compare rates with unit rates and serving costs. Use any strategy to solve serving cost problems.	Share and record can and label data with peers. Write ratios, unit rates and serving costs for food items. Explain problem solving strategy to peers. Explain how finding unit rates can be helpful for you and your family.	Continue the lesson, circulating the room to assure students understand the problems and how to set up ratios. **Writing Prompt** Explain how unit rates can be helpful to you and your family. Add to the chart begun in Lesson 1.	• 4-function calculator • dominoes (1 set per pair + 1 set per student to take home)	• Grocery bags and cans per team from Math Lesson • **BLM** Canned Goods-Record Sheet • **BLM** Family Fun Game Board #1 (per family) • **BLM** Family Fun Materials and Special Instructions Sheet • **BLM** What's In Your Pantry?
Snack Fractions	Use add., sub., mult. and div. to solve problems involving fractions and decimals. Convert between fractions, decimals, whole numbers and percents. Use division to find unit rates and ratios in proportional relationships such as speed, density, price, recipes, and student-teacher ratios. Estimate and find solutions to application problems involving percent.	Discuss fraction comparisons. Discuss fraction equivalencies.	Students will work in pairs and explore fraction, decimal, and percent concepts through cutting and fair-sharing string cheese.	• 5 large string cheese • 4 paper dessert plates • 4 paper towels • 4 plastic knives • 4 pieces wax paper • 4 pairs of scissors *All items listed above per group of 4*	• **BLM** String Cheese-Snack Fractions

Project SMART/Math MATTERS 2014

Grade Level: 7-8	Unit 1 / Lessons 1 – 2 – 3

Daily Routine Math Objectives:
Solve word problems using a variety of strategies and defend their strategies.
Model and solve 2 and 3-step word problems.
Find surface area of rectangular prisms and cylinders.
Compose and decompose values to show a new representation of the value.
Solve problems involving ratios, proportions, and similarity.

Daily Routine Language Objectives:
Listen, read, speak, and write the problem.
Listen to, read, speak and write about measurement vocabulary.
Speak to partners, teacher, and class using vocabulary introduced in the Daily Routines.

Unit Math Objectives:
Connect ratio to multiplication.
Solve single and multi-step problems involving rates of speed, ratios and unit rates (and unit pricing).
Generate equivalent ratios using visualization, estimation, patterns, cross multiplication and graphing to solve problems.
Compare student generated measurements.

Unit Language Objectives:
Read, write and discuss vocabulary words, their meanings and differences.
Read and listen to ***Ricardo's Race***.
Discuss and write varying aspects of ***Ricardo's Race*** and life situations.
Discuss problem solving strategies with peers.
Explain strategies to find equivalent ratios.
Read word problems.
Write rates, ratios and other steps involved in solving problems.

Technology Objectives:
Use research skills and electronic communication, with appropriate supervision, to create new knowledge.

Vocabulary
Math: ratio, equivalent, rate, unit rate
Language: encouraged, disappointed, champion, dedication, mentor

Resources/Literacy Links
Ricardo's Race by Diane Gonzales Bertrand

Lesson Sequence

- Daily Routine: 30 – 45 minutes
- Classroom Lesson: 30 minutes - 1 hour
- Math Lesson: 30 minutes
- Classroom Follow-up including Independent Writing: 30 minutes - 1 hour

Enrichment Activities – These are BEYOND expectation

Math Extensions:

Graph: Birthday graphing idea
Math Walk: Find an area suitable for the speed-walk in Lesson 2.
Graphing Experiences: http://fcit.usf.edu/math/lessons/lessons8.html
Extensions to Ratio Problems: http://math.rice.edu/~lanius/proportions/

Strand Extensions:

Social Studies: Research the Hispanic influence in San Antonio.
http://www.answers.com/topic/san-antonio-history?cat=travel
http://www.sat.lib.tx.us/html/hispanic.htm
http://www.yale.edu/ynhti/curriculum/units/1984/3/84.03.01.x.html (generic -- USA)
http://www.orbitz.com/vacation-info/Texas/San-Antonio.html
http://www.hispanicprwire.com/news.php?l=in&id=8374&cha=13 (Hispanic Media awards)
http://www.hispanicheritage.org/images/press/San%20Antonio%20Press%20Release.pdf Hispanic Heritage Youth Awards 2006
Science: Research safe running habits and develop a plan to help someone form a life habit of running or walking based on safe principles.
http://www.tinajuanfitness.info/articles/art072998.html
http://running.about.com/od/running101/ht/runningsafely.htm
http://www.runtheplanet.com/trainingracing/safety/
http://www.ehow.com/how_14504_trail-run-safely.html
Art: Create a Hispanic art project. Some ideas can be found in these links:
http://www.princetonol.com/groups/iad/Files/mexico.htm
http://www.hispaniconline.com/hh02/education_celeb_hisp_heritage_school_elem.html
Writing Workshop: http://www.hispanicheritage.org/about.php
Read about the Hispanic Heritage Foundation, and the Youth Programs which help Hispanic students enter college. Read some of the information about past awardees. Write a paragraph that describes where you want to be as a high school senior. If you can visualize it, you can achieve it.

Technology:

Math Basic Fact Practice:
Other Subject Integration:
Family Math: http://illuminations.nctm.org/swr/review.asp?SWR=439
Article from PBS on starting a Family Math Night:
http://www.pbs.org/teachersource/whats_new/math/tips0899.shtm
Google Earth – use Google Earth to find Ricardo's neighborhood in San Antonio:
http://earth.google.com/

Unit 1 CGI Problems for *Ricardo's Race*

	Multiplication	**Measurement Division**	**Partitive Division**
Grouping/ Partitioning	Ricardo stacked _____ rows of ____ cans each. How many cans did he stack? (7, 9) (23, 7) (12, 15)	Ricardo had _____ cans that he needed to display in equal rows of ____ cans each. How many rows can he make? (56, 8) (112, 7) (336, 21)	Ricardo had _____ cans that needed to be boxed equally in ____ boxes. How many cans should he put in each box? (49, 7) (288, 12) (216, 9)
Rate	Ricardo ran ___ miles per hour. If he ran a constant rate, how many miles did he run in ____ hours? (15, 3) (12.2, 3) (12 1/2, 3)	Ricardo ran ____ miles per hour. At that rate, how long did it take him to run ____ miles? (15, 45) (12.2, 48.8) (12 1/2, 37 1/2)	Ricardo ran a total of ___ miles in ____ hours. If he ran at a constant speed, how many miles an hour did he run? (45, 3) (48.8, 4) (50, 4)
Price	Ricardo's father sold _____ jars of peanut butter at ____ each. How much did he collect on peanut butter? (15, $.27) (21, $.50) (124, $.75)	Peanut butter costs ____ a jar. How many jars can you purchase for _____? ($.25, $1.50) ($.75, $4.50) ($.95, $5.70)	Ricardo's father bought _____ jars of peanut butter for which he paid a total of _____. If each jar cost the same, what did he pay per jar? (12, $3.00) (24, $18.00) (36, $45.00)

Unidad 1 Problemas CGI para *La carrera de Ricardo* 

	Multiplicación	**División para medir**	**División partitiva**
Agrupar/Separar	Ricardo hizo _____ filas de ____ latas cada una. ¿Cuántas latas puso en las filas? (7, 9) (23, 7) (12, 15)	Ricardo tenía _____ latas que necesitaba exhibir en filas iguales de ____ latas cada fila. ¿Cuántas filas puede hacer? (56, 8) (112, 7) (336, 21)	Ricardo tenía _____ latas que necesitaba poner en cantidades iguales en ____ cajas. ¿Cuántas latas debe poner en cada caja? (49, 7) (288, 12) (216, 9)
Velocidad	Ricardo corrió ___ millas por hora. Si corrió a una velocidad constante, ¿cuántas millas corrió en ____ horas? (15, 3) (12.2, 3) (12 1/2, 3)	Ricardo corrió ____ millas por hora. A esa velocidad, ¿cuánto tardó para correr ____ millas? (15, 45) (12.2, 48.8) (12 1/2, 37 1/2)	Ricardo corrió un total de ___ millas en ____ horas. Si corrió a una velocidad constante, ¿cuántas millas por hora corrió? (45, 3) (48.8, 4) (50, 4)
Precio	El papá de Ricardo vendió _____ frascos de crema de cacahuate a ____ cada uno. ¿Cuánto dinero recibió por venta de crema de cacahuate? (15, $.27) (21, $.50) (124, $.75)	La crema de cacahuate cuesta ____ por frasco. ¿Cuántos frascos puedes comprar con _____? ($.25, $1.50) ($.75, $4.50) ($.95, $5.70)	El papá de Ricardo compró _____ frascos de crema de cacahuate y pagó un total de _____. Si todos los frascos cuestan lo mismo, ¿cuánto pagó por cada frasco? (12, $3.00) (24, $18.00) (36, $45.00)

Materials
- Pre-assessment

Math Objectives
- Pre-assess summer skills.

Language Objectives
- Pre-assess summer skills.

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
encouraged
disappointed
champion
dedication
mentor

TEKS (*denotes Texas Essential Knowledge and Skills that are taught in this unit)*
7th 7.
8th 8**.**

ELPS (English Language Proficiency Standards - TX)
2C, 2E, 3D, 3E, 4F

Assessment Items
(As a result of experiencing this unit, students will learn skills necessary to be successful on the following Assessment items.)

1 (ratio - Math Lesson)
4 (ratio perspective - Math Lesson)
5 (ratio perspective- Math Lesson)
6 (rate - CGI)
7 (unit rate - CGI)

Unit 1, Lesson 1 — Grades 7-8

Daily Routine

Pre-assessment – The Daily Routines have been omitted to accommodate the administration of this tool. Please be sure to give the assessment as per the instructions under the Assessment Tab in your Teacher's Guide.

The following daily activities will help prepare your students for the Post-assessment. They are not optional.

ESSENTIAL

Measurement Lab:
- **Lesson 1 – omit**
- Lesson 2 – Find area of faces & surface area of rectangular prisms.
- Lesson 3 – Find area of parts and surface area of cylinders.

Solve It! Multi-step problem solving
- **Lesson 1 – omit**
- Lesson 2 – partners, 2-step problem
- Lesson 3 – partners, 2-step problem

Fraction Action
- **Lesson 1 – omit**
- Lesson 2 – BLM Fraction Action and X marks the Spot
- Lesson 3 – BLM Fraction Action and X marks the Spot

***X* Marks the Spot**
- **Lesson 1 – omit**
- Lesson 2 – BLM Fraction Action and X marks the Spot
- Lesson 3 – BLM Fraction Action and X marks the Spot

CGI
- **Lesson 1 – omit**
- Lesson 2 – Rate (assessment item 7)
- Lesson 3 – Price (assessment item 6)

	Unit 1, Lesson 1 **Grades 7-8** **Daily Routine** - continued  **----------** **The following activities, although certainly developmentally appropriate for your 7th and 8th grade students, do not specifically address objectives assessed on the Post-assessment. Schools with shorter teaching spans can consider omitting some or all of these activities as your time permits.** **----------** **OPTIONAL** **Target Number** • **Lesson 1 – omit** • Lesson 2 – Target Number 12 • Lesson 3 – Target Number 24 **Money Matters** (*If you have a full program and wish to use this optional activity, you will find BLMs and Explanations in the Optional Activities Tab of your Teacher's Guide*.)

- **Genre: Informational Text (explanatory paragraph)**

- **Writing Objective:** Students write an informational text that explains a goal they have for their future, and how they plan to reach that goal.

- **Organization of text:**
  This text could be written as one paragraph, or elaborated into multiple paragraphs.
  - Introductory sentence that explains their goal (or an introductory paragraph).
  - Sentences explaining how they plan to reach their goal. (Or, different paragraphs explaining each part of their plan.)
  - Concluding sentence (or a concluding paragraph).

- **Possible sequence of mini-lessons:**
  Brainstorm: Remind students of how Ricardo set an important goal for his future, and then made a plan to work towards it. Show students the following "Boxes and Bullets" graphic organizer, which is helpful for organizing a main idea and details:

  Ricardo wanted to get an athletic scholarship to go to college.

  - He trained every day for running.
  - He took more academic classes.
  - He planned ahead to have time to train, work at the family store, and study.

  Have students discuss what goals they could have for the future. Create a class list of possibilities, and help students visualize possibilities they might not have considered. Once students have brainstormed with you, have them complete their own "Boxes and Bullets" graphic organizer as a plan for their writing. Circulate and assist students as needed to help them brainstorm goals and a plan to reach that goal.

  To help your students think about goals for their future, you can have them read about the Hispanic Heritage Foundation and the Youth Programs, which help Hispanic students enter college. They can read some of the information about past awardees. http://www.hispanicheritage.org/about.php

  Draft: Model for students how to use the Boxes and Bullets graphic organizer to write an informational text:
  - The sentence in the box becomes part of their introductory statement.
  - The bullets each become elaborated sentences (or paragraphs) explaining how they want to reach their goal.
  - The sentence in the box becomes part of their concluding statement.

  Focus on showing students how to organize their writing with an introductory statement about their goal, sentences that explain how to reach the goal, and a concluding statement. Then, provide time for students to write their informational texts.

  Revise: Model how students can elaborate their writing by including personal stories to illustrate why they chose that particular goal, or particular parts of their plan. When students are writing independently, circulate and ask students where they think they could add more detail to their writing.

  Publish: If time permits, have students publish their writing on the last day. This should include a final version of their informational text, and if you wish, a drawing of the timeline of their own life with key events that have led up to them setting that particular goal.

Materials
(BLM denotes blackline masters provided in the curriculum)

- ***Ricardo's Race*** by Diane Gonzales Bertrand
- Word Web technology such as ***Inspirations*** (optional)
- **BLM** Vocabulary word cards (class set)
- Webbing instrument such as Inspirations or other tool for creating webs
- Individual student journals
- Richard Romo – picture and bio: http://www.utsa.edu/president/ http://www.utsa.edu/president/Biography.html

Literature Selection
Ricardo's Race
La carrera de Ricardo
by Diane Gonzales Bertrand

Math Vocabulary
ratio
equivalent
rate
unit rate
Literature Vocabulary
encouraged
disappointed
champion
dedication
mentor

Technology Option
If you have a

Unit 1, Lesson 1 — Grades 7-8

Classroom Lesson

Every day teachers must post the objectives on the board, read them to the students, and have students read them together with the teacher. At the end of the lesson, teacher and students should review to see if they have accomplished both math and language objectives.

Math Objectives:

- Compare rates of speed and unit rates from previous life experiences.

Reading Objective:

- Understand a biography by pausing to think about details, and inferring what they author is really trying to say.

Language Objectives:

- Discuss attributes *(characteristics)* of champions.
- Write words that describe attributes of champions and strategically place them on a Word Web.
- Discuss and write vocabulary words from ***Ricardo's Race***.

BEFORE READING

Building Background – Literature & Vocabulary

Show the cover of the book to the class and read aloud the title. Ask students whether they think this book could be fictional or factual and to explain their reasoning. *(It could be either.)*

This is a real person who grew up in San Antonio, TX.

Ask students: Since this book is about the life of a real person, what genre would it be? *(Biography)* Explain that a biography is narrative nonfiction:

- Narrative: because it tells a story
- Nonfiction: because the story is about the real events from a real person's life.

Ask students: Have you ever been to San Antonio? What did you see and do? What did you notice about the city?

Attribute Chart activity

Create the following attribute chart for the whole class to see.

Tell students: All of these words are adjectives to describe characteristics (or attributes) of people. From what you see on the cover of this book, and from what you've see on the Ricardo Romo website, which of these adjectives do you think could describe Ricardo in this biography? Talk with your partner.

Unit 1, Lesson 1
Classroom Lesson

Grades 7-8

Technology Option
If you have a projector or Smart Board, you can create the diagram using Inspiration software. Allow students to take turns adding concepts to the web.

	Attributes						
	dedicated	**rude**	**disappointed**	**motivated**	**lazy**	**encouraged**	**hard working**
Ricardo							

Regroup the class, and for each adjective, call on a student to explain whether or not they think the adjective describes Ricardo. **Use this discussion to explain the meaning of words as necessary.** The words *dedicated*, *disappointed*, and *encouraged* are related to vocabulary words for this selection, so make sure you reinforce their meanings during this time.

	Attributes						
	dedicated	**rude**	**disappointed**	**motivated**	**lazy**	**encouraged**	**hard working**
Ricardo	**x**			**x**		**x**	**x**

Put marks under the attributes the class predicts will describe Ricardo. For example, at the end of the discussion your chart might look like this:

It doesn't matter if students' predictions are correct or not. After you read aloud this biography, students will revisit the chart and revise their predictions based on what they learned. In this example, students did not predict that Ricardo was *disappointed*. However, after hearing this read aloud they will have learned that Ricardo felt disappointed several times in his life. Champions have to learn how to use their disappointment as a motivation to work harder.

Genre Investigation: Bio
Teach a mini-unit on biography as a literary genre. Here are some ideas that can be adapted to this book: http://www.readwritethink.org/classroom-resources/grade/7-8/

Timeline activity
In order to understand this biography, students need to know the terminology for the levels of schooling:

- Elementary school
- Middle school
- High school (college prep or "Tech")
- College/University: Undergraduate
  - Freshman
  - Sophomore
  - Junior
  - Senior
- College/University: Graduate
  - Masters
  - Doctorate

To introduce this vocabulary in a meaningful way, show students the beginnings of a timeline you have prepared *(see BLM of Timeline)*. This timeline only has dates on it so far, and underneath the dates it shows what years in Ricardo's life correspond to the different types of schooling he went through.

Role Models
Discuss role models. How do role models help us all to set and achieve goals? Who were the role models for Ricardo? Who are student's role models and how are they helping students make and achieve personal goals?

Personal Goals
What are students' individual goals? What will it take to achieve them? Who are role models in their lives?

Use this timeline to explain the above terminology about schooling.

Tell students that as you read the biography, you will add key events from Ricardo's life onto the timeline. Explain that you have these key events written on small sticky notes, and that you will pass them out to different students. When students hear the event written on their sticky note, they should wave the sticky note in the air, and you will have them come up to add it to the timeline.

Note: There are 15 sticky notes. If you have more students, simply make duplicates of certain sticky notes, so that two students are listening for those particular events. If you have less students, give the students with the strongest English proficiency two sticky notes to listen for.

Events to write on small sticky notes:

- Ricardo first helped his dad in their store.
- Ricardo went to first grade and learned English.
- Ricardo's father entrusted him to lock up the store for the first time.
- Ricardo started training with Coach Davis for running.
- The school counselor told Ricardo he should go to Tech instead of a college prep high school.
- Ricardo set an important goal to be the fastest runner in the state.
- Ricardo realized that running could earn him an athletic scholarship.
- Ricardo began taking academic classes like English, history, math, and science to prepare for college.
- Ricardo won the state championship, but still helped his parents at the store.
- Ricardo went to University of Texas in Austin with an athletic scholarship.
- Ricardo became the first Texan to run a mile in less than 4 minutes, and began to dream about competing in the 1968 Olympics.
- Ricardo married Harriet, who he met at college.
- Ricardo moved to California. He taught history and began a graduate program.
- Ricardo finished a doctorate degree in United States History.
- Ricardo became president of University of Texas in San Antonio.

DURING READING

Comprehensible Input – Literature and Vocabulary

During this first reading, the goal is to support students' comprehension of the text by modeling and practicing three reading strategies:

- **Monitoring for Comprehension**
- **Determining Word Meaning**
- **Inferring** *(Ricardo's attributes, based on text evidence)*

Classroom Lesson - continued

This section indicates places in the text where you can:

- Briefly pause to model a reading strategy by thinking aloud.
- Briefly pause to have students practice a reading strategy by answering a question you pose.

Keep in mind that pausing the reading for too long at any of these places will make the reading very disconnected. This interferes with students' comprehension and enjoyment of the text, so keep the reading as fast-paced as possible.

Note: This text doesn't have page numbers; the page count begins on the first page with text, and the first words on that page are provided as an indicator.

You may want to mark the following stopping points in the text with sticky notes, indicating what you will say to students.

Throughout the Reading:
Monitoring for Comprehension
Have students raise their sticky notes when they hear the key events you passed out to them. Have students put the sticky note on the timeline in the correct place. You may need to reread part of the text surrounding that event to help them find the clues that let them know when the event took place. Some of the phrases in this text that give clues about sequencing are:

- Ricardo was five years old when…
- By 2nd grade…
- When Ricardo turned twelve…
- As a 7th grader…
- At Tech…
- For the rest of high school…
- As a freshman…
- In 1966…

p. 1 "Ricardo Romo never dreamed…" (After reading this page)
Monitoring for Comprehension

- Teacher Think Aloud: Hmm, I wonder what the author means with all of these questions. They must be giving us clues about events that were important in Ricardo's life. We'll have to watch for parts in the biography that explain these questions.

p. 5 "As a child, Ricardo only spoke Spanish…" (After the part about reading can labels)
Monitoring for Comprehension

- Teacher Think Aloud: Ah ha! So reading labels on cans made him a better student because it helped him learn how to read in English and spell words. That explains one of the questions from the first page.

p. 7 "In Ricardo's family, . . ." (After reading the part about sweeping)
Monitoring for Comprehension

- Teacher Question: So how did sweeping floors teach Ricardo about teamwork? Talk with your partner.

p. 9 "As a seventh grader…" (After reading this page)
Determining Word Meaning

- Teacher Question: What do you think the word *encouraged* means? Let me reread those last few sentences to see if there are any clues. *(Reread the last two sentences.)* Talk with your partner – what do you think *encouraged* means?
- Help students see that *encouraged* is something people do to help others get through a hard or difficult time. What are some ways the coach might have encouraged Ricardo? For example, telling him, "You can do it!" or "Your running time is improving. Keep up the good work!"

p. 11 "One day the school counselor…"
(After reading the word *disappointed*)
Determining Word Meaning

- Teacher Think Aloud: Oh! Here it says he felt disappointed. That's one of the words on our chart. Did any of you predict he would feel disappointed in his life?

(After reading the rest of the page.)
Inferring

- Teacher Question: In this part, it says that the school counselor shook her head and said, "That's not a school for kids who can go to college. Why don't you go to Tech instead? You need to learn a trade for a job." What was the school counselor *really* thinking about Ricardo? Talk with your partner.

p. 25 "As a teacher and historian…" (After reading this page)
Determining Word Meaning

- Teacher Question: What do you think the word *mentored* means? Let me reread that sentence to you. *(Reread.)* Talk with your partner.
- Help students see that the clue is in the phrase that comes after the word: "preparing them to teach and work in their communities."

p. 27 "Since moving back to Texas…" (After reading this page)
Inferring

- Teacher Question: What kind of race is Ricardo in now? Talk with your partner.

Monitoring for Comprehension

- Teacher Question: Let's look back at that first page and see if it makes more sense now. *Reread the first page.* So, how did running for the bus get Ricardo into college?

AFTER READING

Practice and Application – Literature and Vocabulary

Attribute Chart

Have the class look back at the chart where they made predictions about the adjectives they thought would describe Ricardo. For each adjective, have students talk with their partner about whether it describes Ricardo in the book, and if it does, what evidence from the text shows that? Being able to provide specific examples to support an inference is a critical thinking skill that students need to develop.
For example, if the chart below showed the predictions students made, you might say:

Teacher: You predicted that Ricardo is dedicated. Do you still think so? *Elicit responses from the class.*
Teacher: What evidence from the text tells you that he is dedicated? Talk with your partner. *Regroup class and have several students share. Repeat this for the other adjectives.*

	Attributes						
	dedicated	**rude**	**disappointed**	**motivated**	**lazy**	**encouraged**	**hard working**
Ricardo	**x**			**x**		**x**	**x**

ELLs: It is helpful to provide a sentence stem for this discussion:
"I think Ricardo is dedicated because…"
Write the sentence starter in a place where the class can see it during their partner discussion.

Note: To practice the vocabulary word *champion*, you can talk with the class about how these are adjectives that describe a champion. Change the title of the chart to say **"Attributes of a Champion."**

Transition to Math

Building Background - Math

In 1966, Ricardo became the first Texan to run a mile in less than four minutes.

This is a rate of speed. One mile per four minutes. What other rates of speed can students recall? Write their ideas on the board. Here are some in case you need to get the ball rolling. Record all of their suggestions. Maybe they remember some of the rates from last summer's readings? Use what they know.

55 miles per hour (some highways)
35 miles per hour (some city streets)
20 miles per hour (some school zones)

Students will use their knowledge of rates of speed today. The above examples are UNIT RATES because they are the rate per a single unit, in this case one hour *(notice that the one mile per four minutes is NOT a unit rate)*. Students will need this knowledge for the TV Lesson.

Classroom Lesson - continued

Objectives

Review both language and math objectives, making sure students understand how they accomplished each.

Duplicate on cardstock and cut apart for word cards.

encourage

disappointed

champion

mentor

Duplicate on cardstock and cut apart for word cards.

dedication

dedicatoria

animar

Duplicate on cardstock and cut apart for word cards.

decepcionado/a
campeón
mentor

Materials
(BLM denotes blackline masters provided in the curriculum)
- **BLM** Rate Chart
- **BLM** Ricardo's Rate
- **BLM** Grid
- Straight edge
- 4-function calculator (optional)

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
encouraged
disappointed
champion
dedication
mentor

ELPS (*English Language Proficiency Standards*
3D, 3J, 5B

ELPS (*English Language Proficiency Standards*
3D, 3J, 5B

Instructional Note
The horizontal fraction bar is read as "per." Write "per" beside the bar.

Unit 1, Lesson 1 — Grades 7-8

Math Lesson

Math Objectives:
- Write rates as ratios *(fractions)* with proper labels.
- Compare rates with unit rates.
- Draw a visual representation to compare two ratios.
- Use a pattern to find equivalent ratios.
- Use cross multiplication to solve for an unknown.
- Create a graph to solve a rate problem.

Language Objectives:
- Write rates and ratios using proper labels.
- Talk about the differences between rates, ratios and unit rates.
- Discuss problem solving strategies with peers.
- Work with others to solve problems.

Building Background
Read and have students read with you a second time, the Math and Language Objectives for this portion of the lesson.

Students will work with unit rates of speed today – how fast did something move per one unit of measure.

For example, 55 miles per hour tells us that a vehicle moves 55 miles per ONE hour, or every hour. One hour is a single unit.

Comprehensible Input
Show students RATE chart (BLM)

- **80 miles per hour** *(rate of speed on Texas highways in a very low-population area, particularly West Texas)*
- **75 miles per hour** *(rate of speed on Texas highways in a low-population area, such as West Texas and parts of the Rio Grande Valley and Laredo area)*
- **70 miles per hour** *(rate of speed on most Texas highways)*
- **55 miles per hour** *(rate of speed on Texas highways other than Interstates, which are close to cities and towns)*
- **35 miles per hour** *(rate of speed in many Texas cities)*
- **20 miles per hour** *(rate of speed in many Texas school zones)*

Show one of these rates as a ratio, explaining that these are ratios and can be expressed in fractional form:

Example: $\frac{80 \text{ miles}}{1 \text{ hour}}$ **per**

Ask students to write this ratio, labeling the parts as in your example.

Read the next rate from the list and ask students to write the ratio as a fraction, labeling as you did in the example. Then write the ratio as a fraction, reading and labeling just as you did in the example. Continue in this manner for all of the ratios on your list.

Tell the students again that these are UNIT RATES because each shows how fast something is traveling in ONE UNIT of measure *(circle one hour on each of your ratios).*

What do you notice about all of the fractions? *(The denominators are all ONE. That's how we recognize a unit rate. All have denominators of one.)*

Not all rates are UNIT RATES. For example, Ricardo was the first Texan to run the mile in less than four minutes. Just taking four minutes as the unit of measure, Ricardo could run a mile per four minutes. 1 mile per 4 minutes. Write that as a fraction.

That looks like this as a ratio: $\frac{1 \text{ mile}}{4 \text{ minutes}}$ **per**

Ask students to compare how this ratio looks and how the other ratios look. What is different? *(Give them a brief time to talk to one another.)*

Circle the four. Tell students that this is not a SINGLE unit of measure. It is not ONE. All of the other ratios were in single units – ONE—of some measure.

So the question is if Ricardo could run one mile in four minutes, how far could he run in ONE minute? **What strategy would you use to solve that problem?**

One strategy would be to find EQUIVALENT RATIOS. In their fraction lesson this morning, students were finding EQUIVALENT FRACTIONS. They can use the same process to find EQUIVALENT RATIOS.

You know what Ricardo can run in 4 minutes: $\frac{1 \text{ mile}}{4 \text{ minutes}}$ **per**

Math Lesson - continued

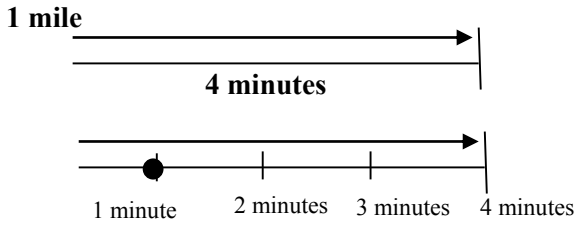
What you want to know is how far he can run in one minute. In other words, **?** miles per one minute. Instead of the question mark, use a variable. It can be any letter, but let's use "x."

x miles per one-minute. Write that ratio as a fraction.

Example: $\frac{\text{x mile}}{\text{1 minute}}$ **per**

First, stop to think about the problem. **If Ricardo can run one mile in four minutes, will he run more than a mile or less than a mile in one-minute? Why?** Allow time for students to converse between themselves and the whole group.

To explain, draw a line to represent one mile, and label the end four minutes.



He would run less than one mile in one minute. **But what part of a mile would he run?** Have students talk about the visual in their class.

If the whole line represents one mile, I've divided the line into four parts: 1 mile divided by 4 = one-fourth mile segments. $\frac{1}{4}$ mile + $\frac{1}{4}$ mile + $\frac{1}{4}$ mile + $\frac{1}{4}$ mile = 1 whole mile.

But the line also represents the time – 4 minutes. So **if the line represents 4 minutes, and I've divided that line into 4 equal parts, what does each part represent?** ***(pause)***

4 minutes ÷ into 4 parts = 1 minute for each part. This model shows us that Ricardo ran one-fourth mile in one minute.

Now we have visualized a reasonable answer to our question. Let's use what we know about EQUIVALENT FRACTIONS to help us find this answer arithmetically.

Technology Option

Students can use a graphing calculator to solve this and other problems graphically.

Math Lesson - continued

Write the two ratios. You are going to assume that his rate of speed does not change, so the two rates should be equivalent.

$$\text{per}\ \frac{1 \text{ mile}}{4 \text{ minutes}} = \frac{¼ \text{ mile}}{1 \text{ minute}}\ \text{per}$$

Let's look at our data. If these are equivalent ratios, then the relationship between the numerator and denominator should be the same in each ratio.

What is the relationship between the numerator and denominator of our known ratio 1 mile per 4 minutes? The numerator is one-fourth the denominator. 4 (denominator) divided by 4 (relationship) = 1 (numerator)

Look at the new ratio we found with our model $\frac{1}{4}$ mile per 1 minute. There should be the same relationship -- the numerator should be one-fourth the denominator. **Is that true?** Yes. If I divide 1 (denominator) into 4 equal parts (relationship) my answer is one-fourth (numerator).

There are many ways to solve this problem. We've used two ways so far – we drew a picture, using a line or linear model; then we looked for a pattern in the relationship between the numerator and the denominator of the given ratio to find the unknown ratio.

Another common method is to use CROSS MULTIPLICATION. Let's go back to our original known rate 1 mile per 4 minutes and write that as a fraction.

Now, we want to find the number of miles, we'll represent that with *x*, per ONE minute because we want a unit rate, or denominator of one.

Just first multiply one denominator across to the OTHER numerator.

$$\frac{1 \text{ mile}}{4 \text{ minutes}} = \frac{¼ \text{ mile}}{1 \text{ minute}}$$

Then multiply the other denominator across to the opposite numerator.

$$\frac{1 \text{ mile}}{4 \text{ minutes}} = \frac{¼ \text{ mile}}{1 \text{ minute}}$$

Math Lesson - continued

Now… $4x = 1$ Solve for x.

If I want to isolate x, I have to divide by four. And whatever I do to one side of the equation I have to do to the other side of the equation to keep the two sides equal.

$$x = \frac{1}{4}$$

I could also graph this relationship to solve the problem. *(Use the grid BLM.)*

The distance Ricardo ran depends upon how long he runs. So TIME is the x or independent axis and DISTANCE is the y or dependent axis. Have students label the axes.

Now plot the points (0, 0) because if Ricardo doesn't run, he won't move any distance in the running race. Then plot (4 minutes, 1 mile); because if he runs for four-minutes, he will travel one mile. Draw the line connecting the dots. If Ricardo runs at the same rate, he will travel along this line. Now use the one-minute to find the distance. The coordinate will be $(1, \frac{1}{4})$, time one-minute, distance $\frac{1}{4}$ mile.

During the Follow-up Lesson, students will be solving rate problems in the same fashion.

We found the unit rate ratio four different ways:

- we visualized it in our line model;
- we looked for a relationship in the known rate which would help us find the unit rate;
- we set up equivalent ratios, using x as the unknown distance in our numerator of the unit rate;
- and we graphed the known ratio, drew a line and found the unit rate.

All four times we found that Ricardo ran one-fourth mile in one minute. That's pretty fast!! I wonder how that compares to how fast you can run…

MAS Space

Introduce students to MAS Space online. Explain that this is a place they can go to complete the MAS Space specific activities and get individualized help with math questions related to the lessons.

	Unit 1, Lesson 1 **Grades 7-8** **Math Lesson** - continued  --- Tell us about your class. Write a class paragraph that tells us: • where you go to school • your teacher's name and your names • something about the weather where you live now • what crops are growing in the fields • what you love about math • what is still confusing about math. • Work as a class to create a word problem using vocabulary from the literature book. **Objectives:** Read through the math and language objectives, making sure that students understand how they accomplished each.

Duplicate on cardstock and cut apart for word cards.

ratio

equivalent

rate

unit rate

Duplicate on cardstock and cut apart for word cards.

proporción

equivalente

razón

razón de unidad

One Teacher Transparency
One per student

Rate Chart

Rate	Use
80 miles per hour	(rate of speed on Texas highways in a very low-population area, particularly West Texas)
75 miles per hour	(rate of speed on Texas highways in a low-population area, such as West Texas and parts of the Rio Grande Valley and Laredo area)
70 miles per hour	(rate of speed on most Texas highways)
55 miles per hour	(rate of speed on Texas highways other than Interstates, which are close to cities and towns)
35 miles per hour	(rate of speed in many Texas cities)
20 miles per hour	(rate of speed in many Texas school zones)

One per student

Ricardo's Rate

Ricardo was the first Texan who ran 1 mile in less than 4 minutes. Using a rate of 1 mile per 4 minutes, what is the distance he would travel in 1 minute?

Visualize a reasonable answer.

Use the patterns of equivalent ratios to solve the problem.

Use cross multiplication to solve the problem.

La razón de Ricardo

Ricardo fue el primer texano que corrió 1 milla en menos de 4 minutos.

Usando una velocidad de 1 milla en 4 minutos, ¿qué distancia recorrería en un minuto?

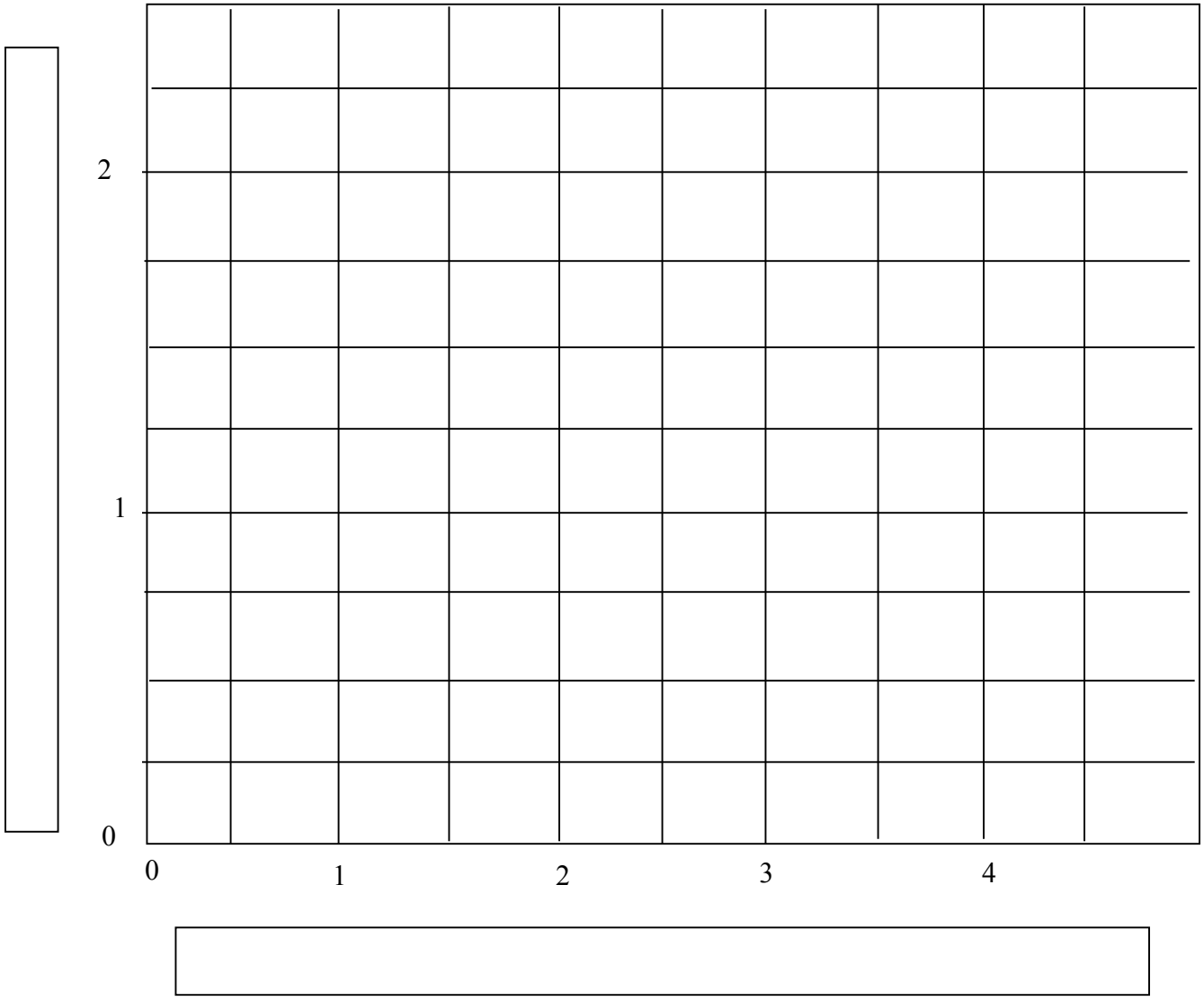
Visualiza una respuesta razonable.

Usa los patrones de razones equivalentes para resolver el problema.

Usa la multiplicación cruzada para resolver el problema.

Unit 1 Lesson 1 – Math Lesson

One per student
One Teacher Transparency



Materials
(BLM denotes blackline masters provided in the curriculum)
- Racing Ratios – Teacher Script Sheet
- Graph – Teacher Script Sheet
- **BLM** Racing Ratios
- **BLM** Graph #1
- **BLM** Racing Ratios-Practice Problems
- **BLM** Strategy Worksheet
- **BLM** Strategy Worksheet-Graph
- Straight edge
- 4-function calculator (optional)

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
encouraged
disappointed
champion
dedication
mentor

ELPS (*English Language Proficiency Standards – TX)*
2E, 2G, 3D, 3E, 3H, 4F, 5G

Technology Option
If you have a projector or Smart Board, you can use an online graphing calculator to model how to solve these problems.
http://www.coolmath.com/graphit/index.html

Unit 1, Lesson 1 — Grades 7-8

Follow-up

Math Objectives
- Write rates as ratios (fractions) with proper labels.
- Compare rates with unit rates.
- Draw a visual representation to compare two ratios.
- Use a pattern to find equivalent ratios.
- Use cross multiplication to solve for an unknown.
- Create a graph to solve a rate problem.

Language Objectives
- Write rates and ratios using proper labels.
- Talk about the differences between rates, ratios and unit rates.
- Discuss problem solving strategies with peers.
- Work with others to solve problems.
- Write out some differences between rates and unit rates.

Practice and Application
The Classroom Teacher should repeat the same process as the Math Lesson format. Use the Teacher's Guided Example for your script if you'd like. Students should have a copy of the Racing Ratio Example and the Racing Ratio Problems. Walk through the example with the students, and then let them work comfortably in pairs or small groups to solve the other four problems.

QUESTIONS
- Is this ratio a UNIT RATE? How do you know?
- Explain how you are finding the EQUIVALENT RATIO.
- How does the graph help you solve the problem?
- What did you visualize when you first looked at the problem to estimate a reasonable answer?
- Which method of solving for equivalent ratios do you prefer? Why?

Recursive Review
None for today

Writing Topics
Independent Writing Topic
Students will have a daily writing activity which will incorporate the day's focus math vocabulary.

- Explain how a UNIT RATE can differ from a RATE.

Unit 1, Lesson 1 — Grades 7-8

Follow-up - continued

Class Writing Topic

- I Learned/ I Still Don't Understand Chart

Write these two stems on chart paper. Students should reflect for a few minutes before responding. Let the students respond first in small groups, then share their group's responses to the large group. Teacher or volunteer student may record responses on the chart. Return to this every day to see how many of the "I still don't understand" statements move to the left by the end of the week.

Today I learned . . .	I still don't understand . . .

Objectives

Review the math and language objectives to make sure that they were accomplished and that the students realize how they were accomplished.

Racing Ratios - *TEACHER SCRIPT SHEET*

Ricardo Romo was the first Texan who ran 1 mile in less than 4 minutes. Using a rate of 1 mile per 4 minutes, what is the distance he would travel in 2 minutes?

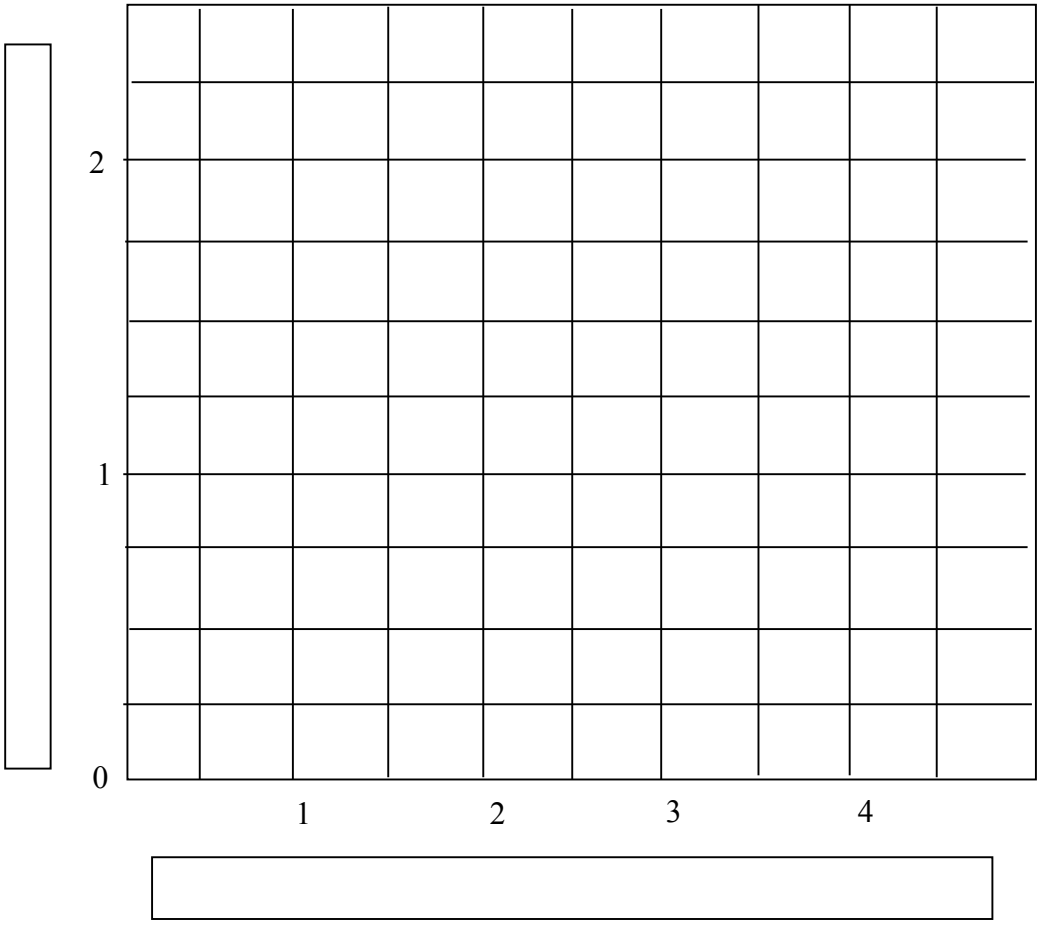
Visualize a reasonable answer. *How did we visualize this in the math lesson? We drew a line that represented the original ratio (draw the line for the students, labeling it as you did in the math lesson). Then alter the line to match the second ratio. You actually solved the problem using this strategy, but you could have simply estimated the solution.*

Use the patterns of equivalent ratios to solve the problem. *Look at the original ratio. What is the relationship between the numerator and denominator? If the rate does not change, then the new ratio must have the same relationship.*

Use cross multiplication to solve the problem. *Multiply across, denominator to numerator, then solve for the unknown.*

Graph - *TEACHER SCRIPT SHEET*

The most important steps you take in using graphing as your solution strategy are: 1) identifying the dependent and independent factors; 2) then deciding on appropriate scales for each axis. We know that how far Ricardo ran depended on the time that he ran. So DISTANCE is dependent (y) and TIME is independent (x). Scale: We know that the greatest distance in this problem is one mile, and from our patterning, we can pretty well tell that we need quarter increments. The greatest TIME is 4 minutes, so we can spread that out evenly across the x axis.



We can plot our beginning point at (0, 0) because if he wasn't running, he didn't cover any distance in the race. The second point is (4, 1) because in 4 minutes he could cover 1 mile. Now all we have to do is to plot the point for the solution ratio.

We are given the time of 2 minutes. So, I need to find the y along this line for 2 minutes. Here it is halfway between 0 and 1 on the y axis. So in 2 minutes, Ricardo could run half a mile. The ratio then is $\frac{1}{2}$ to 2.

Unit 1 Lesson 1 – Follow-up

One per student - *Copy the Graph #1 on the back of this sheet if possible.*

Racing Ratios

Ricardo Romo was the first Texan who ran 1 mile in less than 4 minutes. Using a rate of 1 mile per 4 minutes, what is the distance he would travel in 2 minutes?

Visualize a reasonable answer.

Use the patterns of equivalent ratios to solve the problem.

Use cross multiplication to solve the problem.

Unit 1 Lesson 1 – Math Lesson
One per student

La razón de Ricardo

Ricardo fue el primer texano que corrió 1 milla en menos de 4 minutos.

Usando una velocidad de 1 milla en 4 minutos, ¿qué distancia recorrería en un minuto?

Visualiza una respuesta razonable.

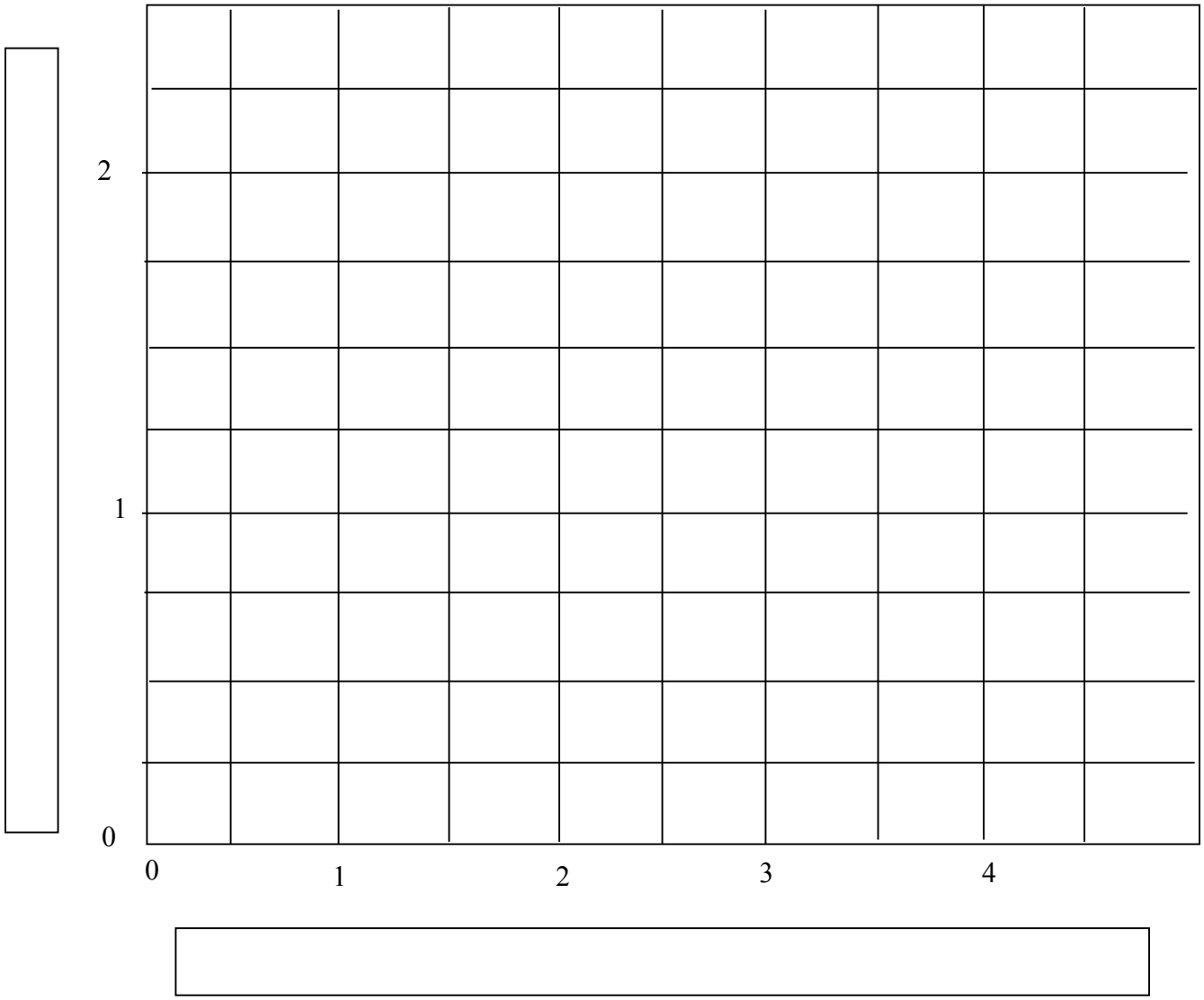
Usa los patrones de razones equivalentes para resolver el problema.

Usa la multiplicación cruzada para resolver el problema.

Unit 1 Lesson 1 – Follow-up

One per student
One teacher transparency

Graph #1



Unit 1 Lesson 1 – Follow-up

One per group

Racing Ratios – Practice Problems

Work cooperatively with a partner or small group to solve the next four problems using all of the strategies we used today. Your teacher will provide you with one Strategy Worksheet for each problem. For the graphing strategy, you will need to set up the graph with appropriate scales for the independent and dependent axis.

1. Ricardo Romo was the first Texan who ran 1 mile in less than 4 minutes. Using a rate of 1 mile per 4 minutes, what is the distance he would travel in 8 minutes?

2. Using a rate of 1 mile per 4 minutes, how long would it take Ricardo to run 3 miles?

3. Using a rate of 1 mile per 4 minutes, how long would it take Ricardo to run 5 miles?

4. Suppose Ricardo could run 1 mile in 3 minutes. At that rate, how long would it take him to run 5 miles?

Unit 1 Lesson 1 – Follow-up

One per group

Racing Ratios – Practice Problems

Trabaja con un compañero o grupo pequeño para resolver los siguientes cuatro problemas usando todas las estrategias que usamos hoy. Tu maestro(a) te proveerá una hoja de estrategias para cada problema. Para la estrategia usando una gráfica, necesitarás preparar la gráfica con las escalas apropiadas en el eje independiente y el eje dependiente.

1. Ricardo Romo fue el primer texano que corrió 1 milla en menos de 4 minutos. Usando una velocidad de 1 milla en 4 minutos, ¿cuál es la distancia que recorrería en 8 minutos?

2. Usando una velocidad de 1 milla en 4 minutos, ¿cuánto le tomaría a Ricardo correr 3 millas?

3. Usando una velocidad de 1 milla por 4 minutos, ¿cuánto le tomaría a Ricardo correr 5 millas?

4. Supón que Ricardo puede correr 1 milla en 3 minutos. A esa velocidad, ¿cuánto le tomaría a Ricardo correr 5 millas?

Unit 1 Lesson 1 – Follow-up

Four per group *Copy the graph on the back of this sheet if possible.*

Strategy Worksheet

Write the word problem in the box below.

Visualize a reasonable answer.

Use the patterns of equivalent ratios to solve the problem.

Use cross multiplication to solve the problem.

Unit 1 Lesson 1 – Follow-up

Four per group *Copy the graph on the back of this sheet if possible.*

Strategy Worksheet

ESCRIBAN EL PROBLEMA EN EL SIGUIENTE RECUADRO.

_____
_____
_____

Visualiza una respuesta razonable.

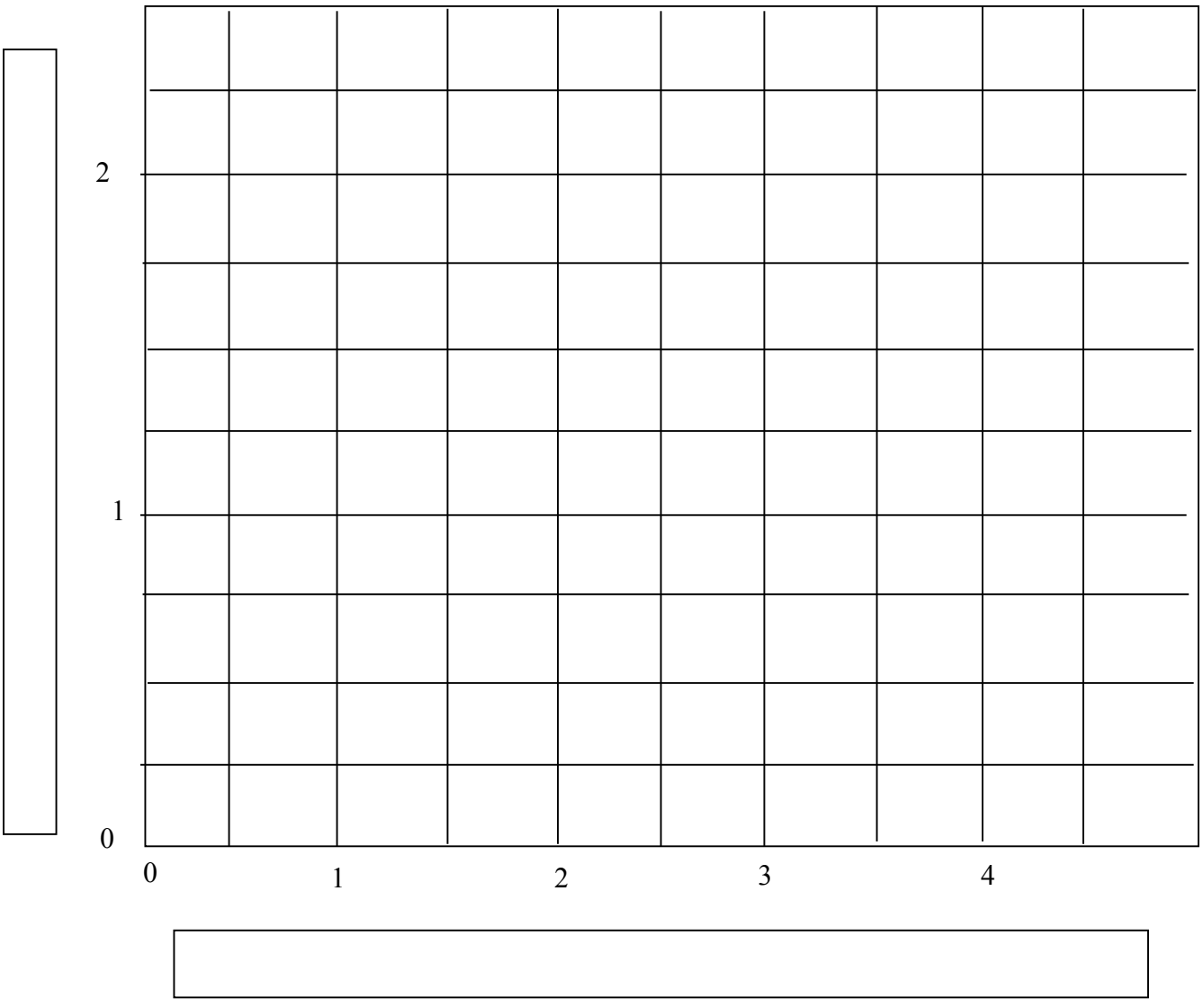
Usa los patrones de razones equivalentes para resolver el problema.

Usa la multiplicación cruzada para resolver el problema.

Unit 1 Lesson 1 – Follow-up

Four per group

Strategy Worksheet – Graph



Materials
(BLM denotes blackline masters provided in the curriculum)
- 1 large apple
- 2 paper dessert plates
- 2 paper towels
- 2 plastic knives

All items listed above per partner pair
- **BLM** Apple-Snack Fractions

Math Objectives
- Use addition, subtraction, multiplication and division to solve problems involving fractions and decimals.
- Convert between fractions, decimals, whole numbers and percents.
- Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios).
- Estimate and find solutions to application problems involving percent.

Language Objectives
- Explain solution strategies.

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
encouraged
disappointed
champion
dedication
mentor

Unit 1, Lesson 1 — Grades 7-8

Snack Fractions

Students should wash their hands before this activity if using food items.

Snack Fractions
As part of each math day, please include a quick "Snack Fraction" activity. If your district/school does not allow any snacks to be given to students, please alter the activity by providing a paper shape to be divided into fractional parts.

Tell students that each day you will have them share snacks with partners or small groups. Today, you are going to walk through the activity with them so they understand the format for the rest of the snack fraction activities for this unit.

Read through the BLM with the students, asking them each question and having them determine the answer before moving on to the next problem. Be sure you ask them to explain their thinking for every solution strategy used. An answer guide has been provided for you for this lesson based on 15 apples at a cost of $12.80. You will, of course, need to alter the actual task based on your numbers.

The strategies suggested are certainly not the only strategies that could be used to solve the unit rate and proportion problems, but are helpful to students who don't yet understand the short cuts.

Please be sure to LABEL every part of proportions – students often get lost in what the numbers represent.

Sharing Between Two People
- 7-8 graders should not have a problem with this portion. If they do, you know you need to spend more time developing the concept rather than jumping into the arithmetic processes. There are plenty of opportunities during the regular curriculum for this.

Sharing Among Four People
- One stumbling stone could be the comparison of proportional unit costs of halves and fourths. Simply set up proportions for students to see the difference, and be sure to label each number in the proportions.

	Unit 1, Lesson 1 **Grades 7-8** **Snack Fractions** - continued  --- **Snack Operations** • By what percent would your portion decrease if you shared with four people rather than with a partner? ***This one is optional. If your students do not yet understand percent of decrease, don't do this now, but collect the BLMs and come back at a later time to complete.*** **Snack Fraction Journal Writing: BLM Apple Snack Fractions** How did you use ratio and proportion during this snack activity? **Objectives:** Review the objectives with the class, making sure they understand how they achieved each.

One per student

Apple Snack Fractions

Sharing Between Two People

Write a fraction representation of your snack portion: _____

Write a decimal representation of your snack portion: _____

What percent of the apple is your portion? _____

There are _____ apples in the room. The total cost for all of the apples was _____

What is the ratio of apples to students? _____

What is the cost of each student's portion of the snack? _____

Sharing Among Four People

Write a fraction representation of your snack portion: _____

Write a decimal representation of your snack portion: _____

What percent of the apple is your portion? _____

Refer to the number of apples in the room and the actual cost based on sharing with a partner. How would sharing the apple among four students have changed the proportion of apples to students, the number of apples that would have been purchased for the group, and the total cost of the snack?

Snack Operations

By what percent would your portion decrease if you shared with four people rather than with a partner?

Snack Fraction Journal

Explain how you used ratio and proportion in this activity.

One per student

Fracciones de refrigerio de manzana

Compartir entre dos personas

Escribe una representación en fracciones de tu porción de refrigerio: _____

Escribe una representación decimal de tu porción de refrigerio: _____

¿Qué porcentaje de la manzana es tu porción? _____

Hay ___ manzanas en el salón de clase. El costo total de todas las manzanas fue de _____

¿Cuál es la relación de manzanas a estudiantes? _____

¿Cuál es el costo de la porción de refrigerio de cada estudiante? _____

Compartir entre cuatro personas

Escribe una representación en fracciones de tu porción de refrigerio: _____

Escribe una representación decimal de tu porción de refrigerio: _____

¿Qué porcentaje de la manzana es tu porción? _____

Considera el número de manzanas en el salón de clase y el costo real basado en compartir con un compañero. ¿Cómo habrían cambiado la proporción de manzanas a estudiantes, el número de manzanas que se habrían comprado para el grupo y el costo total del refrigerio si se hubieran compartido las manzanas entre cuatro estudiantes?

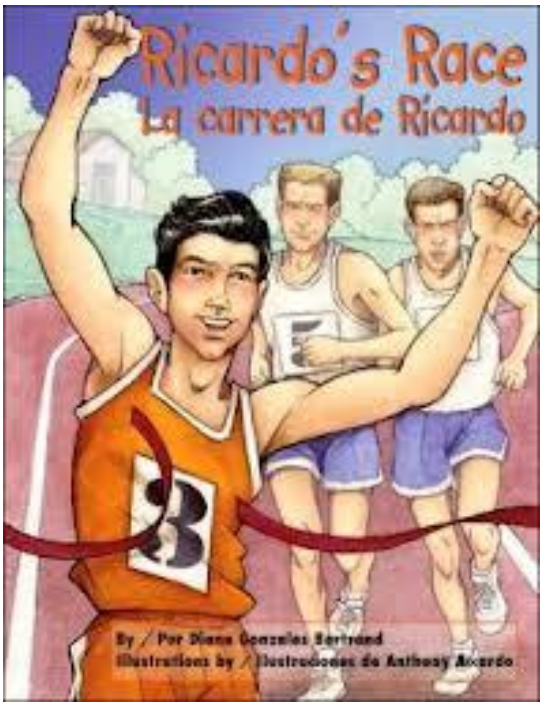
Operaciones con refrigerios

¿En qué porcentaje disminuiría tu porción si compartieras con cuatro personas en vez de con un compañero?

Diario de fracciones de refrigerios

Explica cómo usaste las relaciones y proporciones en esta actividad.

Unit 1 Lesson 1 – Family Fun



Dear _____,

We read an interesting story in class today called ***Ricardo's Race***.

It is about…

_____
_____
_____
_____
_____
_____

Today in math we learned…

_____
_____
_____
_____
_____
_____

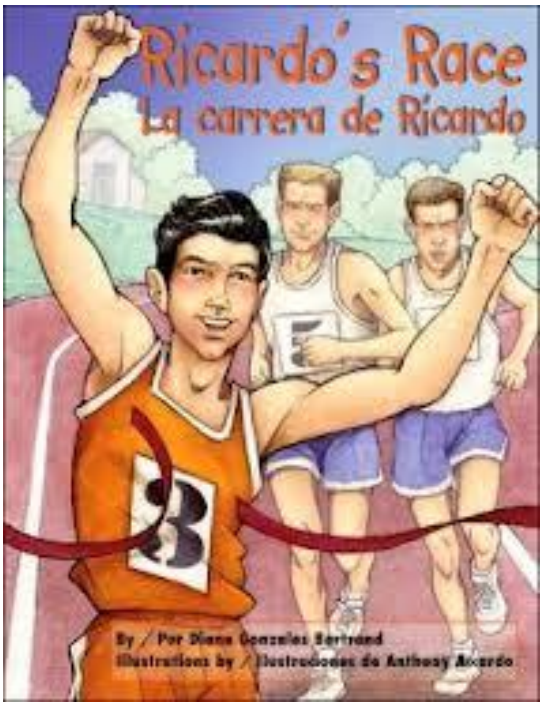
My teacher would like for us to:

- Find situations at home where rate of speed is important.

Sincerely,

_____

Unit 1 Lesson 1 – Family Fun



Querido/a _____,

Leímos una historia muy interesante hoy que se titula *La carrera de Ricardo*.

Se trata da…

_____
_____
_____
_____
_____
_____

En la clase de matemáticas aprendimos…

_____
_____
_____
_____
_____
_____

Mi maestro/a quiere que nosotros:

- Encontrar situaciones en casa donde la tasa de velocidad es importante.

Atentamente,

_____

Materials
- **BLM** Rectangular Prism-Measurement Lab Record Sheet
- **BLM** Solve It! Problem 1-2
- **BLM** Solve It! Problem 3
- **BLM** Fraction Action and *X* Marks the Spot
- **BLM** Lessons 2-3 CGI ***Ricardo's Race***

Math Objectives
- Solve word problems using a variety of strategies and defend their strategies.
- Model and solve 2-step word problems.
- Compose and decompose values to show a new representation of the value.
- Find equivalent fractions.

Language Objectives
- Speak to partners, teacher, and class using vocabulary.
- Discuss problem solving process and strategies.
- Explain how they decided to rename the target number.
- Discuss scarcity of money, choices and cost benefit.

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
encouraged
disappointed
champion
dedication
mentor

Unit 1, Lesson 2 — Grades 7-8

Daily Routine

The following daily activities will help prepare your students for the Post-assessment. They are not optional.

ESSENTIAL

Measurement Lab
- Lesson 1 – omit today
- **Lesson 2 – Find area of faces & surface area of rectangular prisms.**
- Lesson 3 – Find area of parts and surface area of cylinders.

Lesson 2 Materials
- Cardboard boxes (easy to cut apart such as cereal, shirt, etc.)
- Scissors
- Plain paper / pencil
- 1" Grid paper
- Ruler

Lesson 2 Student Groups
- Cut apart faces of rectangular prism.
- Find the approximate area of each face of the prism.
- Label each part with the area, number and unit *(such as 24 in^2)*.
- Find the approximate surface area of the rectangular prism.
- Write an explanation of how they found the surface area.

Solve It! Multi-step problem solving
- Lesson 1 – Omit
- **Lesson 2 – partners, 2-step problem**
- Lesson 3 – partners, 2-step problem

Fraction Action
- Lesson 1 – Omit
- **Lesson 2 – BLM Fraction Action and X marks the Spot**
- Lesson 3 – BLM Fraction Action and X marks the Spot

***X* Marks the Spot**
- Lesson 1 – Omit
- **Lesson 2 – BLM Fraction Action and X marks the Spot**
- Lesson 3 – BLM Fraction Action and X marks the Spot

CGI
- Lesson 1 – Omit
- **Lesson 2 – Rate (assessment item 7)**
- Lesson 3 – Price (assessment item 6)

Assessment Items (As a result of experiencing this unit, students will learn skills necessary to be successful on the following Assessment items.) **1** (ratio - Math Lesson) **4** (ratio perspective - Math Lesson) **5** (ratio perspective- Math Lesson) **6** (rate - CGI) **7** (unit rate - CGI)	**Unit 1, Lesson 2** **Grades 7-8** **Daily Routine** - continued **----------** **The following activities, although certainly developmentally appropriate for your 7th and 8th grade students, do not specifically address objectives assessed on the Post-assessment. Schools with shorter teaching spans can consider omitting some or all these activities as your time permits.** **----------** **OPTIONAL** **Target Number** • Lesson 1 – Omit • **Lesson 2 – Target Number 12** • Lesson 3 – Target Number 24 **Money Matters** (*If you have a full program and wish to use this optional activity, you will find BLMs and Explanations in the Optional Activities Tab of your Teacher's Guide*.)

Unit 1 Lesson 2 – Daily Routines - Measurement Lab

One per student

Rectangular Prism – Measurement Lab Record Sheet

Students should work in small groups.

Materials:

- Cardboard boxes (easy to cut apart such as cereal, shirt, etc.)
- Scissors
- Plain paper / pencil
- 1" Grid paper
- Ruler

Task:

1) Find the approximate area of each of the rectangular prism faces.

2) Label each face with the area (number and unit – for example 24 in^2).

3) Find the surface area of the rectangular prism – that's the total area of all of the faces.

4) Draw rectangles below to represent the faces, labeling each with dimensions and area.

5) Write an explanation of how you found the surface area of the rectangular prism.

Unit 1 Lesson 2 – Daily Routines - Measurement Lab

One per student

Rectangular Prism – Measurement Lab Record Sheet

Los estudiantes deben trabajar en grupos pequeños.

Materiales:

- Cilindros de cartón (fáciles de recortar como cajas de cereal, etc.)
- Tijeras
- Papel y lápiz
- Papel con cuadrícula de 1 pulgada
- Regla

Tarea:

1) Encuentra el área aproximada de cada una de las caras del prisma rectangular.

2) Etiqueta cada cara con su área (número y unidad – por ejemplo, 24 in^2).

3) Encuentra el área de la superficie del prisma rectangular- es decir, el área total de todas sus caras.

4) Dibuja las partes debajo para representar las caras, etiquetando cada una con sus dimensiones y su área.

Escribe una explicación de cómo encontraste el área de superficie del prisma rectangular.

Unit 1 Lesson 2 – Daily Routines - Solve It! Problems (Pairs)

One per student

Partner #1 - Problem 1:
Jocelli treated Maryellen to lunch at their favorite café. Jocelli had the lunch special which was $8.95, and Maryellen had the chef salad which was $5.95. What was the cost of the two meals before tax?

Problem Solution Name:	**Solution Verification** Name:

Partner #2 - Problem 2:
Sales tax charged was 8%. What was Jocelli's bill?

- What do you need from Problem 1 to solve Problem 2?
- Be sure to verify the answer to Problem 1 before solving Problem 2.
- What is the answer to the question? Show your solution strategy.

Problem Solution Name:	**Solution Verification** Name:

Unit 1 Lesson 2 – Daily Routines - Solve It! Problems (Pairs)

One per student

Compañero # 1 - Problema 1:
Jocelli invitó a Maryellen a comer a su café favorito. Jocelli pidió el almuerzo especial, que costaba $8.95, y Maryellen pidió la ensalada del chef, que costaba $5.95. ¿Cuál fue el costo de las dos comidas antes de impuestos?

Solución del problema Nombre:	**Verificación de la solución** Nombre:

Compañero # 2 - Problema 2:
El impuesto de venta fue del 8%. ¿Cuál fue la cuenta que pagó Jocelli?

- ¿Qué necesitas del problema 1 para resolver el problema 2?
- Asegúrate de verificar la respuesta del problema 1 antes de resolver el problema 2.
- ¿Cuál es la respuesta a la pregunta? Muestra tu estrategia de solución.

Solución del problema Nombre:	**Verificación de la solución** Nombre:

Unit 1 Lesson 2 – Daily Routines - Solve It! Problems (Pairs)

One per student

Work with your partner to solve the problem.

Problem 3:
It was Maryellen's turn to treat Jocelli to lunch. They rode their bicycles to their favorite sandwich shop. Maryellen's soup and sandwich combo was $10.95 while Jocelli's turkey sub combo was $9.95. They shared a $1.50 cookie for dessert. It was tax free Saturday, but Monica left a 20% tip. What was the total bill?

Problem Solution Name:	**Solution Verification** Name:

Unit 1 Lesson 2 – Daily Routines - Solve It! Problems (Pairs)

One per student

Colabora con tu compañero para resolver el problema.

Problema 3:
Era el turno de Maryellen de invitar a Jocelli a comer. Fueron en sus bicicletas a su tienda favorita de sándwiches. El combo de sándwich y sopa de Maryellen costó $10.95, mientras que el combo de sándwich de pavo de Jocelli costó $9.95. Las dos compartieron una galleta de $1.50 de postre. Era un sábado sin impuestos, pero Monica dejó una propina de 20%. ¿Cuál fue la cuenta total?

Solución del problema Nombre:	**Verificación de la solución** Nombre:

Unit 1 Lesson 2 – Daily Routines – Fraction Action and *X* Marks the Spot

One per student

Fraction Action

Materials:

- Three 2" x 6" paper strips per student
- Crayons or makers
- Paper/pencil

Task:

Fold and cut one strip into two equal pieces. Fold and cut one strip into four equal pieces. Fold and cut one strip into eight equal pieces.

Use the pieces to find equivalent fractions for 1/2, 1/4, 3/4. Record your fractions below.

Explain how you know that each of your comparisons are indeed equivalent relationships.

On the back of this sheet, verify your equivalent fractions through another strategy (common denominator, draw a picture, proportion) and be able to explain your strategy.

X Marks the Spot

Solve for x in these two equations.

$5x = 95$	$4x + 3 = 95$

Unit 1 Lesson 2 – Daily Routines – Fraction Action and *X* Marks the Spot

One per student

Acción con fracciones

Materiales:

- Tres tiras de papel de 2 x 6 pulgadas por estudiante
- Crayones o marcadores
- Papel y lápiz

Tarea:

Dobla y corta una tira en dos partes iguales. Dobla y corta una tira en cuatro partes iguales. Dobla y corta una tira en ocho partes iguales.

Usa las piezas para encontrar fracciones equivalentes para $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$. Registra tus fracciones abajo.

Explica cómo sabes que cada una de tus comparaciones es realmente una relación equivalente.

En la parte posterior de esta hoja, verifica tus fracciones equivalentes usando otra estrategia (común denominados, hacer un dibujo, proporción) y sé capaz de explicar tu estrategia.

X marca el sitio

Resuelve para *x* en estas dos ecuaciones.	
$5x = 95$	**$4x + 3 = 95$**

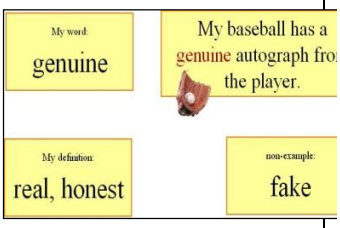
Materials
- **BLM** Vocabulary Building: Visual-Verbal Word Association
- Author Diane Gonzales Bertrand reads ***Ricardo's Race***
- Interview with Dr. Ricardo Romo

Literature Selection
Ricardo's Race
La carrera de Ricardo
by Diane Gonzales Bertrand

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
encouraged
disappointed
champion
dedication
mentor

Technology Option
Use Inspiration software to create the Visual-Verbal Word Association organizer (or any other vocabulary organizer used during the lessons).



Unit 1, Lesson 2 — 7-8

Classroom Lesson

Every day teachers must post the objectives on the board, read them to the students, and have students read them together with the teacher. At the end of the lesson, teacher and students should review to see if they have accomplished both math and language objectives.

Math Objectives:
- Use any strategy to find your personal speed walking unit rate.
- Compare your personal speed walking rate with Ricardo's rate.
- Compare your personal speed walking rate with other moving objects.

Language Objectives:
- Explain the strategy used to find your personal speed walking unit rate.
- Discuss vocabulary words and meanings with peers.
- Listen to ***Ricardo's Race***.
- Use a Venn diagram to write out the differences between your life and Ricardo's life.

BEFORE READING

Building Background - Vocabulary

Tell students that to help them talk about Ricardo Romo's life, you will help them practice how to use the new vocabulary words they learned from ***Ricardo's Race***. They will use the Visual-Verbal Word Association sheet to help internalize their understanding of the vocabulary. Give students three copies of the Word Association sheet.

Comprehensible Input - Vocabulary

Visual-Verbal Word Association activity

Model and practice the process with students using one of the vocabulary words: *mentor*:

- Box 1:
  Model: Write the word *mentor* on the record sheet in the top left rectangle and pronounce the word.
  Practice: Students copy the word in their own graphic organizer.

- Box 2:
  Model: Explain a definition for *mentor* in your own words. Write this definition in the lower left hand rectangle.
  Practice: Students copy this definition in their own graphic organizer.

- Box 3:
  Model: Show students how you think of a personal relationship you have with the word by using it in a sentence. Write that sentence in the upper right hand rectangle.

Classroom Lesson - continued

Technology Option
Use one of the Inspiration software templates to construct the Venn diagram.

ELPS:
2E, 2G, 3D, 3E, 3H, 4F, 5G

Practice: Students talk with a partner to share their own sentence using the word. If students struggle to correctly use the word in a sentence, model another example or two for them to clarify the word's meaning and how to use it. Have students write their original sentence in their own graphic organizer.
ELLs: Beginning and early intermediate ELLs can write the sentence in their native language if necessary, or very closely model their sentence on the teacher's example.

- Box 4:
  Model: Think aloud what a non-example could be for the word and write that in the lower right rectangle. For *mentor* a non-example is *pupil* or *student* (someone who is learning from the mentor).
  Practice: Students copy this non-example in their own graphic organizer.

Practice and Application - Vocabulary

Visual-Verbal Word Association activity
Have students work with a partner to create a Visual-Verbal Word Association sheet for two words:

- *encourage*
- *disappointed*

ELLs: While students work independently on this activity, you can meet with a small group of beginning and intermediate ELLs to create the four parts of the Visual-Verbal Word Association posters collaboratively. For the "personal relationship" part, model how to use the word in a sentence, and write the sentence down so they can see it. Have your ELLs create a similar sentence based on your model.

Have students share their words with one another by lining up into two equal lines facing one another. Students, facing one another, take turns sharing the word *encourage*. After a specified time determined by the teacher, the line on the left of the teacher moves one person to the right. Student who is displaced at the head of the line walks to the end of the same line to share with the person in the opposite line. ONLY ONE LINE MOVES. After several times sharing *encourage*, have students share what they wrote for *disappointed*.

Word Family activity
Tell students they are going to add a Word Family word to their Visual-Verbal Word Association sheets for the words *encourage* and *disappointed*. Word family words are ones that have the **same root.** For example, once students know how to use the word *encourage*, they should learn how to use a word with the same root, such as *encouragement.* Often students learn how to use one word, but are unable to use related word family words correctly.

Guided Reading Groups & Independent Reading Connection
If you include guided reading groups or independent reading as part of your balanced literacy program, you can help students recognize **root words** in a text to support their understanding of new words.

When students are reading and they come to a word they don't know, you can ask them:

1. Does this look like a word you know?
2. What does that word mean?
3. So then what could this word mean?

Classroom Lesson - continued

This activity helps students expand their academic vocabulary and recognize relationships between words based on their roots:
encourage: **encouragement**
disappointed: **disappointment**

Start with the word *encourage.*

1. Ask students: "Are there any other words you know that are similar to this word? (Words that have the same root?)"

2. Based on what students share, introduce a word family word you want students to learn how to use. In this case, introduce the word *encouragement*.

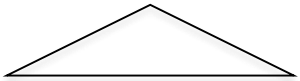
3. Below the Visual-Verbal Word Association boxes, write the new word. You can write the word inside a house to indicate that it's part of the same "family." Have students do the same on their own sheet.

4. Explain the difference between the original vocabulary word and this new word. For example, one might be a verb, and the other might be a noun.

5. Model how to use the word in a sentence. Have students think of their own sentence using the word, and have them write it on their own sheet.

For example:

encourage *verb*	My teacher **encouraged** me to apply for a scholarship.
to give support to someone	discourage



encouragement
noun

My teacher gave me **encouragement** to apply for a scholarship.

You can use one of the Inspiration software templates to construct the Venn diagram.

Unit 1, Lesson 2 7-8

Classroom Lesson - continued

ELLs: Beginning and early intermediate ELLs can write the sentence in their native language if necessary, or very closely model their sentence on the teacher's example. You can also briefly meet with individual ELLs or a small group to help them write a sentence while the rest of the class writes their own.

Students should place their completed organizers in their vocabulary binders.

Building Background - Literature

Show students the attribute chart they worked with in Lesson 1:

Attributes of a CHAMPION							
	dedicated	**rude**	**Dis-appointed**	**motivated**	**lazy**	**encouraged**	**hard working**
Ricardo	**x**		**x**	**x**		**x**	**x**

Remind them that these are all words that can describe a champion. Anyone can have the characteristics of a champion. Ask students if any of them feel they have similar attributes:

- Have you ever been **dedicated** to something?
- Have you ever felt **disappointed**?
- Have you ever felt **motivated** to do something?
- Have you ever felt **encouraged** by someone?
- Have you ever felt like you are a **hard-working** person?

Use students' responses to start filling in a Venn diagram comparing students' lives with Ricardo's life. For example, with **dedicated**:

- In the overlap section of the circles: "Both dedicated."
- In Ricardo's circle: "Ricardo was dedicated to running."
- In the students' circle: "(Student's name) is dedicated to helping his family."

Tell students that today they will listen to author Diane Gonzales Bertrand read part of the biography. As they listen, they should be thinking about other ways their lives are similar to Ricardo's, or different.

Classroom Lesson - continued

DURING READING

Comprehensible Input - Literature

Have students listen to a portion of the selection: from the 1st page through the page that begins "As a seventh grader, Ricardo and his brother took the bus to Horace Mann Junior High School . . ."

Pause the reading in places where you think your students can make comparisons to their own lives. Continue to fill in the Venn diagram to compare Ricardo's life with the students' lives. What is different? What is alike?

AFTER READING

Practice and Application – Literature

Help students discuss the comparisons they made on the Venn Diagram using comparative language. Guide the conversation to discuss how Ricardo's life was shaped by the **same situations** the students find themselves in. What did Ricardo do in those situations that helped him positively?

The following sentence stems will help students improve the language they use to compare and contrast. They are grouped as beginning or advanced sentence stems. You can choose which ones to introduce based on your students' familiarity with these language structures and their English proficiency level.

ELLs: If your class has a range of English proficiency levels, display all of the sentences. Help beginning and intermediate ELLs use the beginning sentence stems, and help advanced ELLs and English-proficient students use the advanced sentence stems.

<u>Beginning: Comparative Language</u>
Ricardo and I both _____.
Ricardo and I are similar because we both _____.
Ricardo and I are different because _____.

<u>Advanced: Comparative Language</u>
Ricardo _____. Similarly, I _____.
Ricardo _____. On the other hand, I _____.
Ricardo _____, whereas I _____.

Arthimus Portio's Corner
MAS Space
Today on MAS Space, we would like to know how you compared your lives to Ricardo Romo's life up to being a 7th grader. Use portions of everyone's letter to Dr. Romo and generate a class letter. Please post your class letter on MAS Space in Arthimus Portio's Corner.

Unit 1, Lesson 2 — 7-8

Classroom Lesson - continued

Transition to Math

Building Background - Math

In 1966, Ricardo became the first Texan to run a mile in less than four minutes.

This is a rate of speed. One mile per four minutes. What other rates of speed can students recall? Write their ideas on the board. Here are some in case you need to get the ball rolling. Record all of their suggestions. Maybe they remember some of the rates from last summer's readings? Use what they know.

55 miles per hour (some highways)
35 miles per hour (some city streets)
20 miles per hour (some school zones)

Students will use their knowledge of rates of speed today. The above examples are UNIT RATES because they are the rate per a single unit, in this case one hour *(notice that the one mile per four minutes is NOT a unit rate)*. Students will need this knowledge for the TV Lesson.

Objectives

Review both language and math objectives, making sure students understand how they accomplished each.

Unit 1 Lessons 2, 3 – Classroom Lesson

Print multiple copies for students and have available for use at any time during the summer session.

Vocabulary Building: Visual-Verbal Word Association

Vocabulary Term	**Personal Association**
Definition	**Non-Example**

Vocabulary Term	**Personal Association**
Definition	**Non-Example**

Unidad 1

Lecciones 2 y 3 – Desarrollo de vocabulario: Asociación visual-verbal de palabras

Imprima varias copias por estudiante y téngalas disponibles para usarlas en cualquier momento de la sesión de verano.

Término de vocabulario	**Asociación personal**
Definición	**No ejemplo**
Término de vocabulario	**Asociación personal**
Definición	**No ejemplo**

Materials
- 4-function calculator

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
encouraged
disappointed
champion
dedication
mentor

Teacher Note
Allows students to give ideas.

Unit 1, Lesson 2 7-8

Math Lesson

Math Objectives:

- Write rates as ratios *(fractions)* with proper labels.
- Compare rates with unit rates.
- Draw a visual representation to compare two ratios.
- Use a pattern to find equivalent ratios.
- Use cross multiplication to solve for an unknown.
- Create a graph to solve a rate problem.

Language Objectives:

- Write rates and ratios using proper labels.
- Talk about the differences between rates, ratios and unit rates.
- Discuss problem solving strategies with peers.
- Work with others to solve problems.

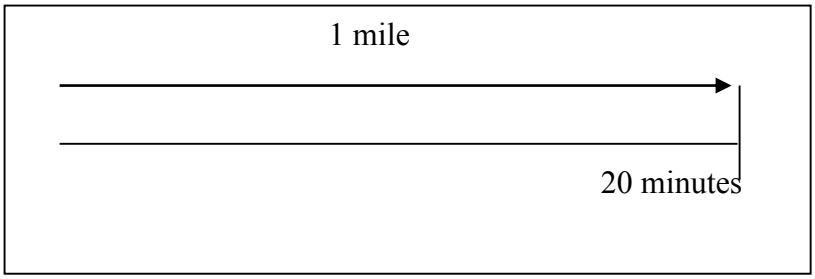
Building Background
Read through and quickly summarize the math and language objectives. Tell students that you also timed your speed-walk today, and that you could walk one mile in 20 minutes. Ask them to set up the ratio of miles to minutes then write the ratio.

$$\frac{1 \text{ mile}}{20 \text{ minutes}}$$

Is this a UNIT RATE? *Allow class to discuss their thinking.*

Have students find out the unit rate for your walking, or how far you can walk in ONE minute.

Comprehensible Input
First, have students estimate for reasonableness. **About how far do you think I would walk in 1 minute?** Use the visualization used in Lesson 1.



Technology Option
Students may use calculators to divide decimals, as those specific calculations are not the focus of the problem/lesson. Laborious efforts to divide decimals may obscure the mathematical concept and true purpose of the problem/lesson.

Teacher Note
Decimals should be read correctly to emphasize place value.

Ex: 0.05 is read five-hundredths

Teacher Note
These are the same strategies as in lesson 1. A little less time will be spent on this portion so that the extension can be accomplished.

Math Lesson - continued

So, if I walk one mile in 20 minutes, and I break up the minutes into 20 one-minute pieces *(do so)*…
I can also break up one mile into 20 pieces *(do so exactly as time is broken up)*. That means I can walk $1/20^{th}$ of a mile in one-minute. OR (calculator) one divided by 20 is 0.05 of a mile in one-minute.

Now look for a pattern in the relationship between the numerator and denominator of the known ratio.

$$\frac{1}{20}$$

The numerator is one- twentieth the size of the denominator. The denominator is 20 times larger than the numerator.

I need to find a relationship where the denominator is ONE, and the numerator is a 20^{th} of ONE.

What does that mean? Talk to a partner to see if you can determine how to generate a numerator that is a 20^{th} of ONE. *(pause)*

I need to divide the numerator in 20 equal parts, then take one of them. One divided by 20 = (long handed or calculator) 0.05 (five-hundredths). Same answer as our visualization.

Now try it arithmetically with the cross multiplication algorithm.

$$\frac{1 \text{ mile}}{20 \text{ minutes}} = \frac{x \text{ mile}}{1 \text{ minute}}$$

Denominator to opposite numerator.

$$\mathbf{20}x = \mathbf{1}$$

To isolate the x we have to divide by 20 on both sides.

$$x = \mathbf{0.05}$$

So I can walk 5-hundredths of a mile in one-minute. The ratio is

$$\frac{\mathbf{0.05 \text{ mile}}}{\mathbf{1 \text{ minute}}}$$

Technology Option Use a graphing calculator to graph this one.	**Unit 1, Lesson 2** **7-8** **Math Lesson** - continued  --- To use a graph to solve this problem, I'm going to use the graphing calculator. I COULD do it by hand, but to find 0.05 on a graph would be very tedious when I have a tool that can help me. *(do so)* Once again, all three strategies have given me the same answer. I am quite confident now that if I walked at a constant rate of 1 mile in 20 minutes, then I would walk five-hundredths of a mile in ONE minute. The unit ratio is five-hundredths to one, and I can write that as **0.05 : 1** **or** $\frac{0.05}{1}$ If I could keep up the same rate of walking, how long would it take me to walk five miles? Go through the same processes: --- visualize and estimate --- find a pattern in the relationship --- cross multiply --- graph it. Students will use their understanding of equivalent ratios to solve a conversion problem during the Follow-up Lesson. Remind students that conversions are simply ratios. **MAS Space** We would like to know how you compared your lives to Ricardo Romo's life up to being a 7th grader. Use portions of everyone's letter to Dr. Romo and generate a class letter. Please post your class letter online. **Objectives:** Read through the math and language objectives, making sure that the students understand how they accomplished each.

Materials
- **BLM** Olympic Problem
- Straight edge
- 4-function calculator (optional)

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
encouraged
disappointed
champion
dedication
mentor

Bio Poem
Students could write a Bio Poem about Ricardo Romo. Here are directions:
http://cuip.uchicago.edu/~adarice/cwsite/poems/poembio.htm

Unit 1, Lesson 2 7-8

Follow-up

Math Objectives
- Write rates and equalities as ratios with proper labels.
- Choose an equivalent ratio strategy to solve a ratio problem.

Language Objectives
- Write rates and ratios using proper labels.
- Explain your problem solving strategy to peers.
- Write a description of how a unit rate is more specific than a rate.

Practice and Application
You should not have to model today. Walk around the room asking questions to clarify, explain, and extend.

QUESTIONS
- How can this information help you?
- What information given can be set up as ratios?
- Explain the relationship in your ratios.
- What does each part of your ratio represent?
- Can you solve this another way?

Recursive Review
none for today

Writing Topics
Independent Writing Topic
Students will have a daily writing activity which will incorporate the day's focus math vocabulary.

- Explain why a UNIT RATE is more specific than a RATE. different units.

Class Writing Topic

- I Learned/ I Still Don't Understand Chart

Today I learned . . .	I still don't understand . . .

	Unit 1, Lesson 2 **7-8** **Follow-up** - continued  --- Use the chart begun in Lesson 1. Students should first read through the "I still don't understand…" column. What are ideas that can now easily be explained? Students should reflect for a few minutes before responding. Move any concepts to the "Today I learned…" that all students can now explain. Return to this every day to see how many of the "I still don't understand" statements move to the left by the end of the week. **Objectives** Review the math and language objectives to make sure that they were accomplished and that the students realize how they were accomplished.

Unit 1 Lesson 2 – Follow-up

One per student

Olympic Problem

Important Information:
The Olympic record for running 1500 meters is 4.02 minutes.
1 mile is equal to 1.61 kilometers.
1 kilometer is equal to 1000 meters.

Procedure:
There is no "mile run" in the Olympics, but the 1500 meter race is contested. Use the information above to help you determine the rate at which the record holder would run a mile if he ran it at the same speed he reached to set the record in the 1500 meter race above.

Calculate:
Show all of your work and be ready to explain and justify your thinking. (HINT: Remember that conversions are ratios.)

Lección 2 – Problema de la lección de seguimiento

El récord olímpico para la carrera de 1,500 metros es 4.02 minutos.
1 milla es igual a 1.61 kilómetros.
1 kilometro es igual a 1,000 metros.

No hay una carrera de 1 milla en las Olimpiadas, pero si existe la carrera de 1,500 metros. Usa la información de arriba para determinar la velocidad a la que el poseedor del récord correría una milla si corriera a la misma velocidad que corrió al establecer el record mencionado arriba. Muestra todo tu trabajo y prepárate para explicar y justificar tu razonamiento. (PISTA: Recuerda que las conversiones son razones.)

Materials
- 1 large ice cream sandwich
- 2 paper dessert plates
- 2 paper towels
- 1 plastic knife
- 2 pieces wax paper
- 2 pair of scissors

All items listed above per partner pair
- **BLM** Ice Cream Sandwich-Snack Fractions

Math Objectives
- Use addition, subtraction, multiplication and division to solve problems involving fractions and decimals.
- Convert between fractions, decimals, whole numbers and percents.
- Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios).
- Estimate and find solutions to application problems involving percent.

Language Objectives
- Discuss fraction comparisons.
- Discuss fraction equivalencies.

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
encouraged
disappointed
champion
dedication
mentor

Unit 1, Lesson 2 7-8

Snack Fractions

Students should wash their hands before this activity if using food items.

Snack Fractions
As part of each math day, please include a quick "Snack Fraction" activity. If your district/school does not allow any snacks to be given to students, please alter the activity by providing a paper shape to be divided into fractional parts.

Tell students they will use the same process today that they used in the Snack Fraction for Lesson 1. They will first work through the record sheet together, then share the actual snack.

Circulate the room to make sure students understand the process from Lesson 1. Draw students' attention to the multiplication tasks. How is this different from Lesson 1? (*In lesson 1, students had to find sentences whose sum was one. Today, students may use any fractional sentences using the two fractional parts; AND students will recognize a verbal multiplication problem. The sum does not have to equal one. Also, they are to find a subtraction sentence as well. Remind them that they may use the wax paper if they wish to trace and cut the pieces to model.)*

Snack Fraction Journal Writing: BLM Ice Cream Sandwich Fractions
Explain how dividing by 2 and multiplying by 1/2 result in the same answer.

Objectives: Review the objectives with the class, making sure they understand how they achieved each.

Unit 1 Lesson 2 – Snack Fraction

One per student

Ice Cream Sandwich – Snack Fractions

Sharing Between Two People

My name is _____.

I shared an ice cream sandwich with my partner today.

We received _____. (word)

I can tell that ONE-HALF of a whole = ONE-HALF.

Here is the multiplication number sentence for that mathematical statement.

$\frac{1}{2}$ = _____ (decimal). My portion = _____% of the ice cream sandwich.

Sharing Between Ten People

If there had been ten of us, my share would have been _____. (word)

I can tell that ONE-TENTH of a whole = ONE-TENTH.

Here is the multiplication number sentence for that mathematical statement.

$\frac{1}{10}$ = _____ (decimal). My portion = _____% of the ice cream sandwich.

Sharing Between Six People

Draw a picture and write a number sentence that proves that half of one-sixth is one-twelfth.

Extra Practice

Generate two fraction addition sentences and one fraction subtraction sentence using like-denominators from this lesson such as halves, sixths, and tenths.

Unit 1 Lesson 2 – Snack Fraction

One per student

Ice Cream Sandwich – Snack Fractions

Compartiendo entre dos personas

Mi nombre es _____

Compartí mi sándwich de helado con un compañero/a hoy.

Cada uno recibimos _____. (palabra)

Puedo notar que UNA MITAD de la parte entera = UNA MITAD

Esta es la oración numérica de multiplicación para este hecho matemático:

$\frac{1}{2}$ = _____ (decimal). Mi porción = _____% del sándwich de helado.

Si éramos diez, mi porción sería: _____. (palabra)

Puedo notar que UN DÉCIMO de la parte entera = UN DÉCIMO.

Esta es la oración numérica de multiplicación para este hecho matemático:

$\frac{1}{10}$ = _____ (decimal). Mi porción = _____% del sándwich de helado.

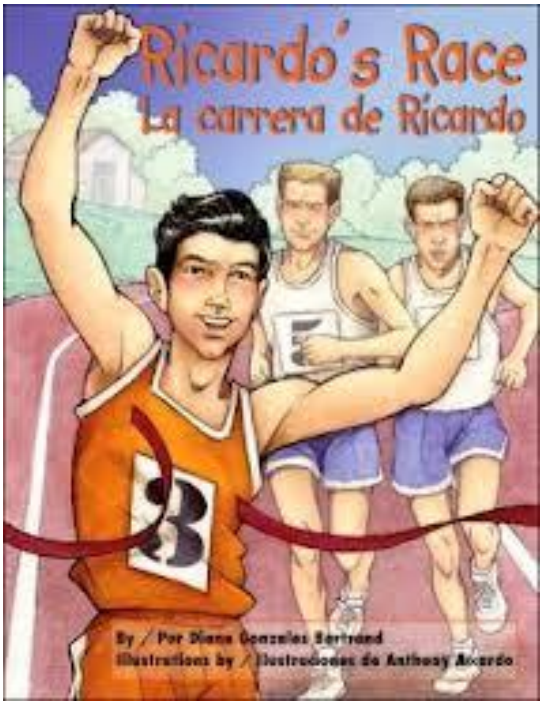
Compartiendo entre seis personas

Haz un dibujo y escribe una oracién numérica que hace prueba de que la mitad de un sexto es un duodécimo.

Práctica adicional

Haz dos oraciones de suma con fracciones y una oración de resta con una fracción. Usa fracciones de denominadores iguales de esta lección como mitades, sextos y décimos.

Unit 1 Lesson 2 – Family Fun



Dear _____,

We read more of ***Ricardo's Race*** today.

Did you know that…

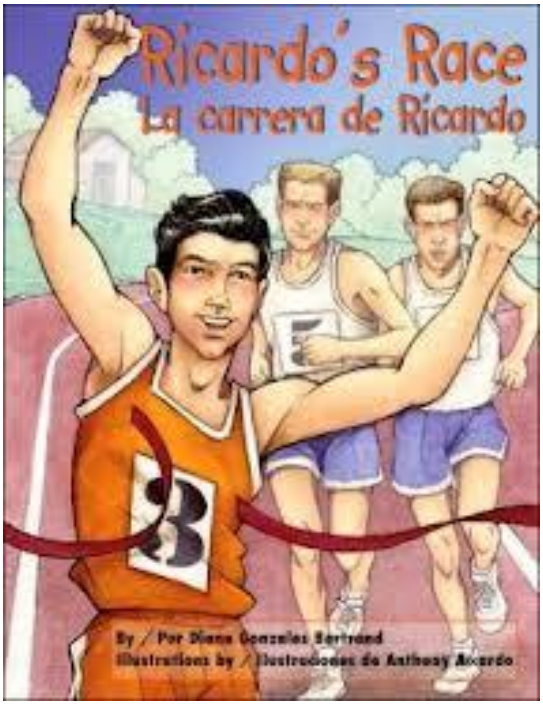
_____
_____
_____
_____
_____
_____

My teacher would like for us to:

Sincerely,

_____

Unit 1 Lesson 2 – Family Fun



Querido/a _____,

Hoy continuamos con la lectura de *La carrera de Ricardo*..

Sabías que…

_____
_____
_____
_____
_____
_____

Mi maestro/a quiere que nosotros:

Atentamente,

Materials
- **BLM** Cylinder-Measurement Lab Record Sheet
- **BLM** Solve It! Problem 4
- **BLM** Solve It! Problem 5
- **BLM** Fraction Action and *X* Marks the Spot
- **BLM** Lessons 2-3 CGI ***Ricardo's Race*** (listed in Lesson 2)

Math Objectives
- Model and solve 2-step word problems.
- Compose and decompose values to show a new representation of the value.
- Find lateral and total surface area of prisms.
- Find equivalent fractions.
- Compare the annual salary of several occupations requiring levels of post-secondary education or vocational training and calculate the effects of the different annual salaries on lifetime income.

Language Objectives
- Speak to partners, teacher, and class using vocabulary.
- Discuss problem solving process and strategies.
- Explain how they decided to rename the target number.
- Discuss scarcity of money, choices and cost benefit.

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
encouraged
disappointed
champion
dedication
mentor

ELPS:
2C, 2I, 3E, 3H, 4C, 5B

Unit 1, Lesson 3 — Grades 7-8

Daily Routine

The following daily activities will help prepare your students for the Post-assessment. They are not optional.

ESSENTIAL

Measurement Lab:
- Lesson 1 – omit today
- Lesson 2 – Find area of faces & surface area of rectangular prisms.
- **Lesson 3 – Find area of parts and surface area of cylinders.**

Lesson 3 Materials
- cylinders (easy to cut apart such as oatmeal boxes, toilet paper rolls, paper towel rolls, etc.)
- scissors
- plain paper / pencil
- 1" Grid paper
- ruler

Lesson 3 Student Groups
1) Carefully cut cylinders apart using the ruler to make a straight line down the curved surface.
2) Find the approximate area of each part of the cylinder.
3) Label each part with the area, number, and unit *(such as 24 in^2).*
4) Find the approximate surface area of the cylinder.
5) Write an explanation of how they found the surface area. *Remind students that the area of a circle is $\pi(r^2)$

Solve It! Multi-step problem solving
- Lesson 1 – Omit
- Lesson 2 – partners, 2-step problem
- **Lesson 3 – partners, 2-step problem**

Fraction Action
- Lesson 1 – Omit
- Lesson 2 – BLM Fraction Action and X marks the Spot
- **Lesson 3 – BLM Fraction Action and X marks the Spot**

***X* Marks the Spot**
- Lesson 1 – Omit
- Lesson 2 – BLM Fraction Action and X marks the Spot
- **Lesson 3 – BLM Fraction Action and X marks the Spot**

Assessment Items
(As a result of experiencing this unit, students will learn skills necessary to be successful on the following Assessment items.)

1 (ratio - Math Lesson)
4 (ratio perspective - Math Lesson)
5 (ratio perspective- Math Lesson)
6 (rate - CGI)
7 (unit rate - CGI)

Unit 1, Lesson 3 — Grades 7-8

Daily Routine - continued

CGI

- Lesson 1 – Omit
- Lesson 2 – Rate (assessment item 7)
- **Lesson 3 – Price (assessment item 6)**

The following activities, although certainly developmentally appropriate for your 7th and 8th grade students, do not specifically address objectives assessed on the Post-assessment. Schools with shorter teaching spans can consider omitting some or all these activities as your time permits.

OPTIONAL

Target Number

- Lesson 1 – Omit
- Lesson 2 – Target Number 12
- **Lesson 3 – Target Number 24**

Money Matters

(*If you have a full program and wish to use this optional activity, you will find BLMs and Explanations in the Optional Activities Tab of your Teacher's Guide*.)

Unit 1 Lesson 3 – Daily Routines - Measurement Lab

One per student

Cylinder – Measurement Lab Record Sheet

Students should work in small groups.

Materials:

- Cardboard cylinders (easy to cut apart such as cereal, shirt, etc.)
- Scissors
- Plain paper / pencil
- 1" Grid paper
- Ruler

Task:

1) Find the approximate area of each part of the cylinder.

2) Label each face with the area (number and unit – for example 24 in^2).

3) Find the surface area of the cylinder – that's the total area of all of the faces.

4) Draw the parts below to represent the faces, labeling each with dimensions and area.

Write an explanation of how you found the surface area of the cylinder.

Unit 1 Lesson 3 – Daily Routines - Measurement Lab

One per student

Cilindro - Hoja de registro del laboratorio de medición

Los estudiantes deben trabajar en grupos pequeños.

Materiales:

- Cilindros de cartón (fáciles de recortar como cajas de cereal, etc.)
- Tijeras
- Papel y lápiz
- Papel con cuadrícula de 1 pulgada
- Regla

Tarea:

1) Encuentra el área aproximada de cada una de las partes del cilindro.

2) Etiqueta cada cara con su área (número y unidad – por ejemplo, 24 in^2).

3) Encuentra el área de la superficie del cilindro – es decir, el área total de todas sus caras.

4) Dibuja las partes debajo para representar las caras, etiquetando cada una con sus dimensiones y su área.

Escribe una explicación de cómo encontraste el área de superficie del cilindro.

Unit 1 Lesson 3 – Daily Routines - Solve It! Problems (Pairs)

One per pair

Solve your own problem today, showing your work. Verify your partner's problem solution when you both finish your own. Discuss your work.

Partner #1 - Problem 4:
Jocelli was buying clothes for her summer vacation. Luckily there was a sale at her favorite clothes store. All blouses were 40% off. She bought several items, but her favorite purchases were a blouse which was regularly priced $49.99 and a matching pair of shorts for $29.95. What did Jocelli pay for that outfit?

Problem Solution Name:	**Solution Verification** Name:

Unit 1 Lesson 3 – Daily Routines - Solve It! Problems (Pairs)

One per pair

Hoy, resuelve tu propio problema, mostrando el procedimiento. Verifica la solución de tu compañero cuando ambos terminen de hacerlo por sí mismos. Hablen sobre su trabajo.

Compañero # 1 - Problema 4:
Jocelli estaba comprando ropa para sus vacaciones de verano. Por suerte, había una oferta en su tienda de ropa favorita. Todas las blusas tenían un descuento del 40% Ella compró varios artículos, pero sus compras favoritas fueron una blusa que tenía un precio normal de $49.99 y un par de shorts a juego con un precio de $29.95. ¿Cuánto pagó Jocelli por ese conjunto?

Solución del problema Nombre:	**Verificación de la solución** Nombre:

Unit 1 Lesson 3 – Daily Routines - Solve It! Problems (Pairs)

One per pair

Solve your own problem today, showing your work. Verify your partner's problem solution when you both finish your own. Discuss your work.

Partner #2 - Problem 5:
Maryellen walked in the fruit aisle at the grocery store. She weighed out 8 pounds of apples which were $1.49 per pound and 3 pounds of oranges costing $1.89 per pound. What did those two purchases cost her?

Problem Solution Name:	**Solution Verification** Name:

Unit 1 Lesson 3 – Daily Routines - Solve It! Problems (Pairs)

One per pair

Hoy, resuelve tu propio problema, mostrando el procedimiento. Verifica la solución de tu compañero cuando ambos terminen de hacerlo por sí mismos. Hablen sobre su trabajo.

Compañero # 2 - Problema 5:
Maryellen recorrió el pasillo de frutas en la tienda de víveres. Pesó 8 libras de manzanas que costaban $1.49 por libra y 3 libras de naranjas que costaban $1.89 por libra. ¿Cuánto le costaron esas dos compras?

Problem Solution Name:	**Solution Verification** Name:

Unit 1 Lesson 3 – Daily Routines – Fraction Action and *X* Marks the Spot

One per student

Fraction Action

Materials:

- Scrap paper and pencil

Task:

Annalisa combined $1\frac{1}{2}$ cups of juice, $2\frac{3}{4}$ cups of soda, and $1\frac{2}{3}$ cups sherbet for a smoothie drink for her friends. What is the total volume of drink that she made?

On the back of this sheet, verify your equivalent fractions through another strategy (common denominator, draw a picture, proportion) and be able to explain your strategy.

X Marks the Spot

Solve for x in these two equations.

$(6x + 3) + (3x + 4) = 17$	**$(6x + 3)$** **$\underline{+ (3x + 4)}$**

Unit 1 Lesson 3 – Daily Routines – Fraction Action and *X* Marks the Spot

One per student

Fraction Action

Materiales:

- Papel borrador y lápiz

Tarea:

Annalisa combinó $1\frac{1}{2}$ tazas de jugo, $2\frac{3}{4}$ tazas de soda, y $1\frac{2}{3}$ taza de helado para una bebida licuada para sus amigos. ¿Cuál es el volumen total de bebida que hizo?

En la parte posterior de esta hoja, verifica tus fracciones equivalentes usando otra estrategia (común denominados, hacer un dibujo, proporción) y sé capaz de explicar tu estrategia

X marca el sitio

Resuelve para *x* en estas dos ecuaciones.

$(6x + 3) + (3x + 4) = 17$	**$(6x + 3)$** **$\underline{+ (3x + 4)}$**

Literature Selection
Ricardo's Race
La carrera de Ricardo
by Diane Gonzales Bertrand

Materials
- Venn diagram from Lesson 2
- ***Ricardo's Race*** by Diane Gonzales Bertrand
- Word Web technology such as ***Inspirations*** (optional)

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
encouraged
disappointed
champion
dedication
mentor

Teams of students work together on one word, writing a paragraph that describes a scene or a person that would illustrate the word. When all teams have written their paragraph, they take turns reading to the class and guessing which word they are describing. **For example**, can you guess which word I am describing?
The walk home was very tiring. Arnie and his team had lost the game. They really wanted to win because it was the deciding game for the championship. Everyone was very sad. (The word is *disappointed*.)

ELPS:
2C, 2E, 2H, 3D, 3E, 3H, 4C, 5B

Unit 1, Lesson 3 — Grades 7-8

Classroom Lesson

Every day teachers must post the objectives on the board, read them to the students, and have students read them together with the teacher. At the end of the lesson, teacher and students should review to see if they have accomplished both math and language objectives.

Math Objectives:
- Discuss how daily activities use mathematical thinking.
- Compare student generated measurements.

Reading Objective
- Read a biography and look for text evidence to support your ideas.

Language Objectives:
- Use the literature vocabulary to complete Visual-Verbal Word Associations and learn related word family words.
- Write a reading response using evidence from a biography.

BEFORE READING

Practice and Application - Vocabulary

Visual-Verbal Word Association activity
To continue the vocabulary work form Lesson 2, have students work with a partner to create a Visual-Verbal Word Association sheet for each of the remaining two vocabulary words:
- *champion*
- *dedication*

ELLs: While students work independently on this activity, you can meet with a small group of beginning and intermediate ELLs to create the four parts of the Visual-Verbal Word Association posters collaboratively. For the "personal relationship" part, model how to use the word in a sentence, and write the sentence down so they can see it. Have your ELLs create a similar sentence based on your model.

Gallery Walk
When students have finished, have them post their two sheets on the wall. Students take a gallery walk to read other students' Visual-Verbal Word Associations, thinking about which sentences are their favorites. Regroup the class and have students bring their sheets. Ask them to share which classmates had some of their favorite sentences. Those students read aloud their sentences to the class, and explain what made them think of that sentence *(what their personal association is)*.

Classroom Lesson - continued

Word Family activity
To continue the vocabulary work from Lesson 2, tell students they are going to add a Word Family word to their Visual-Verbal Word Association sheets for the words *champion* and *dedication:*

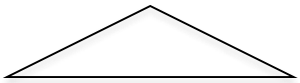
champion: **championship**
dedication: **dedicated**

Start with the word *champion.*

1. Ask students, "Are there any other words you know that are similar to this word? *(Words that have the same root?)*"
2. Based on what students share, introduce a word family word you want students to learn how to use. In this case, introduce the word *championship*.
3. Below the Visual-Verbal Word Association boxes, write the new word. You can write the word inside a house to indicate that it's part of the same "family." Have students do the same on their own sheet.
4. Explain the difference between the original vocabulary word and this new word. For example, one might be a verb, and the other might be a noun.
5. Model how to use the word in a sentence. Have students think of their own sentence using the word, and have them write it on their own sheet.

For example:

champion *noun*	My soccer team was the **champion** at the World Cup.
a person who is the best in a competition; a person who succeeds	loser



championship
noun

My soccer team won the **championship**.

ELLs: Beginning and early intermediate ELLs can write the sentence in their native language if necessary, or very closely model their sentence on the teacher's example. You can also briefly meet with individual ELLs or a small group to help them write a sentence while the rest of the class writes their own.

GALLERY WALK:
Projects are taped to the wall around the room. Working teams visit each project with a specific goal for which to look, marking the project in some way (sticky notes, marks on paper, etc.). The walk is closed by the teacher and teams coming together and discussing what they found.

- What did they see that was different from what they had done themselves?
- What did they see that clarified a point for them?
- What did they see that they wanted to ask questions about?
- What notes were on their personal team's project they would like to address either as a "thank you for your thoughts," or as a clarifying statement about a question?

Invite someone local to the classroom who has gone to college. Before the person arrives, have the students prepare a list of questions to ask the person and who will ask each, questions about mentors, encouragement, discouragement, persistency, dedication, and any other questions they might have (screened through you, of course).

Classroom Lesson - continued

Students should place their completed organizers in their vocabulary binders.

Building Background - Literature

Write the following question so all students can see it: "What do you think would be Dr. Romo's advice for young people today?" Use evidence from the text to support your opinion.

Tell students that today they will be reading the biography with a partner, and as they read the text together, they should look for examples of what advice they think Dr. Romo would give young people today. Show students the T-Chart they can use to take notes while reading (see BLM T-Chart). Put an example on the T-Chart as a model for students to see how to use it. The T-Chart below has an example you could use.

Advice Dr. Romo might give	Why he would give that advice: Evidence from the text
Example: You should read all the time to become a better student.	When Ricardo worked in his family's store, he read the labels on cans to learn how to read in English and how to spell words.

Once students understand how to use the T-Chart, provide copies for each student or have them draw a simple T-Chart in their notebooks. Pair up students as reading partners, and give each partnership a copy of the text. Have them spread out to different areas of the room.

Classroom Lesson - continued

DURING READING
Comprehensible Input - Literature
Have the partners read the book together. To do this, they can alternate reading aloud a page.
ELLs: Beginning and early intermediate ELLs can be in a group of three, and listen as the other two students alternate reading aloud the text.

As partners read, they should add to the T-Chart. Circulate while students are working to help them include evidence from the text in the second column.

AFTER READING
Practice and Application - Literature
Regroup the class, and discuss the advice they think Dr. Romo would give young people today. As students share, help them include evidence from the text. You can give students the following sentence starter to help:

I think Dr. Romo would tell us to _____ **because**…

Reading Response
Have students write their own response to this question in a notebook, based on the class discussion and the ideas they wrote on their T-Charts. Circulate while students are working to help them include specific examples from the biography to support what they think.

Transition to Math

Share the findings from this morning's measurement lab *(if completed)*.
Questions

- Which cylinders take up more space? How do they know?
- Who had the largest cylinder, and how are they going to determine what largest means? *(Circumference? Diameter? Height?)* Reason and justify their thinking.
- After your cylinder exploration, could you solve similar area problems with cylinders that can NOT be cut apart? *(i.e., canned goods in a store, steam roller, pipe, tree trunk, etc.)*
- How did working in the store help Ricardo reason mathematically?

Objectives
Review both language and math objectives, making sure students understand how they accomplished each.

Reading Response

What do you think would be Dr. Romo's advice for young people today? Use evidence from the text to support your opinion.

Example: You should always read and learn new words to be a better student.	When Ricardo worked in his family's store, he read the labels on cans to learn how to read in English and how to spell words.

Respuesta a la lectura

¿Cuál crees que sería el consejo del Dr. Romo para los jóvenes de hoy? Usa evidencias del texto para apoyar tu opinión.

Ejemplo: Siempre debes leer y aprender nuevas palabras para ser un mejor estudiante.	Cuando Ricardo trabajó en la tienda de su familia, leía las etiquetas en las latas para aprender a leer en inglés y a deletrear palabras.

Materials
- 4-function calculator
- Grocery bag with 8 Pairs of canned vegetables

*Pair house-brand and name-brand cans of same soup but different quantity for comparison.

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
encouraged
disappointed
champion
dedication
mentor

ELPS:
3D, 3J, 5B

Technology Option
Students may use calculators to solve the problems.

Teacher Note
Please facilitate this partner discussion. It will be short, but should be active.

Discussion
As students quickly discuss, the teacher should listen to their use of the math vocabulary. Encourage proper usage.

Unit 1, Lesson 3 — Grades 7-8

Math Lesson

Math Objectives:
- Write rates as ratios with proper labels.
- Compare rates with unit rates and serving costs.
- Use patterns to find equivalent ratios.
- Use cross multiplication to solve for an unknown.

Language Objectives:
- Read food labels and price tags.
- Discuss problem solving strategies with peers.
- Write ratios, unit rates and serving costs for food items.

Building Background
After you have discussed today's math and language objectives, remind students that Ricardo helped his father in the grocery store. Mr. Romo was most likely very conscious of the UNIT RATE he was paying for his merchandise and charging his customers. Sometimes the only way you can tell which buy is the better deal is to consider the unit price of each. Today, we'll be looking at cans and determining unit price.

Comprehensible Input
***(TEACHER:** The can sizes and prices are merely examples. Please feel free to substitute whatever can sizes and prices you have available.)*

I have two cans of soup. One can is 18.5 ounces and cost me $.78. The second can of another brand holds 14.5 ounces and cost me $.59. Both soups are similar in that they serve two people. Without considering the taste of either soup, which can is the better bargain?

Talk to your partner about how you would solve this problem. Do not solve it right now, just talk about a solution strategy. *Allow students time to discuss solution strategies.*

There are several ways to solve this problem. I am going to find the UNIT RATE for each and compare them.

Soup #1: $\frac{\textbf{\$0.78 per}}{\textbf{18.5 oz}}$

I'll set up my ratio to find an EQUIVALENT RATIO for one ounce.

Math Lesson - continued

$$\frac{\textbf{\$0.78 per}}{\textbf{18.5 oz}} = \frac{x}{1}$$

Cross Multiply: **18.5*x* = .78**
Isolate the *x:* ***x* = .78 divided by 18.5**
I could divide this long hand, but I'm going to use my tool (calculator) **.04316.**

That rounds to **0.04**, or about **4 cents per ounce**.

(Follow the same format for finding the second UNIT RATE.)

$$\frac{\textbf{\$0.59 per}}{\textbf{14.5 oz}}$$

The second can of soup is 0.0406896 per ounce which also rounds to about four cents per ounce.

Even though the decimal for the second can of soup is smaller than the first can, both of these soups cost about the same when looking at the unit rate. So I guess I can choose these now based on my soup preference rather than the price!

Now let's go back and find out how much each SERVING costs. Soup #1 contains 18.5 ounces and serves two people. The can costs $.78. So how much does one serving cost? What do I do? *(quick pause)*

.78 divided by 2 = .39 per serving
How much soup will I get in one serving?
18.5 divided by 2 = 9.25 ounces

SO, my per serving ratio is $\frac{\textbf{\$0.39 per}}{\textbf{9.25 oz}}$

Let's do the same for soup can #2
.59 divided by 2 = 0.295
How much soup will I get in one serving?
14.5 divided by 2 = 7.25 ounces

My per serving ratio for Soup #2 is $\frac{\textbf{0.295 per}}{\textbf{7.25 oz}}$

How do these two ratios compare? What do you think? *(pause*) Again, I can cross multiply to find out. Cross multiplying is just a quick way of finding a common denominator. Remember in your Fraction Action today when you multiplied by a fraction representing ONE to find common denominators? Cross Multiplication is a short cut. I use it to

Technology Option
Students may use calculators to solve the problems.

Teacher Note
It is crucial that students understand HOW the common denominator is created before allowing them to utilize this "shortcut." Allow discovery time by writing the equation example on the board and asking, ***"How does this shortcut produce a common denominator? Why is the common denominator insignificant to this particular problem situation?"*** Brackets provided highlight where the common denominator is created when cross multiplying.

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compare because I do not have to add or subtract the quantities, just COMPARE them. So, I only multiply the numerator.

I could multiply 2.95/7.25 by 9.25/9.25 and I could use 7.25/7.25 to multiply the other ratio – but since I don't NEED to know the common denominator, I'm going to take the shortened step of just multiplying diagonally to find the two numerators. It's the same as cross multiplication.

$$\underset{\text{com den}}{\underline{2.8275}} \quad \frac{7.25}{7.25} \times \frac{0.39 \text{ per}}{9.25 \text{ oz}} \quad \frac{0.295 \text{ per}}{7.25 \text{ oz}} \times \frac{9.25}{9.25} \quad \underset{\text{com den}}{\underline{2.72875}}$$

This ratio is a tiny bit larger, but not much. Guess now it depends on how hungry I am!

Repeat the entire exercise for another pair, making sure that you pause momentarily and let students try to figure each unit rate.

During the Follow-up activity students will work with their group to determine the unit rates and serving cost for each pair in their grocery bags.

After you finish your team grocery bags activity, I'm going to teach you a game using the skills we've learned in this unit. (*Show the game board and dominoes.)* You're going to take that game home tonight to play with the family. All of your siblings will bring home the same game board, and you will all use dominoes to make your numbers. You'll just have different directions on what to use the dominoes for depending on your grade level. You probably won't have a calculator at home, but that's OK because the numbers will be much simpler to work with in the game!

MAS Space
You were asked to discuss the book and tell whether you liked the book or did not like the book and tell your reasons why. Please collect your thoughts and write a class letter to the author, Diane Gonzales Bertrand, making sure you reference specific events in the book, or specific emotions the book made you feel, or specific encouragement and inspiration the book gave you. Share your class letter on MAS Space.

Objectives
Read through the math and language objectives, making sure that the students understand how they accomplished each.

Materials
- Grocery bags and cans per team from Math Lesson
- **BLM** Canned Goods-Record Sheet
- Family Fun Generic Game Board
- Family Fun Movement Cards
- Unit 1Family Fun Problem Cards (green)
- Family Fun Answer Key (all grade bands)
- Unit 1Family Fun Special 7^{th} – 8^{th} Game Instructions
- dominoes (1 set per pair + 1 set per student to take home)
- 4-function calculator

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
encouraged
disappointed
champion
dedication
mentor

Unit 1, Lesson 3 — Grades 7-8

Follow-up

Math Objectives:
- Write rates as ratios with proper labels.
- Compare rates with unit rates and serving costs.
- Use any strategy to solve serving cost problems.

Language Objectives:
- Share and record can and label data with peers.
- Write ratios, unit rates and serving costs for food items.
- Explain problem solving strategy to peers.
- Explain how finding unit rates can be helpful for you and your family.

Practice and Application
Students complete the BLM Canned Goods-Record Sheet independently or in small groups.

You should not have to model today. Walk around the room asking questions to clarify, explain and extend.

QUESTIONS
- What do the numbers that you have written mean?
- How will you find the UNIT RATE?
- How will you compare the UNIT RATES?
- What information do you need to determine the cost of each serving?
- Why does cross multiplication work?
- When could you use cross multiplication?

When students have completed the practice pages, teach them how to play the **Family Fun Game** with **Family Fun Game Board**, **Special Instructions for 7-8**, and the dominoes. Send home the game today.

Recursive Review
None for today

Writing Topics
Independent Writing Topic
Students will have a daily writing activity which will incorporate the day's focus math vocabulary.

- **Explain how finding UNIT RATES can be helpful to you and your family.**

Unit 1, Lesson 3 — Grades 7-8

Follow-up - continued

Class Writing Topic

- I Learned/ I Still Don't Understand Chart

Today I learned . . .	I still don't understand . . .

Family Fun Game
Students will take the Family Fun game materials home to teach and play with their families.

Objectives
Review the math and language objectives to make sure that they were accomplished and that the students realize how they were accomplished.

Unit 1 Lesson 3 – Follow-up

One per student

Canned Goods – Record Sheet

Unit Price/Precio por unidad		Price per Serving/Precio por porción	
Can/Bote #1	Can/Bote #2	Can/Bote #1	Can/Bote #2

Unit 1 Lesson 3 – FAMILY FUN (Optional Activity)

One per student/family

What's In Your Pantry?

Students worked with canned goods today and found the unit prices for many items. Find three items in your home that still have the price marked on them. Work with your child to complete the following.

Item #1: _____

Cost: _____

Net Weight: _____

Fraction: _____

Unit Price: _____

Item #2: _____

Cost: _____

Net Weight: _____

Fraction: _____

Unit Price: _____

Item #3: _____

Cost: _____

Net Weight: _____

Fraction: _____

Unit Price: _____

Lección 3 – DIVERSIÓN FAMILIAR

¿Qué hay en su despensa?

Los estudiantes hoy trabajaron con productos envasados y aprendieron los precios unitarios para distintos artículos. Encuentre tres artículos en su hogar que todavía tengan el precio. Trabaje con su hijo(a) para completar lo siguiente.

Art. Nº 1 _____

Costo _____

Peso neto _____

Precio unitario _____

Art. Nº 2 _____

Costo _____

Peso neto _____

Precio unitario _____

Art. Nº 3 _____

Costo _____

Peso neto _____

Precio unitario _____

Materials
- 5 large string cheese
- 4 paper dessert plates
- 4 paper towels
- 4 plastic knives
- 4 pieces wax paper
- 4 pairs of scissors

All items listed above per partner pair
- **BLM** String Cheese-Snack Fractions

Math Objectives
- Use addition, subtraction, multiplication and division to solve problems involving fractions and decimals.
- Convert between fractions, decimals, whole numbers and percents.
- Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios).
- Estimate and find solutions to application problems involving percent.

Language Objectives
- Discuss fraction comparisons.
- Discuss fraction equivalencies.

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
encouraged
disappointed
champion
dedication
mentor

Unit 1, Lesson 3 — Grades 7-8

Snack Fractions

Students should wash their hands before this activity if using food items.

Snack Fractions
As part of each math day, please include a quick "Snack Fraction" activity. If your district/school does not allow any snacks to be given to students, please alter the activity by providing a paper shape to be divided into fractional parts.

Tell students that today you will share among four students. Distribute the five pieces of string cheese and other supplies to the groups of four and let them decide how to share the string cheese and how much of the set each person received.

When everyone is finished, distribute the **BLM** String Cheese Fractions. Students work in their groups of four to solve the problem. Use class time to discuss the strategies and solutions once all have finished.

Snack Fraction Journal Writing: BLM String Cheese Fractions
During the Snack Fractions activities for this unit you or your classmates may have noticed a relationship between the number of people the snack is being shared with and how many times the snack is "cut" or divided. Example: Three donuts are shared between four people.

Explain the relationship between the number of people eating the snack and how many times the snack was divided.

Objectives: Review the objectives with the class, making sure they understand how they achieved each.

Unit 1 Lesson 3 – Snack Fraction

One per student

String Cheese – Snack Fractions

My name is _____

Problem:

Enrique had five pieces of string cheese to share among himself and three of his brothers.

Questions:

1. What fractional portion of the set did each person receive?

2. How do you write one portion as a decimal?

3. What percent of the set did each person receive? Use a ratio to help you solve the problem.

Unit 1 Lesson 3 – Snack Fraction

One per student

String Cheese – Snack Fractions

Mi nombre es _____

Problema:

Enrique tiene 5 trocitos de queso para compartir él y tres de sus hermanos.

Preguntas:

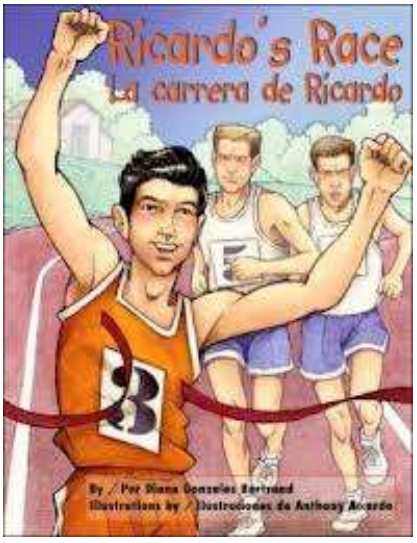
4. ¿Que parte fraccionaria recibió cada persona?

5. ¿Cómo escribes una porción como decimal?

6. ¿Qué porcentaje del set recibió cada persona? Usa una proporción para ayudarte resolver el problema.

Unit 1 Lesson 3 – Family Fun

Dear _____,



We continued our study of ratios today.

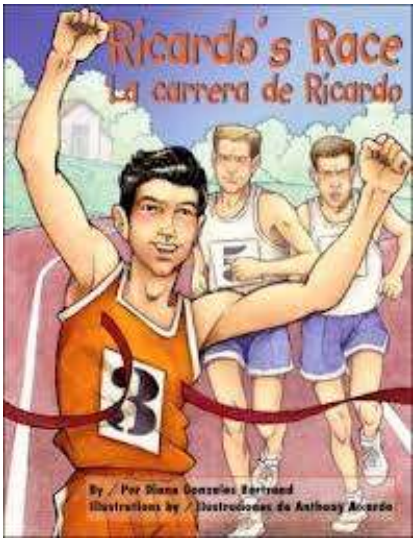
My teacher would like for us to:

- take a favorite recipe and show the family how to use ratios to increase the ingredients to serve 15 people.

Sincerely,

_____

Querido/a _____,



Continuamos con nuestros estudios de proporciones.

A mi maestro/o le gustaría que nosotros:

- revisar una receta favorita y hablar con la familia de cómo se usan las proporciones para aumentar las ingredientes para servir a 15 personas.

Atentamente,

_____

This portion of the curriculum is NOT required, but should be used to supplement and enrich the Unit's activities.

Family Fun Suggestion
Share the story with parents during a parent night. 7th grade was a turning point for Ricardo. Will it be for your students?

Enrichment Suggestions Grades 7-8

Unit 1 ***Ricardo's Race***

Math Walk

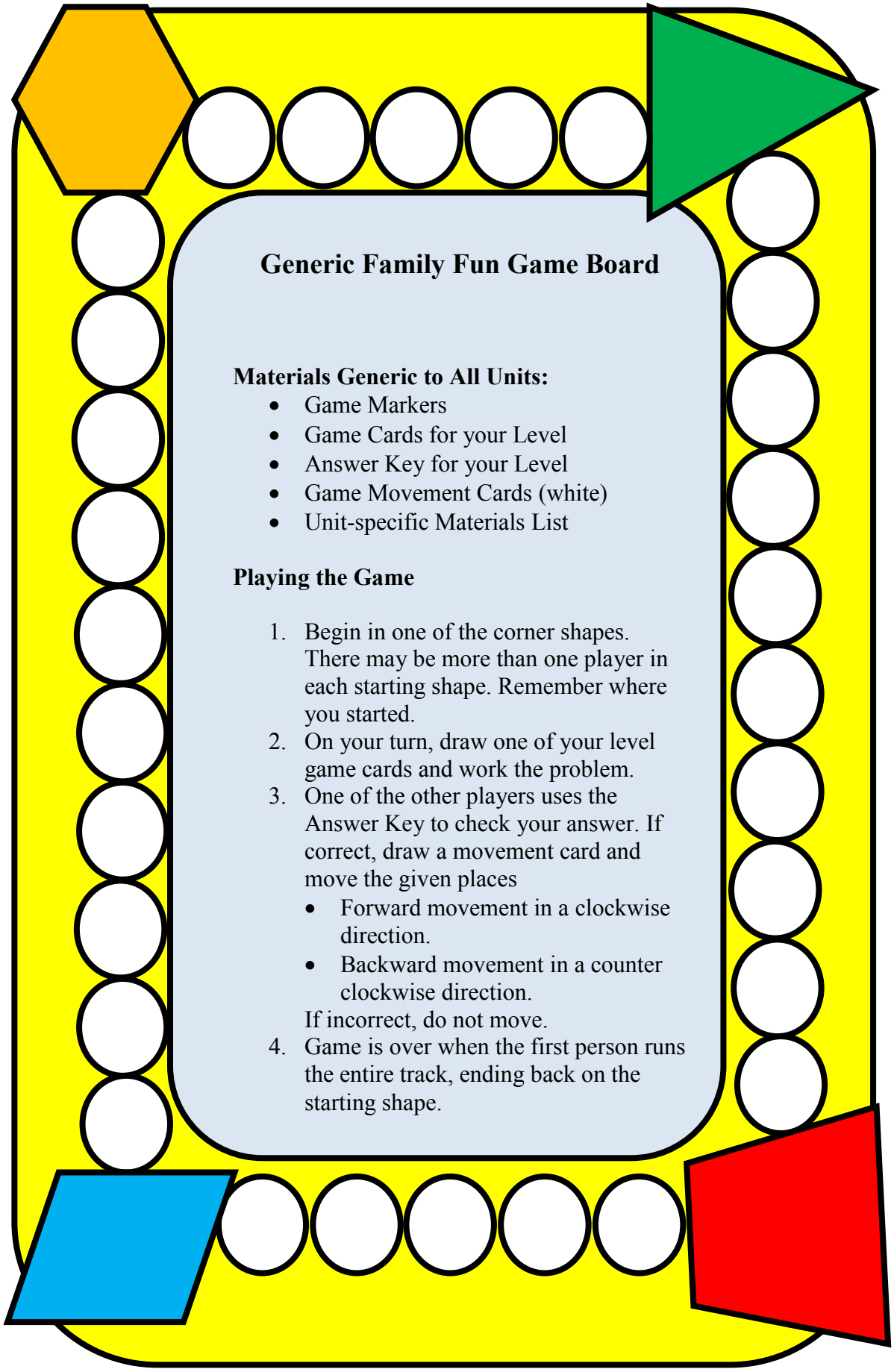
- Take your math walk early this unit to find an area suitable for the speed walk on day two.

Technology Connection

- More graphing experiences: many lesson plans, some appropriate for home use. http://fcit.usf.edu/math/lessons/lessons8.html
- Cool extension problems to the ratio unit. http://math.rice.edu/~lanius/proportions/

Other Content Area Tie-in

- **Social Studies:** Research the Hispanic influence in San Antonio. http://www.answers.com/topic/san-antonio-history?cat=travel http://www.sat.lib.tx.us/html/hispanic.htm http://www.yale.edu/ynhti/curriculum/units/1984/3/84.03.01.x.html (generic -- USA) http://www.orbitz.com/vacation-info/Texas/San-Antonio.html http://www.hispanicprwire.com/news.php?l=in&id=8374&cha=13 (Hispanic Media awards) http://www.hispanicheritage.org/images/press/San%20Antonio%20Press%20Release.pdf Hispanic Heritage Youth Awards 2006
- **Science:** Research safe running habits and develop a plan to help someone form a life habit of running or walking based on safe principles. http://www.tinajuanfitness.info/articles/art072998.html http://running.about.com/od/running101/ht/runningsafely.htm http://www.runtheplanet.com/trainingracing/safety/ http://www.ehow.com/how_14504_trail-run-safely.html
- **Art:** Create an Hispanic art project. Some ideas found in these links: http://www.princetonol.com/groups/iad/Files/mexico.htm http://www.hispaniconline.com/hh02/education_celeb_hisp_heritage_school_elem.html



Generic Family Fun Game Board

Materials Generic to All Units:

- Game Markers
- Game Cards for your Level
- Answer Key for your Level
- Game Movement Cards (white)
- Unit-specific Materials List

Playing the Game

1. Begin in one of the corner shapes. There may be more than one player in each starting shape. Remember where you started.
2. On your turn, draw one of your level game cards and work the problem.
3. One of the other players uses the Answer Key to check your answer. If correct, draw a movement card and move the given places
   - Forward movement in a clockwise direction.
   - Backward movement in a counter clockwise direction.

   If incorrect, do not move.
4. Game is over when the first person runs the entire track, ending back on the starting shape.

Tablero de juego

Materiales genéricos para todas las unidades:

- Fichas para jugar
- Tarjetas del juego para su nivel
- Clave de respuestas para su nivel
- Tarjetas de movimiento del juego (blancas)
- Lista de materiales específicos de la unidad

Cómo se juega

1. Empiece en una de las esquinas. Puede haber más de
1 jugador en cada figura de inicio.
2. Cuando sea su turno, saque una de las tarjetas de
juego de su nivel y resuelva el problema.
3. Uno de los otros jugadores usa la clave de respuestas
para ver si su respuesta es correcta. Si es correcta, saque una tarjeta de movimiento y mueva su ficha como lo indica la tarjeta.
   - Movimiento hacia adelante en el sentido de las manecillas del reloj.
   - Movimiento hacia atrás en el sentido contrario a las manecillas del reloj.

   Si es incorrecta, no se mueve.
4. El juego se acaba cuando la primera persona recorre
toda la pista y termina en la figura de inicio.

BLM All-School Unit 1, Lesson 3 **Family Fun Game**

Answer Key

Problem Letter	Kinder	1-2	3-4	5-6	7-8
A	This coin is a quarter.	(listen to the skip counting)	x x x x x x x x x x x x	633.29 miles	$\frac{22 \text{ boys}}{30 \text{ girls}}$
B	This coin is a dime.	(listen to the skip counting)	x x x x x x	$3237.88	$\frac{15 \text{ girls}}{26 \text{ total}}$
C	This coin is a penny.	(listen to the skip counting)	x x x x x x x x x x	perimeter = 99.5 meters	$\frac{14 \text{ boys}}{33 \text{ total}}$
D	This coin is a quarter.	5 cents	3 x 5 = 15	width = 10.75 meters	$\frac{21 \text{ red}}{33 \text{ total}}$
E	This coin is a dime.	10 cents	2 x 5 = 10	334.325 yards	6 cups of flour
F	This coin is a penny.	1 cent	2 x 3 = 6	$451.09	$\frac{1}{4}$ cup of onions
G	This coin is a nickel.	25 cents	There were 4 nickels in each bank.	$35 for each yard	12 cups of flour
H	This coin is a nickel.	14 nickels	There were 2 stacks of 5 nickels.	$2800	$12\frac{1}{2}$ cups sugar
I	This coin is a dime.	11 quarters	any model equivalent to 1/2	$744	11.5 oz of chocolate
J	Benny had 4 pennies.	19 pennies	4.05	$205	16 baskets
K	Benny had 2 pennies.	11 pennies	27.12	$675	20 baskets
L	Benny had 4 pennies.	4 pennies	3 5/10 or 3 1/2	$11.75 per hr	Same. Ratios are equivalent at 2:3
M	Benny had 5 pennies.	3 pennies	Four and twenty-three hundredths	$660 (double $330)	12 blue
N	Benny had 5 pennies.	7 pennies	2 tenths	$165 (half of $330)	18 red
O	Benny had 0 or no pennies.	14 pennies	4 tenths	x = $100 (double 25, double 50)	16 yellow
P	(counts out 15 pennies)	Make a group of 5 and a group of 6	1.5 < 1.75 Less than	x = 56 (half of 112)	$72.00
Q	(counts out 12 pennies)	Make a group of 8 and a group of 8	1.51 > 1.49 Greater than	$412.50 (half of $825)	50 minutes
R	(counts out 20 pennies)	Show 12 pennies and remove 6.	1.2 > 1.02 Greater than	$150 (50% = $100, 25% = $50, combine)	Alicia – She runs $1\frac{2}{3}$ blocks per min.

Units 1 – 2 – 3 -- FAMILY FUN

One per student for home
One per partner pair in class

*Print on **white** paper.*

Family Fun – Movement Cards

Move forward 1 space	**Move forward 1 space**	**Move forward 1 space**
Move forward 1 space	**Move forward 1 space**	**Move forward 1 space**
Move forward 2 spaces	**Move forward 2 spaces**	**Move forward 2 spaces**
Move back 1 space	**Move back 1 space**	**Move back 1 space**
Move forward 3 spaces	**Move forward 2 spaces**	**Move forward 3 spaces**

Units 1 – 2 – 3 -- FAMILY FUN

One per student for home
One per partner pair in class

*Print on **white** paper.*

Family Fun – Movement Cards

Avanza un espacio	**Avanza un espacio**	**Avanza un espacio**
Avanza un espacio	**Avanza un espacio**	**Avanza un espacio**
Avanza 2 espacios	**Avanza 2 espacios**	**Avanza 2 espacios**
Retrocede 1 espacio	**Retrocede 1 espacio**	**Retrocede 1 espacio**
Avanza 3 espacios	**Avanza 3 espacios**	**Avanza 3 espacios**

Units 1 Lesson 3 – FAMILY FUN

One per student for home
One per partner pair in class

*Print on **goldenrod** paper.*

Family Fun – Problem Cards (1 of 2)

A. What is the ratio of 11 boys to 15 girls? What would you expect the ratio to be if there were 30 girls in an equivalent proportion?	**B**. If there are 11 boys and 15 girls, what is the ratio of girls to the total number of students?	**C**. If there are 14 boys and 19 girls, what is the ratio of boys to the total number of students?
D. If there are 21 red flags and 12 blue flags, what is the ratio of red flags to the total number of flags?	**E**. A recipe feeding 4 people calls for 1.5 cups of flour. How much flour is needed to make a recipe to feed 16 people?	**F**. A recipe feeding 8 people calls for 1 cup of onions. How many cups of onions would be needed to feed only 2 people?
G. A recipe feeding 2 people calls for 1.5 cups of flour. How much flour is needed to make a recipe to feed 16 people?	**H**. A recipe feeding 4 people calls for 2.5 cups of sugar. How much sugar is needed to make a recipe to feed 20 people?	**I**. A recipe feeding 12 people calls for 5.75 ounces of chocolate. How much chocolate is needed to make a recipe to feed 24 people?

Units 1 Lesson 3 – FAMILY FUN

One per student for home
One per partner pair in class

*Print on **goldenrod** paper.*

Family Fun – Problem Cards (1 of 2)

A. ¿Cuál es la relación de 11 niños a 15 niñas? ¿Cuál esperarías que fuera la relación si hubiera 30 chicas en una proporción equivalente?	**B**. Si hay 11 niños y 15 niñas, ¿cuál es la relación de chicas al número total de estudiantes?	**C**. Si hay 14 niños y 19 niñas, ¿cuál es la relación de chicos al número total de estudiantes?
D. Si hay 21 banderas rojas y 12 banderas azules, ¿cuál es la relación de banderas rojas al número total de banderas?	**E**. Una receta que rinde para 4 personas pide 1.5 tazas de harina. ¿Cuánta harina se necesita para hacer que la receta rinda para 16 personas?	**F**. Una receta que rinde para 8 personas pide 1 taza de cebollas. ¿Cuántas tazas de cebollas se necesitarían para alimentar a sólo 2 personas?
G. Una receta que rinde para 2 personas pide 1.5 tazas de harina. ¿Cuánta harina se necesita para hacer que la receta rinda para 16 personas?	**H**. Una receta que rinde para 4 personas pide 2.5 tazas de azúcar. ¿Cuánta azúcar se necesita para hacer que la receta rinda para 20 personas?	**I**. Una receta que rinde para 12 personas pide 5.75 onzas de chocolate. ¿Cuánta chocolate se necesita para hacer que la receta rinda para 24 personas?

Units 1 Lesson 3 – FAMILY FUN

One per student for home
One per partner pair in class

*Print on **goldenrod** paper.*

Family Fun – Problem Cards (2 of 2)

J. If a player's free-throw average is 4:7, how many baskets would be expected from 28 throws?	**K**. If a player's free-throw average is 4:5, how many baskets would be expected from 25 throws?	**L**. If one player's free-throw average is 2:3, and another's is 6:9, which player would be expected to make more baskets in 12 throws?
M. Pamela selected paint with a color ratio of 3 blue to 7 white for 2 gallons. How much blue is needed to match the color for 8 gallons of paint?	**N**. The ratio of red to yellow in one shade of orange is 6 to 9. If there are 27 drops of yellow, how many drops of red are needed?	**O**. The ratio of blue to yellow in one shade of green is 7 to 8. If there are 14 drops of blue, how many drops of yellow are needed?
P. T-shirts are on sale 5 for $12. At that price, what would 30 t-shirts cost?	**Q.** Alicia can run 3.1 miles in 25 minutes. At that speed, how long will it take her to run 6.2 miles?	**R.** Martin can run 4 blocks in 2 minutes. Alicia runs 5 blocks in 3 minutes. Who runs faster? How do you know?

Units 1 Lesson 3 – FAMILY FUN

One per student for home
One per partner pair in class

*Print on **goldenrod** paper.*

Family Fun – Problem Cards (2 of 2)

J. Si el promedio en tiros libres de un jugador es de 4:7, ¿cuántas canastas se esperarían de 28 tiros?	**K**. Si el promedio en tiros libres de un jugador es de 4:5, ¿cuántas canastas se esperarían de 25 tiros?	**L**. Si el promedio en tiros libres de un jugador es 2:3 y el de otro es 6:9, ¿cuál jugador se esperaría que enceste más veces en 12 tiros?
M. Pamela seleccionó pintura con una relación de color de 3 azules a 7 blancos para 2 galones. ¿Cuánto azul se necesita para igualar el color para 8 galones de pintura?	**N**. La relación de rojo a amarillo en un matiz de anaranjado es de 6 a 9. Si hay 27 gotas de amarillo, ¿cuántas gotas de rojo se necesitan?	**O**. La relación de azul a amarillo en un matiz de verde es de 7 a 8. Si hay 14 gotas de azul, ¿cuántas gotas de amarillo se necesitan?
P. Las camisetas están en oferta de 5 por $12. A ese precio, ¿cuánto costarían 30 camisetas?	**Q.** Alicia puede correr 3.1 millas en 25 minutos. A esa velocidad, ¿cuánto tardará en correr 6.2 millas?	**R.** Martin puede correr 4 manzanas en 2 minutos. Alicia corre 5 manzanas en 3 minutos. ¿Quién corre más rápido? ¿Cómo lo sabes?

Special 7th – 8th Game Instructions

Materials:

- Family Fun Generic Game Board
- Family Fun Movement Cards
- Unit 1 Family Fun Problem Cards (green)
- Family Fun Answer Key from Unit 1 (all grade bands)
- Unit 1 Family Fun Special 7th – 8th Game Instructions

Solution Expectations

Problems A – R

All of the problems are asking students to find equivalent ratios, but the situations are quite different. It is important for students to understand that even though the context of the problem situations vary between ratios of people and things, price, and rates, solving them is essentially the same.

The numbers chosen for these problems are compatible and shouldn't need laborious efforts to calculate. Simple number sense and relationships should allow students to calculate the answer mentally or with very little work.

Card P:

T-shirts are on sale 5 for $12. At that price, what would 30 t-shirts cost?

Students need to keep track of their units/labels when writing the ratio in fraction form.

$$\frac{\textbf{5 shirts}}{\textbf{\$12}} = \frac{\textbf{30 shirts}}{\textbf{\$ } x}$$

Solution Strategy: I know to get from 5 shirts to 30 shirts I have to multiply by 6. In other words, I have 6 groups of 5 shirts. If each group of 5 shirts costs $12, then 6 groups of $12 will equal $72. Basically, you take the ratio of 5:12 and multiply the numerator and denominator by 6 to find your answer.

Instrucciones especiales de juego para 7º – 8º

Materiales:

- Tablero de juego genérico de Diversión Familiar
- Cartas de movimiento de Diversión Familiar
- Cartas de problemas de Diversión Familiar de la Unidad 1 (verdes)
- Guía de respuestas de Diversión Familiar para la Unidad 1 (todos los grados)
- Instrucciones especiales de Diversión Familiar Unidad 1 para 7º – 8º

Expectativas de solución

Problemas A – R

Todos los problemas piden a los estudiantes que encuentren relaciones equivalentes, pero las situaciones son muy diferentes. Es importante que los estudiantes entiendan que aun cuando el contexto de las situaciones de los problemas varíe entre relaciones de personas y cosas, precios y tasas, el modo de resolverlos es esencialmente el mismo.

Los números elegidos para estos problemas son compatibles y los cálculos no deben ser laboriosos. Un simple sentido de los números y las relaciones debe permitir a los estudiantes calcular la respuesta mentalmente o con muy poco trabajo.

Carta P:

Las camisetas están en oferta de 5 por $12. A ese precio, ¿cuánto costarían 30 camisetas?

Los estudiantes deben estar al tanto de sus unidades/etiquetas al escribir la relación en forma de fracción.

$$\frac{\textbf{5 shirts}}{\textbf{\$12}} = \frac{\textbf{30 shirts}}{\textbf{\$ x}}$$

Estrategia de Solución: Sé que para ir de 5 camisetas a 30 camisetas tengo que multiplicar por 6. En otras palabras, tengo 6 grupos de 5 camisetas. Si cada grupo de 5 camisetas cuesta $12, entonces 6 grupos de $12 equivaldrán a $72. Básicamente, tomas la relación de 5:12 y multiplicas el numerador y el denominador por 6 para encontrar la respuesta.

Math Matters 2014 – In-Home Instruction

Math Objectives

Math Lesson 1

- Write rates as ratios *(fractions)* with proper labels.
- Compare rates with unit rates.
- Draw a visual representation to compare two ratios.
- Use a pattern to find equivalent ratios.
- Use cross multiplication to solve for an unknown.
- Create a graph to solve a rate problem.

Math Lesson 3

- Write rates as ratios with proper labels.
- Compare rates with unit rates and serving costs.
- Use patterns to find equivalent ratios.
- Use cross multiplication to solve for an unknown.

Students should also be administered the Pre-assessment.

Differentiate

From the math objectives listed above, select the instruction your student needs.

Snack Fraction Notice

All snack fractions are common throughout the grade bands. All grade bands have daily snack fraction activities provided. All snack fractions for a unit in a specific grade band will practice the same set of skills. Therefore, you may choose from any of the three activities. **Lesson 1** has been suggested for this Unit in all grade bands for its ease of delivery.

Materials

Math Lesson 1

- **BLM** Rate Chart
- **BLM** Ricardo's Rate
- **BLM** Grid
- Straight edge
- 4-function calculator (optional)

Math Lesson 3

- 4-function calculator
- Grocery bag with 8 pairs of canned vegetables
- *Pair house-brand and name-brand cans of same soup but different quantity for comparison.

Family Fun

- Family Fun Generic Game Board #1
- Family Fun Movement cards
- Unit 1 Family Fun-Problem Cards
- Family Fun Answer Key from Unit 1 (all grade bands)
- Unit 1 Family Fun Special 7^{th} – 8^{th} Game Instructions
- Game markers
- 4-function calculator

Snack Fractions (Math Lesson 1)

- 1 large apple per pair
- 2 paper dessert plates
- 2 paper towels
- 1 plastic knife
- 2 small pieces wax paper
- 2 pair scissors

All items listed above per partner pair

- **BLM** Apple Snack Fractions

Math Matters 2014 – In-Home Instruction

QUESTIONING

As a result of this lesson, your students should be able to respond to the following:

- What is a ratio?
- What is a unit rate?
- Explain how to find equivalent ratios
- How does a graph help you find equivalent ratios? Unit rates?
- What did you visualize when you first looked at the problems to estimate a reasonable answer?
- Which method of solving for equivalent ratios do you prefer? Why?
- Does the type of problem and the ratios involved make any difference in the type of strategy you would use? Explain.

Math Vocabulary

ratio, equivalent, rate, unit rate

CGI Problem

- rates

Journal Writing

Explain how to use one strategy for finding unit rates.

Family Fun

A generic game board is being used in all grade levels, differentiated by game cards specific to the grade level.

Snack Fractions

Students divide their snack into varying portions and determine the fraction, decimal, and percent of each.

Assessment

Students will be introduced to and practice skills for items 6a,b,c; 7

Grades 7-8 Overview

Unit 2, Lesson 1 *Zack Proton and the Wrong Planet*

This is a quick snapshot of each of the three math lessons for this unit. For detailed instructions, balanced literacy objectives and enrichment ideas, refer to the complete lesson plans for each lesson.

Lesson Segment	Math Objectives	Language Objectives	Activity	Manipulatives	Supplies
Unit 2, Lesson 1 Daily Routine 30 – 45 minutes	Solve word problems using a variety of strategies and defend their strategies. Model and solve 2-step word problems. Compose and decompose values to show a new representation of the value. Find equivalent fractions.	Speak to partners, teacher, and class using vocabulary. Discuss problem solving process and strategies. Explain how they decided to rename the target number.	**Essential:** • Measurement Lab • Solve It! Problems • Fraction Action • *X* Marks the Spot • CGI **Optional:** • Target Number 48 • Graphing • Money Matters	• cardboard boxes (easy to cut apart such as cereal, shirt, etc.) • ruler	• **BLM** Measurement Lab-Rectangular Prism Record Sheet • Scissors • Plain paper /pencil • 1" Grid paper • **BLM** Solve It! Problems 1-2 • **BLM** Fraction Action and *X* Marks the Spot • **BLM** CGI-***Zack Proton and the Wrong Planet***
Classroom *Lesson 1* 30 min. – 1 hour	Discuss and share length and width measurements of rectangles. Discuss and share area calculations using measurements. Discuss and share area calculations using arrays. Create a construction (model) using defective items.	Discuss outer space with peers. Discuss construction (model) with peers. Read and listen to ***Zack Proton and the Wrong Planet***.	**Vocabulary** Create construction using defective items and describe. **Literature** Read portion of book, enjoying comic genre. **Transition to Math** Students connect ratios and rates to literature read during the Classroom Lesson.	• Bag or box of defective items such as: broken plastic ware, broken toys, broken sticks, flat balls, bottle corks, broken lids, small cylinders or prism with holes, etc. – anything that unless repaired could no longer be used for original purpose – they are DEFECTIVE.	• Word Web technology such as ***Inspirations*** (optional) • **BLM** Vocabulary word cards • **BLM** Vocabulary Construction 1 per student • Classroom Lesson • Vocabulary cards 1 set per student • Masking tape, glue, string • Scraps of Construction paper, wrapping paper, foil, plastic wrap, colorful cardboard • Box or cylinder or jug • Spools or other round items • Markers or crayons • Classroom set of literature books

Math ***Lesson 1*** 30 minutes	Use grid paper to measure length and width of rectangles. Calculate area of rectangles. Compare areas (equivalent ratios) using visual representations, patterns, and cross multiplication.	Discuss strategies to determine areas and equivalent ratios. Explain personal strategies used to find equivalent ratios.	**Vocabulary** Use vocabulary pervasively in the lesson, including literature vocabulary (see suggestions in side bar of lesson). **Mathematics** Teach several methods for finding equivalent ratios.	• customary ruler	• Scissors • Tape • Math Lesson vocabulary cards • **BLM** Piggy Spaces cut-outs with border • **BLM** Piggy Spaces-Practice Problems
Follow-up ***Lesson 1*** 30 min. – 1 hour *(including Snack Fractions)*	Choose a strategy to compare areas. Use equivalent ratios to solve problems.	Discuss strategies used to determine areas and equivalent ratios with peers. Explain the strategy used to find equivalent ratios. Write about your knowledge of equivalent ratios.	Continue the lesson, modeling another problem before circulating the room to assure students understand the problems and how to set up ratios. **Writing Prompt** What do I know about equivalent ratios?	• dominoes (1 set for 4 students) • dice (1 per 4 students)	• **BLM** Piggy Spaces Record Sheet • **BLM** Domino Blast Off Directions • **BLM** Domino Blast Off Game Board • Game markers • **BLM** Multiplication Chart-Equivalent Ratios • **BLM** Recursive Review Problems Lessons 1-3
Snack Fractions ***Lesson 1***	Use add., sub., mult. and div. to solve problems involving fractions and decimals. Convert between fractions, decimals, whole numbers and percents. Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios). Estimate and find solutions to application problems involving percent.	Discuss fraction comparisons. Discuss fraction equivalencies. Adding and subtracting like-denominators.	Students will work in pairs and explore fraction, decimal, and percent concepts through fair-sharing veggies and dip.	• 1 cup guacamole or other dip • 6 carrots (small) • 2 half-cup measuring cups • 2 plastic spoons • 2 paper dessert plates • 2 paper towels *All items listed above per partner pair*	• **BLM** Dip 'n Veggies-Snack Fractions

Grades 7-8 Overview

Unit 2, Lesson 2 *Zack Proton and the Wrong Planet*

This is a quick snapshot of each of the three math lessons for this unit. For detailed instructions, balanced literacy objectives and enrichment ideas, refer to the complete lesson plans for each lesson.

Lesson Segment	Math Objectives	Language Objectives	Activity	Manipulatives	Supplies
Unit 1 Lesson 2 Daily Routine 30 – 45 minutes	Solve word problems using a variety of strategies and defend their strategies. Model and solve 2-step word problems. Compose and decompose values to show a new representation of the value. Find equivalent fractions.	Speak to partners, teacher, and class using vocabulary. Discuss problem solving process and strategies. Explain how they decided to rename the target number.	**Essential:** • Measurement Lab • Solve It! Problems • Fraction Action • *X* Marks the Spot • CGI **Optional:** • Target Number 20 • Graphing • Money Matters	• cardboard cylinders (easy to cut apart such as cereal, shirt, etc.) • ruler • Fraction Math Balance	• **BLM** Cylinders-Measurement Lab Record Sheet • scissors • plain paper and pencil • 1" grid paper • **BLM** Solve It! Problem 3 • **BLM** Fraction Action and *X* Marks the Spot
Classroom *Lesson 2* 1 – 1.5 hours	Observe and find patterns within an equivalent ratios chart.	Explain how to use a multiplication chart to find equivalent fractions. Discuss and share vocabulary word associations with peers. Tell classmates your favorite part of ***Zack Proton and the Wrong Planet***. Read and listen to ***Zack Proton and the Wrong Planet***. Discuss with peers the patterns within an equivalent ratios chart.	**Vocabulary** Create Word Association charts. **Literature** Could also listen to the author's rendition of one of the chapters. Play Domino Blast Off Game & discuss patterns in the suggested equivalent ratios BLM. **Transition to Math** Students connect equivalent ratios to literature through the Domino Blast-Off Game.	• set of dominoes per group	• **BLM** Lesson 2, 3 Word Association Charts • Domino Blast-Off Game

Math ***Lesson 2*** 30 minutes	Convert measurements in order to have consistent units for solving equivalent ratios. Estimate area of rectangles (the size of Vietnamese Pigs). Calculate area of rectangles (the size of Vietnamese Pigs). Set up a ratio involving an unknown (x). Use any strategy to solve for an equivalent ratio.	Discuss problem solving strategies with peers. Explain how to convert one unit of measure to another unit of measure. Explain your personal problem solving strategy to peers.	**Vocabulary** Use vocabulary pervasively in the lesson, including literature vocabulary (see suggestions in side bar of lesson). **Mathematics** Teach several methods for finding equivalent ratios.	• 4-function calculator	• pencil and paper • 3ft x 1.25ft paper
Follow-up ***Lesson 2*** 30 – 45 minutes	Create a rectangle that will have dimensions (length and width) and area representing Hogzilla. Set up a ratio involving an unknown (*x*). Use any strategy to solve equivalent ratios. Make estimates and measurements to compare Hogzilla's area with the area of another object.	Discuss problem solving strategies with peers. Explain problem solving strategies to peers. Talk about the size of Hogzilla and how it compares to the size of other objects. Write about the usefulness of equivalent ratios in comparing size of objects.	Continue the lesson, but using dimensions of Hogzilla, a monster pig, to help students understand how to set up and use ratios to solve problems. **Writing Prompt** How did knowing about EQUIVALENT RATIOS help you solve today's follow-up problems?	• yard stick	• **BLM** Hogzilla • **BLM** Recursive Review • Problems (found in Lesson 1) • 3ft x 12ft of butcher paper
Snack Fractions ***Lesson 2***	Use add., sub., mult. and div. to solve problems involving fractions and decimals. Convert between fractions, decimals, whole numbers and percents. Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios). Estimate and find solutions to application problems involving percent.	Discuss how ratios and proportions can be used to solve real-world problems.	Students will work in pairs and explore fraction, decimal, and percent concepts through sharing trail mix.	• 1 large ice cream sandwich • 2 paper dessert plates • 2 paper towels • 1 plastic knife • 2 pieces wax paper • 2 pair of scissors *All items listed above per partner pair*	• **BLM** Trail Mix-Snack Fractions

Grades 7-8 Overview

Unit 2, Lesson 3 *Zack Proton and the Wrong Planet*

This is a quick snapshot of each of the three math lessons for this unit. For detailed instructions, balanced literacy objectives and enrichment ideas, refer to the complete lesson plans for each lesson.

Lesson Segment	Math Objectives	Language Objectives	Activity	Manipulatives	Supplies
Unit 2 Lesson 3 Daily Routine 30 – 45 minutes	Solve word problems using a variety of strategies and defend their strategies. Model and solve 2-step word problems. Compose and decompose values to show a new representation of the value. Find equivalent fractions.	Speak to partners, teacher, and class using vocabulary. Discuss problem solving process and strategies. Explain how they decided to rename the target number.	**Essential:** • Measurement Lab • Solve It! Problems • Fraction Action • *X* Marks the Spot • CGI **Optional:** • Target Number 100 • Graphing • Money Matters	• Set of 5 fruits or vegetables per group of 4 students. (Ex: 5 turnips of differing sizes.)	• **BLM** Solve It! Partner #1-Problem 4 1 per pair • **BLM** Solve It! Partner #2-Problem 5 1 per pair • **BLM** Fraction Action and *X* Marks the Spot 1 per student • tape measure • chart paper • grid paper • markers • 4 function calculator • **BLM** Percent Increase in Size-Measurement Lab Record Sheet
Classroom *Lesson 3* 1 – 1.5 hours	Share dimensional measurements of objects with peers. Use any strategy to find equivalent ratios.	Discuss and share vocabulary word associations with peers. Tell classmates your favorite part of ***Zack Proton and the Wrong Planet.*** Read and listen to ***Zack Proton and the Wrong Planet.*** Name equivalent ratios in the domino game.	**Vocabulary** Create a Word Association chart for two of the vocabulary words. **Literature** Listen to the rest of the book, commenting on favorite parts of the book. **Transition to Math** Play Domino Blast-Off		• **BLM** Lesson 2, 3 Word Association Charts • Domino Blast-Off Game

Math ***Lesson 3*** 30 minutes	Measure and record the dimensions of a child-sized T-shirt. Set up equivalent ratios involving an unknown *x*. Work with peers to solve equivalent ratios using any strategy. Draw a proportional object on graph paper using appropriate units *(or values)*.	Discuss strategies to set up equivalent ratios involving an unknown *x*. Explain problem solving strategies to peers. Write measurements with appropriate units. Talk about and compare the size *(dimensions)* of different objects.	**Vocabulary** Use vocabulary pervasively in the lesson, including literature vocabulary (see suggestions in side bar of lesson). **Mathematics** Find measures of shrunken spacesuit based on ratio of child's size 6 jump suit.	• customary ruler (inches) • tape measures • 4-function calculator	• **BLM** Omega Chimp Suit Measurements 1 per student • **BLM** "My 6-inch Spacesuit" 1 per student • pencil and paper • inch-grid paper • Child's size 6 jump suit, long sleeves and long legs (1 for teacher to use as model)
Follow-up ***Lesson 3*** 30 – 45 minutes	Measure and record the dimensions of a child-sized T-shirt. Set up equivalent ratios involving an unknown *x*. Work with peers to solve equivalent ratios using any strategy. Draw a proportional object on graph paper using appropriate units (or values).	Discuss problem solving strategies with peers. Explain our problem solving strategy to peers. Talk about the size of their suit and how it compares to the size of their peers. Write about the usefulness of equivalent ratios in comparing size of objects.	Continue the lesson, circulating the room to assure students understand the problems and how to set up ratios. **Writing Prompt** How did knowing about EQUIVALENT RATIOS help you solve today's follow-up problems?	• customary ruler (inches) • 4-function calculator	• **BLM** "My 6-inch Spacesuit" • pencil and paper • inch-grid paper • tape measures

Snack Fractions ***Lesson 3***	Use add., sub., mult. and div. to solve problems involving fractions and decimals. Convert between fractions, decimals, whole numbers and percents. Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios). Estimate and find solutions to application problems involving percent.	Discuss how ratios and proportions can be used to solve real-world problems.	Students will work in pairs and explore fraction, decimal, and percent concepts working with recipe measurements.	• 1 cup cherry tomatoes • 1 cup cheese cubes • 2 half-cup measuring cups • 2 paper dessert plates • 2 paper towels • copy of grocery receipt for this snack purchase *All items listed above per partner pair*	• **BLM** Tomatoes and Cheese-Snack Fractions

Project SMART/Math MATTERS 2014

Grade Level: 7-8	Unit 2 / Lessons 1 – 2 – 3

Daily Routine Math Objectives:
Model and solve situational problems with fractions using pictures, numbers and words.
Measure to find surface area of rectangular prisms and cylinders.
Measure circumference of 3-D, compare and find percent of increase and decrease.
Solve situation problems involving whole numbers in all operations.
Solve for X.

Daily Routine Language Objectives:
Listen, read, speak, and write the problem.
Listen to, read, speak and write about measurement vocabulary.
Speak to partners, teacher, and class using vocabulary introduced in the Daily Routines.

Unit Math Objectives:
Connect ratio to multiplication by observing and finding patterns within an equivalent ratios chart.
Solve single and multi-step problems involving ratios and equivalent ratios.
Find area using arrays and the area formula.
Compare equivalent ratios, areas, and sizes of different objects using visualization, estimation, patterns and cross multiplication.
Use grid paper to measure dimensions of objects.
Choose strategies to solve problems including comparing areas, sizes and equivalent ratios.
Convert measurements into different units.
Set up ratios involving an unknown (x).
Create a rectangle that has dimensions similar to an object.

Unit Language Objectives:
Discuss problem solving strategies with peers.
Explain problem solving strategies with peers.
Describe construction to peers.
Discuss outer space with peers.
Write about your knowledge of equivalent ratios.
Read word problems.
Write out solutions for solving equivalent ratio problems.
Speak to peers using math and literature vocabulary words.
Explain how to use a multiplication chart to find equivalent ratios.
Discuss and share vocabulary word associations with peers.
Read and listen to ***Zack Proton and the Wrong Planet***.
Tell classmates your favorite part of ***Zack Proton and the Wrong Planet***.
Explain how to convert one unit of measure to another unit of measure.
Talk about and compare the size of objects
Write about the usefulness of equivalent ratios in comparing the size of objects.

Technology Objectives:
Use research skills and electronic communication, with appropriate supervision, to create new knowledge.

Vocabulary
Math: ratio, equivalent, rate, unit rate
***Language*:** construction, volume, defective, expensive, impossible

Resources/Literacy Links
Zack Proton and the Wrong Planet by Brian Anderson

Lesson Sequence

- Daily Routine: 30 – 45 minutes
- Classroom Lesson: 30 minutes - 1 hour
- Math Lesson: 30 minutes
- Classroom Follow-up including Independent Writing: 30 minutes - 1 hour

Enrichment Activities – These are BEYOND EXPECTATION

Math Extensions:

Graph: Birthday graphing idea
Math Walk: Find and measure a large area on campus, then calculate the Hogzillas it would take to cover the area.
Graphing Experiences: http://fcit.usf.edu/math/lessons/lessons8.html
Extensions to Ratio Problems: http://math.rice.edu/~lanius/proportions/

Strand Extensions:

Social Studies: People live for extended periods on the International Space Station. Investigate how life would be different on the space station than it would be living with your family.
http://www.nasa.gov/mission_pages/station/main/index.html one of hundreds of sites
Science: What are some of the modern conveniences that have been invented because of space travel?
http://www.cnn.com/2007/LIVING/worklife/10/04/nasa.everyday/index.html Inventions you probably use.
http://www.space.com/news/horack_visions_991119.html scholarly on communications
http://www.nasa.gov/centers/glenn/research/warp/inspinv.html expanding space travel
Art: Create a pig piñata. Save it for the last week Family Gathering!
http://www.kidspoint.org/columns2.asp?column_id=650&column_type=kpfun
Writing Workshop: Write a realistic short story about space travel. Base your story on research you have done on space travel or the space station. http://www.hispanicheritage.org/about.php

Technology:

More Balanced Literacy: Check out this website:
http://t4.jordan.k12.ut.us/Balanced_Literacy/reading_components.htm
Math Basic Fact Practice: Other Subject Integration
Family Math: http://illuminations.nctm.org/swr/review.asp?SWR=439
Article from PBS on starting a Family Math Night:
http://www.pbs.org/teachersource/whats_new/math/tips0899.shtm
Google Earth – Use Google Earth to find Ricardo's neighborhood in San Antonio:
http://earth.google.com/

Materials
- **BLM** Rectangular Prism-Measurement Lab Record Sheet
- **BLM** Solve It! Problems 1-2
- **BLM** Fraction Action and *X* Marks the Spot
- **BLM** Lessons 1-3 CGI ***Zack Proton and the Wrong Planet***

Math Objectives
- Solve word problems using a variety of strategies and defend their strategies.
- Model and solve 2-step word problems.
- Compose and decompose values to show a new representation of the value.
- Find equivalent fractions.

Language Objectives
- Speak to partners, teacher, and class using vocabulary.
- Discuss problem solving process and strategies.
- Explain how they decided to rename the target number.

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
volume
construction
defective
expensive
impossible

ELPS *(English Language Proficiency Standards)*
2E, 2J, 3E, 3F, 3J, 4F, 4K, 5B, 5G

TEKS for this Unit
7th – 7.2,D; 7.3A;
8th -8.2AB; 8.3B, 8.5A

Unit 2, Lesson 1 — Grades 7-8

Daily Routine

The following daily activities will help prepare your students for the Post-assessment. They are not optional.

ESSENTIAL
Measurement Lab:
- **Lesson 1 – Repeat Unit 1 Lesson 2, using a different set of boxes/rectangular prisms.**
- Lesson 2 – Repeat Unit 1 Lesson 3, using a different set of cylinders.
- Lesson 3 – Percent of Increase in Size

Lesson 1 Materials
- Cardboard boxes (easy to cut apart such as cereal, shirt, etc.)
- Scissors
- Plain paper / pencil
- 1" Grid paper
- Ruler

Lesson 1 Student Groups
1) Cut apart faces of rectangular prism.
2) Find the approximate area of each face of the prism.
3) Label each part with the area, number and unit *(such as 24 in^2)*.
4) Find the approximate surface area of the rectangular prism.
5) Write an explanation of how they found the surface area.

Solve It! Multi-step problem solving
- **Lesson 1 – partners, related problems**
- Lesson 2 – partners, 2-step problem
- Lesson 3 – partners, 2-step problem

Fraction Action
- **Lesson 1 – BLM Fraction Action and X Marks the Spot**
- Lesson 2 – BLM Fraction Action and X Marks the Spot
- Lesson 3 – BLM Fraction Action and X Marks the Spot

***X* Marks the Spot**
- **Lesson 1 – BLM Fraction Action and X Marks the Spot**
- Lesson 2 – BLM Fraction Action and X Marks the Spot
- Lesson 3 – BLM Fraction Action and X Marks the Spot

CGI
- **Lesson 1 – rate, measurement division**
- Lesson 2 – rate, multiplication (assessment item 7)
- Lesson 3 – price, partitive (assessment item 6)

Daily Routine - continued

The following activities, although certainly developmentally appropriate for your 7th and 8th grade students, do not specifically address objectives assessed on the Post-assessment. Schools with shorter teaching spans can consider omitting some or all these activities as your time permits.

OPTIONAL

Target Number

- **Lesson 1 – Target Number 48**
- Lesson 2 – Target Number 20
- Lesson 3 – Target Number 100

Money Matters

(*If you have a full program and wish to use this optional activity, you will find BLMs and Explanations in the Optional Activities Tab of your Teacher's Guide*.)

Technology Option

Practice measuring the surface area of a cylinder online at: http://www.aaamath.com

Assessment Items

Students are introduced to and practice the skills necessary for success on the following assessment items: 1, 2, 3, 9

Unit 2 Lesson 1 – Daily Routines - Measurement Lab

One per student

Rectangular Prism – Measurement Lab Record Sheet

Students should work in small groups.

Materials:

- Cardboard boxes (easy to cut apart such as cereal, shirt, etc.)
- Scissors
- Plain paper / pencil
- 1" Grid paper
- Ruler

Task:

1) Find the approximate area of each of the rectangular prism faces.

2) Label each face with the area (number and unit – for example 24 in^2).

3) Find the surface area of the rectangular prism – that's the total area of all of the faces.

4) Draw rectangles below to represent the faces, labeling each with dimensions and area.

5) Write an explanation of how you found the surface area of the rectangular prism.

Unidad 2 Lección 1 – Rutinas diarias - Laboratorio de medición

Prisma rectangular - Hoja de registro del laboratorio de medición

Los estudiantes deben trabajar en grupos pequeños.

Materiales:

- Cajas de cartón (fáciles de recortar, como cajas de cereales, etc.)
- Tijeras
- Papel y lápiz
- Papel con cuadrícula de 1 pulgada
- Regla

Tarea:

6) Encuentra el área aproximada de cada una de las caras del prisma rectangular.

7) Etiqueta cada cara con su área (número y unidad – por ejemplo, 24 in^2).

8) Encuentra el área de la superficie del prisma rectangular – es decir, el área total de todas sus caras.

9) Dibuja rectángulos debajo para representar las caras, etiquetando cada una con sus dimensiones y su área.

10) Escribe una explicación de cómo encontraste el área de superficie del prisma rectangular.

Unit 2 Lesson 1 – Daily Routines - Solve It! Problems (Pairs)

One per student

Partner #1 - Problem 1:
George and his brother, Justin, rode their bicycles to their summer jobs at the local carwash. George worked 8 hours last week and was paid $9.75 an hour. How much income did he earn last week?

Problem Solution Name:	**Solution Verification** Name:

Partner #2 - Problem 2:
Justin made the same per hour, but was able to work 2.5 times as many hours as George last week. How much income did Justin earn last week?

- What do you need from Problem 1 to solve Problem 2?
- Be sure to verify the answer to Problem 1 before solving Problem 2.
- What is the answer to the question? Show your solution strategy.

Problem Solution Name:	**Solution Verification** Name:

Unit 2 Lesson 1 – Daily Routines - Solve It! Problems (Pairs)

One per student

Compañero # 1 - Problema 1:

George y su hermano, Justin, fueron en bicicleta hasta sus trabajos de verano, el lavadero de autos local. George trabajó 8 horas la semana pasada, y le pagaron $9.75 por hora. ¿Cuánto ganó la semana pasada?

Solución del problema Nombre:	**Verificación de la solución** Nombre:

Compañero # 2 - Problema 2:

Justin ganó lo mismo por hora, pero él pudo trabajar 2.5 veces más que George la semana pasada. ¿Cuánto ganó Justin la semana pasada?

- ¿Qué necesitas del problema 1 para resolver el problema 2?
- Asegúrate de verificar la respuesta del problema 1 antes de resolver el problema 2.
- ¿Cuál es la respuesta a la pregunta? Muestra tu estrategia de solución.

Solución del problema Nombre:	**Verificación de la solución** Nombre:

Unit 2 Lesson 1 – Daily Routines – Fraction Action and *X* Marks the Spot

One per student

Fraction Action

Materials:
None for this activity

Task:

Lisa made $12\frac{3}{4}$ pints of punch. She served $8\frac{2}{3}$ cups. How much punch did she have left over?

X Marks the Spot

Solve for x in these two equations.

$4 + x - 7 = 9$	**$15 - 7 + x = 23$**

Unit 2 Lesson 1 – Daily Routines – Fraction Action and *X* Marks the Spot

One per student

Fraction Action

Materiales:
No

Tarea:

Lisa preparó $12\frac{3}{4}$ pintas (pints) de ponche. Sirvio $8\frac{2}{3}$ tazas. ¿Cuánto le sobró?

X Marca el sitio

Resuelve para x en estas dos ecuaciones.

$4 + x - 7 = 9$	**$15 - 7 + x = 23$**

Unit 2 Lesson 1-3 – Daily Routines - CGI Problems

One per student

CGI – *Zack Proton and the Wrong Planet*

	Multiplication	**Measurement Division**	**Partitive Division**
Grouping/ Partitioning	Omega Chimp ate half of his popcorn before the movie. If he had 2 1/2 cups of popcorn to begin with, how much did he eat before the movie?	Omega Chimp has half-cup portions of popcorn to give away. If he has a total of 4 1/2 cups of popcorn, how many of his friends can share equally in the popcorn?	Omega Chimp wants to share his popcorn among 3 of his friends. If he had 5 1/2 cups of popcorn to share, what portion will each friend receive?
Rate	Effie batted ping pong balls at the rate of 15 balls in 2 minutes. At that rate, how many balls had Effie played in 2 hours?	Effie batted ping pong balls at the rate of 21 balls in 3 minutes. At that rate, how long did it take him to bat 7 balls?	Effie batted a total of 56 ping pong balls in 8 minutes. If he batted at a constant rate, how many balls a minute did he bat?
Price	The tailor for Bounce-back Planet spent $79.85 each on 100 costumes for the pigs. How much did he spend on the costumes?	The total cost for costumes for the Pig Opera was $3915. If each costume cost $135, how many costumes were made?	The total cost for the costumes for the Pig Opera was $2976. If the tailor made costumes for 96 pigs, how much did each costume cost?

Unidad 2, Problemas CGI para *Zack Protón y el Planeta Equivocado* 

	Multiplicación	**División para medir**	**División partitiva**
Agrupar /Separar	El mono Omega se comió la mitad de sus palomitas antes de la película. Si tenía 2 1/2 tazas de palomitas al principio, ¿cuántas palomitas se comió antes de la película?	El mono Omega tiene porciones de media taza de palomitas para regalar. Si tiene un total de 4 1/2 tazas de palomitas, ¿con cuántos de sus amigos puede compartir sus palomitas en cantidades iguales?	El mono Omega quiere compartir sus palomitas con 3 de sus amigos. Si tenía 5 1/2 tazas de palomitas para compartir, ¿qué porción recibirá cada amigo?
Tasa	Effy contestó pelotas de ping-pong a una tasa de 15 pelotas en 2 minutos. A esa tasa, ¿con cuántas pelotas había contestado Effy en 2 horas?	Effy contestó pelotas de ping-pong a una tasa de 21 pelotas en 3 minutos. A esa tasa, ¿cuánto tardó en contestar 7 pelotas?	Effy contestó un total de 56 pelotas de ping-pong en 8 minutos. Si contestó las pelotas a una tasa constante, ¿cuántas pelotas contestó por minuto?
Precio	El sastre del planeta *Bounceback* gastó $79.85 en cada uno de 100 disfraces para los cerdos. ¿Cuándo gastó en los disfraces?	El costo total de los disfraces para la Opera de los Cerdos fue $3,915. Si cada disfraz costó $135, ¿cuántos disfraces se hicieron?	El costo total para los disfraces de la Opera de los Cerdos fue de $2,976. Si el sastre hizo disfraces para 96 cerdos, ¿cuánto costó cada disfraz?

Unit 2 Writing Workshop

- **Genre: Feature Article**

- Writing Objective: Students write a feature article about a science topic based on their research.

- Organization of text:
  - Feature article begins with an introductory paragraph that captures the reader's attention.
  - Feature article has sections with headings that inform the reader about different aspects of the topic
  - Written in a conversational style.

- Possible sequence of mini-lessons:
  1. Brainstorm: In Lesson 1, students compare the science fiction genre (Zack Proton and the Wrong Planet) with a feature article about outer space (from National Geographic for Kids website). Students analyze what language and structure is used to write a feature article.

     To launch this Writing Workshop, tell students that they will be writing their own feature article about outer space – something that could be published in a magazine like National Geographic. They will be researching their topic, and then sharing what they learn in the feature article.

     Outer space is a really big topic, so they will need to choose a smaller topic about outer space. Give students an example: "life on a spaceship." As a class, brainstorm other ideas of what their feature articles could be about. A possible list could include:
     - Life on a spaceship (eating, exercising, working)
     - Spaceship commanders
     - Astronaut's jobs in space
     - Robots
     - Animals in space

     Students decide on a topic, and write it down in their notebook. You can have students brainstorm possible subtopics for their feature article at this time, writing each subtopic at the top of a separate piece of paper. This helps focus students' research to look for information about those specific subtopics. As they do their research, they can write down the information they find about each subtopic on its respective page. Conversely, students can decide what subtopics will be in their feature article (the different headings) as they do research, and record the information by subtopic on separate pieces of paper.

     Provide time for students to research the topic on the internet. If you don't have access to enough computers, you may decide to print out ahead of time information from the internet and provide it for students to read. This will limit the topic they research, however, since you will be providing the reading materials.

     Circulate while students are researching to help them record information by subtopic. You can also help students paraphrase so they don't copy chunks of text. One way to do this is to have students read the sentence(s) with the key information. Then, cover the text (or turn away from the computer screen) and explain what they learned in their own words. This is what they should write down. They can refer back to the text to refer to key words or data.

2. Draft: Model for students how to take their research and turn it into a feature article. First, model how you think of a catchy way to start the feature article. Often, they begin with a question posed to the reader. Then, show how you write a section for each subtopic, with a heading.

   Provide time for students to write independently to draft their feature articles. Circulate to help students think of an interesting way to begin their feature articles, and to help them organize the writing into sections with headings. Continue to help students paraphrase information if you see that they have copied chunks of text from a source. This is a critical skill for middle school students to develop.

3. Revise: Based on the difficulties you observed students having during the drafting stage, model any of the following to help students improve their writing:

   - beginning a feature article in an interesting way (such as with a question)
   - paraphrasing
   - organizing the feature article with subtopics (each with its own heading)
   - elaborating the subtopics
   - explaining the information in a conversational tone

4. Publish: If time permits, have students publish their feature articles on the last day. Students can share their feature articles with a partner, or with another class. You may want to consider mailing copies of the feature articles to a periodical such as National Geographic for Kids, to show students what authors do to try to get their writing published.

Materials
- Chart paper to make a list of science words
- Text excerpt for Read & Retell activity written on chart paper, or projected on a SmartBoard.

Literature Selection
Zack Proton and the Wrong Planet
by Brian Anderson

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
volume
construction
defective
expensive
impossible

 **Advertisement**
Students could write an advertisement for their "defective item," using words and ideas from their record sheets.

ELPS *(English Language Proficiency Standards)*
2C, 2J, 3B, 3J, 4F, 5B, 5G

Unit 2, Lesson 1 — Grades 7-8

Classroom Lesson

Every day teachers must post the objectives on the board, read them to the students, and have students read them together with the teacher. At the end of the lesson, teacher and students should review to see if they have accomplished both math and language objectives.

Math Objectives:
- Discuss and share length and width measurements of rectangles.
- Discuss and share area calculations using measurements.
- Discuss and share area calculations using arrays.
- Create a construction (model) using defective items.

Reading Objectives
- Understand what science fiction is.
- Understand what a feature article is.

Language Objectives:
- Recreate a science fiction excerpt using science vocabulary.
- Compare and contrast two genres related to science.

BEFORE READING
Building Background – Literature & Vocabulary
- Show students the cover of ***Zack Proton and the Wrong Planet*** and read aloud the title. Explain that this unit's book is a chapter book, which they will be reading over the three days of the unit.
- Do they think this book is fiction or nonfiction? Why?
- Read the back cover paragraphs, which give a summary of the plot. Tell students that this is a special type of fiction called "science fiction." They may have heard it called "sci fi."

Read & Retell activity
This activity helps students examine the features of the science fiction genre, including the language that is typically used. Students are given the fun challenge of trying to recreate a text excerpt from ***Zack Proton and the Wrong Planet*** after reading it with the teacher and talking about what makes it science fiction. Comparing what they remember with the original helps draw students' attention again to the features of science fiction.

Alliteration Log
Teach a brief lesson on alliteration. You could adapt http://faculty.rcoe.appstate.edu/smithtw/RE_3150_web/Craft_Minilessons/RE_3150_f03/Amy_Steelman_Alliterations.htm for the lesson.

Begin an Alliteration Log today so that as students hear an alliteration during the reading, they write it in the log.

Timeline
Begin a timeline of the events in the story. Each time the story is read during the unit, see if students find more events to add to the timeline.

Technology Option
Author Brian Anderson will be reading one of the chapters of the book, possibly chapter 2. You might want to use his rendition during this time.

Unit 2, Lesson 1 — Grades 7-8

Classroom Lesson - continued

1. Tell students that you are going to show them part of Chapter 1, and they will try to see what makes this book science fiction.

2. Before showing students the excerpt from Chapter 1, ask, "What scientific words do you think might be in the first part of this book?"

3. Have students briefly brainstorm with a partner, and then share with the class. Quickly jot down the words in a list on a piece of chart paper, on the board, or on a SmartBoard.

4. Display the text excerpt to students so they can see it *(projected on a screen, written on chart paper)*. Tell students that they need to pay close attention to what you read, because you will then **cover up this part of Chapter 1, and they will try to rewrite this science fiction text using as many words as they can remember**.

5. Read aloud the text, while students follow along:

Text Excerpt: Chapter 1

The news continued. "Planet Bounceback is now the proud owner of sixteen million pigs, delivered today from planet Pigfarm, more than half a universe away.

"Leapin' leptons!" Zack cried. "The *Risky Rascal* was carrying sixteen million pigs! We've got to get to planet Bounceback right away!"

Omega Chimp pulled a map out from his dashboard console. "According to this star chart, Bounceback is only two stars away in the Gamma Triton system. We should be there in less than an hour."

6. When you finish reading the text excerpt aloud, ask, "Did you see any of the scientific words you predicted?"

7. Then, ask students: "What do you think makes this book science fiction?" Guide students to see that:

Guided Reading Groups and Independent Reading Connection
If you conduct guided reading groups as part of your balanced literacy instruction, or provide time for independent reading, you can reinforce these same reading strategies.

After students have read the text on their own, to improve their comprehension of the more difficult parts:

- Genre
  - What genre is this text that you're reading?
  - How do you know it's that genre?
  - What is the purpose of this genre?
  - How is this genre structured?
- Determining Word Meaning
  "What does _____ mean?" (Reread the sentence. Does it give us any clues? Read the next sentence(s) or previous sentence(s). Do they give us any clues?)

Listening Center: Independent Reading
Let students listen to ***Zack Proton and the Wrong Planet*** in a Listening Center as part of their independent reading time.
Beginning ELLs: Benefit from listening to part of the text repeatedly to connect oral and written language. Since this is a long text, have them point to their favorite part and listen to that section several times.

  - The text is about a science topic – outer space - but it's not an informational text about outer space.
  - It is a fictional story that takes place in the future, imagining how science and technology will have changed.
  - In this science fiction book, space travel is much faster, animals can live in outer space, and spaceships are much larger *(they can carry sixteen million pigs!)*. All of these things make it science fiction.

8. You can create a genre chart that summarizes these features of science fiction, either during this activity, or while reading aloud the chapter book. See example of genre chart. Leave space for a column to the right, so you can later compare the genre of science fiction with the genre of science feature articles.

Genre chart example:

	Science Fiction	
Purpose	To entertain; to imagine life in the future with changes in science and technology	
Structure	Make-believe story about something scientific: life in the future, outer space, aliens, time travel, robots/technology. Based on how science or technology could change in the future, and how it could affect people. Follows fiction structure: an orientation, problem, events, and a resolution.	
Language	Science vocabulary Descriptive verbs, adverbs, adjectives to show the action	

Intermediate & Advanced ELLs: Benefit from listening to a text repeatedly to develop fluency, and reading along softly when possible. Have students choose their favorite page, and record themselves reading it aloud using a podcast. Then, they listen to that particular page several times, reading along softly. When they feel they've had enough time to practice, they record themselves reading that page again. Have students compare their two recordings to see how their fluency has improved.	**Unit 2, Lesson 1** **Grades 7-8** **Classroom Lesson** - continued  9. Read aloud the text excerpt one more time, reminding students beforehand that they should pay close attention to the language the author used, because afterwards you will cover it up and they will try to recreate it. 10. Cover the text excerpt, and have students work for a couple of minutes with a partner to rewrite as much of the text as they remember. 11. Regroup the class, and display the text excerpt again. How does it compare to what they wrote? What language did they remember? What aspects of science fiction did they remember? (the fictional, futuristic characters, the outer space setting, words like *planet, universe, stars, system, sixteen million*, etc.) ***Note:*** The expectation of Read & Retell is NOT that students will be able to create an identical reproduction of the text excerpt. Instead, the goal is to draw students' attention to the type of language used in science fiction, and the features that are typical of this genre. **DURING READING** **Comprehensible Input – Literature & Vocabulary** You will read chapters 1 – 5 today, skipping the "comic" dream inserts which lose something in oral interpretation. If you are doing the timeline or story map activity, place the first one or two major events from the plot. During the read aloud, the goal is to support students' comprehension of the text by modeling and practicing reading strategies: • **Craft and Structure: Genre** • **Determining Word Meaning** This section indicates places in the text where you can: • Briefly pause to model a reading strategy by thinking aloud. • Briefly pause to have students practice a reading strategy by answering a question you pose. Keep in mind that pausing the reading for too long at any of these places will make the reading very disconnected. This interferes with students' comprehension and enjoyment of the text, so keep the reading as fast-paced as possible. You may want to mark the following stopping points in the text with sticky notes, indicating what you will say to students.

Classroom Lesson - continued

Throughout the Reading:
Word play
There are many places where the author uses word play. It is very difficult for ELLs to understand the humor behind word play, and can also be challenging for English-proficient students depending on their background knowledge. You will need to determine which word plays are worth explaining to the class. Some can be easily explained, and students can quickly understand the humor *(such as "New Pork City" instead of "New York City")*. Others make reference to things that may be far outside students' personal experiences, such as some literary references *("UV or not UV" instead of "To be or not to be.")*. Decide whether it is worth taking instructional time to fully explain some of these references.

p. 10 Determining Word Meaning

- Teacher Question: What does the word *volume* mean in this sentence?
  It says Omega Chimp was trying to "drown out" the ping pong sound. What does that tell you about the volume? (*He turned the volume up a lot.)*

- Teacher Think Aloud: So it says here that *construction* ended on the wormhole, and now there aren't any more traffic jams. *Construction* must mean when you build or repair something – like when we see people repairing the street - and it makes it hard for us to get around that area. It's funny to think about construction and traffic jams in outer space!

Add the word cards for *volume* and *construction* to the word wall.

p. 13 Craft and Structure: Genre

- Teacher Think Aloud: Just in this first chapter there are so many things that show us this is science fiction – things the author imagines could happen in the future:
  - There's a talking chimp who runs the cockpit of the spaceship.
  - There's a robot who interacts with Zack, the commander of the spaceship.
  - There is a news broadcast in outer space talking about everything that happens there.

You can add some of these specific examples to the Science Fiction genre chart.

Unit 2, Lesson 1 Grades 7-8

Classroom Lesson - continued

p. 16 Determining Word Meaning

- ***Note: Make sure you read this page, since there are two vocabulary words here.**
- Teacher: Let me write this last sentence about FE-203 on the board so you can see it: "This FE-203 personal droid is so defective that it would require expensive upgrades before it can be sold for scrap."
- Teacher Question: From the clues in this sentence and on this page, what do you think the words *defective* and *expensive* mean? *(Highlight or underline those words in the sentence.)* Talk with your partner.

Regroup the class and have several students share. Once you have helped them explain each word's meaning using clues from that page, add the two word cards to the word wall.

p. 18 Determining Word Meaning

- Teacher Question: What does the word *impossible* mean? Hold up the word card for students to see. Call on a student to share, and point out the root word: possible. Explain that the prefix im- means "not," so the word means "not possible."

p. 20 Craft and Structure: Genre

- Teacher Question: What happened in Chapter 2 that shows you it is science fiction? Talk with your partner.

Regroup the class and have several students share. Some responses could be:

- Their space travel is incredibly fast! They got to the planet in less than an hour.
- They can beam themselves down to a planet – impossible with our current science and technology.
- Planet Bounceback disappeared.
- Their computers give them updated maps of the universe.

You can add some of these specific examples to the Science Fiction genre chart.

p. 30 Craft and Structure: Genre

- Teacher Question: So, what happened in Chapter 3 that shows you it is science fiction? Talk with your partner.

Classroom Lesson - continued

Regroup the class and have several students share. Some responses could be:

- Sixteen million pigs are living on the planet.
- There is an alien tailor who is creating costumes for the pigs.
- Spaceships can travel very long distances – 10 galaxies, for example.

You can add some of these specific examples to the Science Fiction genre chart.

p. 30 Craft and Structure: Genre

- Teacher Question: What else has happened that shows you it is science fiction? Talk with your partner.

Regroup the class and have several students share. Some responses could be:

- Effie the robot created a futuristic machine.
- Effie the robot has real conversations with Zack and Omega Chimp.

You can add some of these specific examples to the Science Fiction genre chart.

Transition to Math

Students are to share their results from the measurement lab. They will use their knowledge of area, array models and formula during the TV Lesson and Follow-up Lessons. Make sure they understand these simple concepts.

Give students the handouts for the Math Lesson – piggy spaces sheet, inch ruler, tape and scissors. Students are to cut out the pigs, keeping the border around each, before the Math Lesson.

Objectives

Review both language and math objectives, making sure students understand how they accomplished each.

Duplicate on cardstock and cut apart for word cards.

volume

construction

expensive

impossible

Duplicate on cardstock and cut apart for word cards.

defective
defectuoso

Lesson 1 – Class Lesson – Vocabulary

Duplicate on Cardstock and cut apart for word cards.

volumen

construcción

caro

imposible

Materials
- Math Lesson vocabulary cards
- **BLM** Piggy Spaces cut-outs with border
- **BLM** Piggy Spaces-Practice Problems
- customary ruler
- tape (to tape down pigs)
- scissors

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
volume
construction
defective
expensive
impossible

ELPS *(English Language Proficiency Standards)*
2C, 2E, 2F, 2J, 3E, 3J, 4F

Unit 2, Lesson 1 — Grades 7-8

Math Lesson

Math Objectives:
- Use grid paper to measure length and width of rectangles.
- Calculate area of rectangles.
- Compare areas (equivalent ratios) using visual representations, patterns, and cross multiplication.

Language Objectives:
- Discuss strategies to determine areas and equivalent ratios.
- Explain personal strategies used to find equivalent ratios.

Building Background
The Vietnamese (Pot-bellied) Pigs are a dwarf swine breed which was developed in the 1960s. They were originally brought into Sweden and Canada and have since moved into a number of countries. Full grown potbellied pigs weigh an average of 70–150 lbs. with some reaching 200 lbs. or more; they average 3 ft. long and 15" tall. Full growth is not reached until about 5 years of age.
http://www.hackneycityfarm.co.uk/docs/animals/pigs.htm

Comprehensible Input
How many pigs were dropped off on Bounceback Planet? *(16 million)* How much room would that many pigs need? Could a planet hold that many pigs? How much area would they cover? You are going to answer these questions over the next two days by starting with a simpler problem.

Show the students the pig cut out in the rectangle *(one pig only, but leave the border around it so they are working with a rectangle that has a picture of a pig).*

Obviously, this is a two-dimensional representation of a pig. What measurements can we take on this pig? *(length and height)* What measurements can't we take? *(width and weight)* That's OK, we'll see how much area this pig would cover if it were lying down flat on the ground. *(Measure the picture – it should be one-inch tall and two-inches long.)*

You measured area this morning during your measurement lab. How much area does one of these pigs take up? *(two square inches)*

How much area would two of these pigs cover? *(Pause, then take two pigs and lay them end to end, measure to see that it is one-inch tall and four-inches long.)* It is four square inches. What if I arrange them in a different array, one above the other? *(Do so, measure to see that this measures two-inches by two-inches and is still four square inches.)*

How much area would four of these pigs cover? *(Pause, then take two more pig pictures.)*

First, lay the pigs end to end. How much area would they take up this way? *(one-inch tall and eight-inches long, or eight square inches)* Would it make a difference if I arranged the pigs in an array, two rows and two columns of pigs? Talk about it. *(Pause, then arrange them in a two pig x two pig array. Measure the array to see that it is two-inches tall and four-inches long, or eight square inches – you may need to tape down the pictures so they don't move on you).*

Now using these pictures and the measuring tool is fine; but how could I use ratio to help me find larger quantities? We know that it doesn't matter how we arrange the pigs, they're going to cover the same amount of area.

One pig covers two square inches. I can represent that with the ratio one pig per two area units or **1:2** or as a fraction $\frac{1}{2}$.

Suppose I want to find out how much area 24 pigs would cover? Let's use *x* to represent the unknown area.

24 pigs would cover *x* square units. I can represent that with the ratio **24 : x** or as a fraction $\frac{24}{x}$.

During the last unit we found EQUIVALENT RATIOS. Remind one another of how we did that. $\frac{1}{2} \quad \frac{24}{x}$

One way to do that is to find a common denominator. We have both numerators, so let's start there.

I know that I have to multiply the one by some number to get the new numerator of 24. That's easy. I have to multiply by 24.

Well, if I multiply the numerator by 24, I must multiply the denominator by 24 as well so that I am multiplying by a form of ONE and keeping the values equivalent.

$$\mathbf{\frac{24}{24} \times \frac{1}{2} = \frac{24}{48}}$$

What does the 24 represent in this ratio? *(the number of pigs)*

What does the 48 represent in this ratio? *(The square inches that 24 of the pigs cover.)*

Another way that we found to find EQUIVALENT RATIOS is to cross multiply. This really is just another way of finding common denominators.

$$\frac{1}{2} \times \frac{24}{x}$$

$x = 48$. Well that was easy!

OK, so what if we wanted to find out how many pigs it would take to cover a certain area? How many pigs would it take to cover an area of 12 square inches?

Again, we know that our pig pictures take one pig to cover two square inches, or a ratio of 1 to 2 or 1:2 or ½. But this time, we know the area to cover, so instead of *x* we'll put our known as the denominator of the second ratio. What we don't know is how many pigs it will take to cover that much area. So one pig per two square inches is equal to *x* pigs per 12 square inches.

$$\frac{1}{2} \times \frac{x}{24}$$

We could find a common denominator, or we could use the short cut and just cross multiply 12 x 1 = 12; 2 x x = 2x

$2x = 12$ *(now I have to divide both sides by 2)*
$x = 6$
An extra step, but still really easy, yes!!

Repeat the process for as many of the following as possible:

16 square units
20 square units
250 square units
275 square units *(be sure to do this one)*

	Unit 2, Lesson 1 **Grades 7-8** **Math Lesson** - continued  --- Every time you should have students identify what each number represents – kids get lost in ratios because they forget that each number represents something real; and that each ratio much compare in the same way. Be sure that you have time to finish 275 square units, even if you have to omit some of the others. This one will not come out even, so kids will have to decide what to do with the "half of a pig." So how many pigs would it take to cover 275 square units? 137 – There will be room to spare, but we have to drop the half of the pig. Now, switch and find out how many square inches 275 pigs would cover. 550 square inches – no leftovers here! Students will be working their way up to larger numbers of pigs in the classroom follow-up lesson. In Lesson 2 they will compare to the measurements of the Vietnamese Pig, or Pot-bellied Pig. **MAS Space** You were asked to explain how the formula for finding area *(lw*) relates to the area model on grid paper. Please compose a class explanation and write our pirate so he will understand the concept and how the formula works. **Objectives:** Read through the math and language objectives, making sure that students understand how they accomplished each.

Unit 2 – Math Lesson – Vocabulary

Duplicate on cardstock and cut apart for word cards.

ratio
equivalent
rate
unit rate

Duplicate on cardstock and cut apart for word cards.

razón

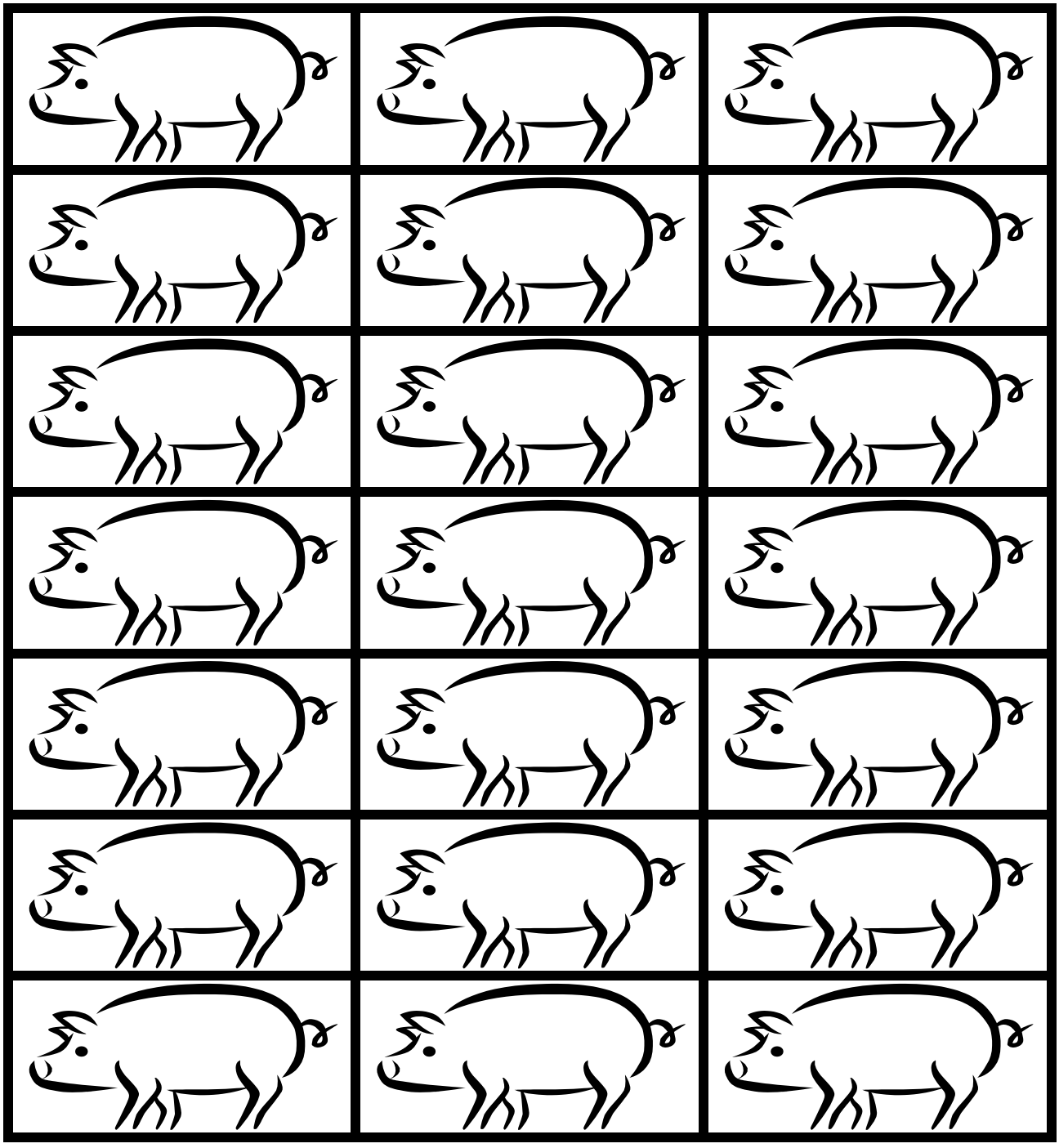
equivalente

tasa

tasa de unidad

Unit 2 Lesson 1 – Math Lesson
One per student

Piggy Spaces



Unit 2 Lesson 1 – Math Lesson

Piggy Spaces – Practice Problems

How much area does one pig cover? _____

How do you know?

How much area would two pigs cover? _____

Does it matter how you arrange the pigs? Explain.

How much area would four pigs cover? _____

Does it matter how you arrange the pigs? Explain.

How much area would 16 pigs cover? Do not measure 16 pigs. Use ratio to determine the area.

How many pigs would it take to cover 20 square inches? Use ratio to determine the answer.

How many pigs would it take to cover 250 square inches? Use ratio to determine the answer.

How many pigs would it take to cover 275 square inches? Use ratio to determine the answer.

Unidad 2 – *Zack Protón y el Planeta Equivocado*
Lección 1 – Lección por TV
Hoja de espacio que ocupan los cerditos

¿Qué área cubre un cerdo? _____

¿Cómo lo sabes?

¿Qué área cubrirían dos cerdos? _____

¿Es importante la forma en que acomodes los cerdos? Explica.

¿Qué área cubrirían cuatro cerdos? _____

¿Es importante la forma en que acomodes los cerdos? Explica.

¿Qué área cubrirían 24 cerdos? No midas 24 cerdos. Usa una razón para determinar el área.

¿Cuántos cerdos se necesitarían para cubrir 12 pulgadas cuadradas? Usa una razón para determinar la respuesta.

¿Cuántos cerdos se necesitarían para cubrir 275 pulgadas cuadradas? Usa una razón para determinar la respuesta.

Usa el reverso de esta hoja para resolver el resto de los problemas con el maestro(a) por TV.

Materials
- **BLM** Piggy Spaces Record Sheet
- **BLM** Domino Blast Off Directions
- **BLM** Domino Blast Off Game Board
- **BLM** Multiplication Chart-Equivalent Ratios
- dominoes (1 set for 4 students)
- dice (1 per 4 students)
- game markers
- **BLM** Recursive Review Problems Lessons 1-3

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
volume
construction
defective
expensive
impossible

ELPS *(English Language Proficiency Standards)*
2D, 2G, 2J, 3B, 3E, 3H, 4K, 5B, 5G

Unit 2, Lesson 1 — Grades 7-8

Follow-up

Math Objectives:
- Choose a strategy to compare areas.
- Use equivalent ratios to solve problems.

Language Objectives:
- Discuss strategies used to determine areas and equivalent ratios with peers.
- Explain the strategy used to find equivalent ratios.
- Write about your knowledge of equivalent ratios.

Practice and Application
The Classroom Teacher should repeat the same process with the students using the TV Teacher format. Use the Teacher's Guided Example for your script if you'd like. Students should have a copy of the Racing Ratio Example and the Racing Ratio Problems. Walk through the example with the students, then let them work comfortably in pairs or small groups to solve the other four problems.

Recursive Review
*We're going to use this time to reflect on a skill we've learned in a previous lesson, to keep that skill current with more practice. Today, let's concentrate on unit rate. You may solve this any way you wish. *Hint: you can set up equivalent ratios as a strategy.*

- Alejandro bought 5 oranges for $1.25. What did each orange cost?

Writing Topics
Independent Writing Topic
Students will have a daily writing activity which will incorporate the day's focus math vocabulary.

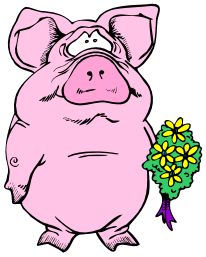
- **What do I know about equivalent ratios?**

End today by teaching Domino Ratio Blast Off Game which you can use in a center or as a filler activity as needed. This is an excellent practice for skills already learned.

Objectives
Review the math and language objectives to make sure that they were accomplished and that the students realize how they were accomplished.

Unit 2 Lesson 1 – Follow-up

Piggy Spaces – Record Sheet



Use two strategies for finding EQUIVALENT RATIOS for the following problems. Notice that the ratios are different from those we worked with during the Math Lesson.

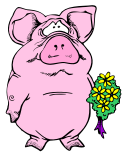
If 3 pigs cover 8 square inches, how many square inches would 57 pigs cover? Be sure to label your ratios so we know what each number represents.

If 9 pigs cover 27 square inches, how many pigs would it take to cover 81 square inches?

If 5 pigs cover 12 square inches, how many pigs would cover 81 square inches?

Unidad 2 – *Zack Protón y el Planeta Equivocado*

Lección 1 – Lección de seguimiento **Hoja de registro de espacio que ocupan los cerditos**



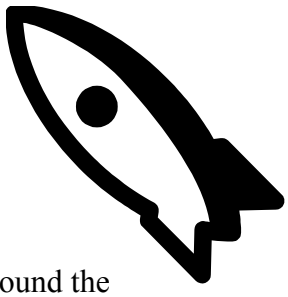
Usa 2 estrategias para encontrar RAZONES EQUIVALENTES para los siguientes problemas. Nota que las razones son diferentes a las que usamos durante la lección por TV.

Si 3 cerdos cubren 8 pulgadas cuadradas, ¿cuántas pulgadas cuadradas cubrirían 57 cerdos? Asegúrate de rotular tus razones para que sepamos qué representa cada número.

Si 9 cerdos cubren 27 pulgadas cuadradas, ¿cuántos cerdos se necesitarían para cubrir 81 pulgadas cuadradas?

Si 5 cerdos cubren 12 pulgadas cuadradas, ¿cuántos cerdos cubrirían 81 pulgadas cuadradas?

Unit 2 Lesson 1 – Follow-up



Domino Ratio Blast-Off Directions

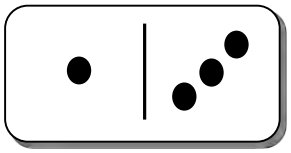
Materials:

- 1 set of double 6 dominoes
- 1 six-sided die
- Game board
- Game markers (beans, sticks, stones, buttons, bottle caps -- anything around the house to keep players spot on the board)
- Suggested EQUIVALENT RATIO sheet

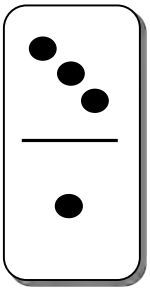
Procedure:

- Place all of the dominoes face down in one layer on the floor or table so that everyone has access to them.
- Place the game board on the floor or table so that everyone has access to it.
- Each player puts his or her game piece in a different corner, or space station on the board.
- The object of the game is to be the first player to make an orbit around the game board and dock back at his or her own space station.

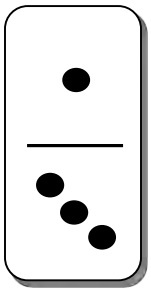
1. Play begins with Player number 1 drawing a domino from the pile. Player places the domino in a fraction format and announces what the ratio is. For example:



This domino could be used in either of the two ways below.



Ratio 3 to 1.



Ratio 1 to 3.

2. Player then gives an equivalent ratio for the one drawn. If the equivalent ratio is correct, Player rolls one die and moves that many spaces around the board. If the ratio is incorrect, Player does not move.

3. Play continues with the next person.

4. Winner is the first player to orbit the board and enter his or her space station.

Unidad 2 – ***El protón de Zack y el planeta equivocado***

Lección 1 – DIVERSIÓN FAMILIAR – Instrucciones de despegue, promedio de dominós

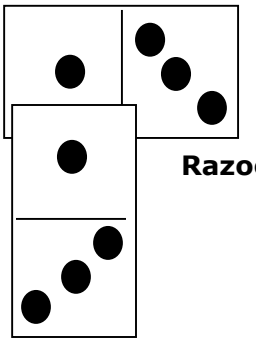
Materiales:

- **1 juego de 6 dominós dobles**
- **1 dado de seis lados**
- **Tablero de juego**
- **Marcadores de juego (semillas, palitos, piedras, tapas de botella, cualquier cosa que tenga en su casa y que sirva para marcar el lugar de los jugadores en el tablero)**
- **Hoja sugerida de PROMEDIO EQUIVALENTE**

Procedimiento:

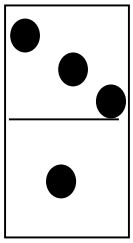
- **Coloque todos los dominós boca abajo en una capa sobre el piso o la mesa para que todos tengan acceso a los mismos.**
- **Coloque el juego sobre el piso o la mesa para que todos tengan acceso al mismo.**
- **Cada jugador coloca su pieza en una esquina diferente o estación espacial en el tablero.**
- **El objeto del juego es ser el primer jugador en completar una órbita alrededor del juego y regresar a su propia estación espacial.**

El juego comienza con el Jugador número 1, quien toma un dominó de la pila. El jugador coloca el dominó en un formato de fracción y anuncia el promedio a usar. Por ejemplo,



Razoó de 1 a 3.

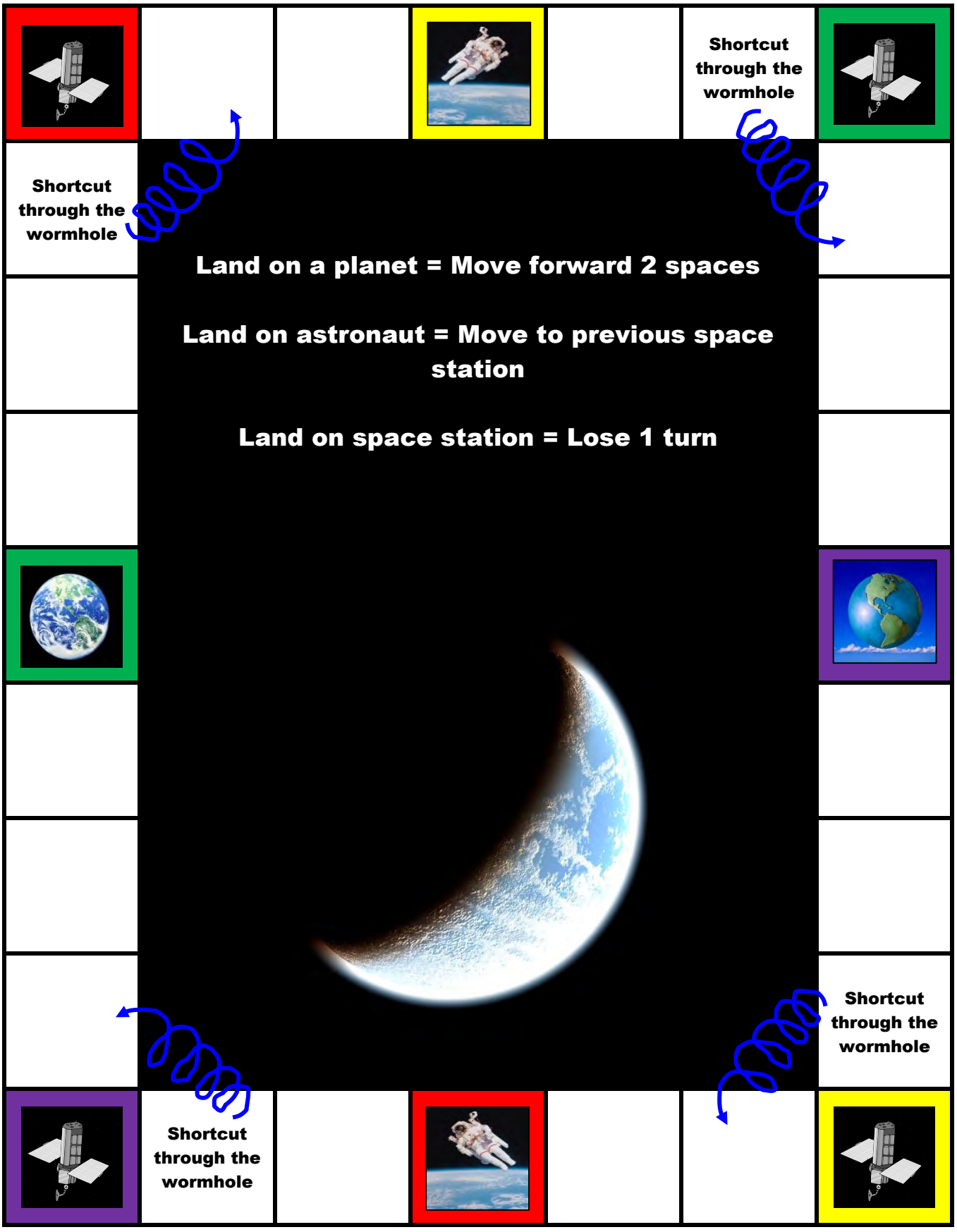
se podría usar en cualquiera de las dos maneras a continuación.



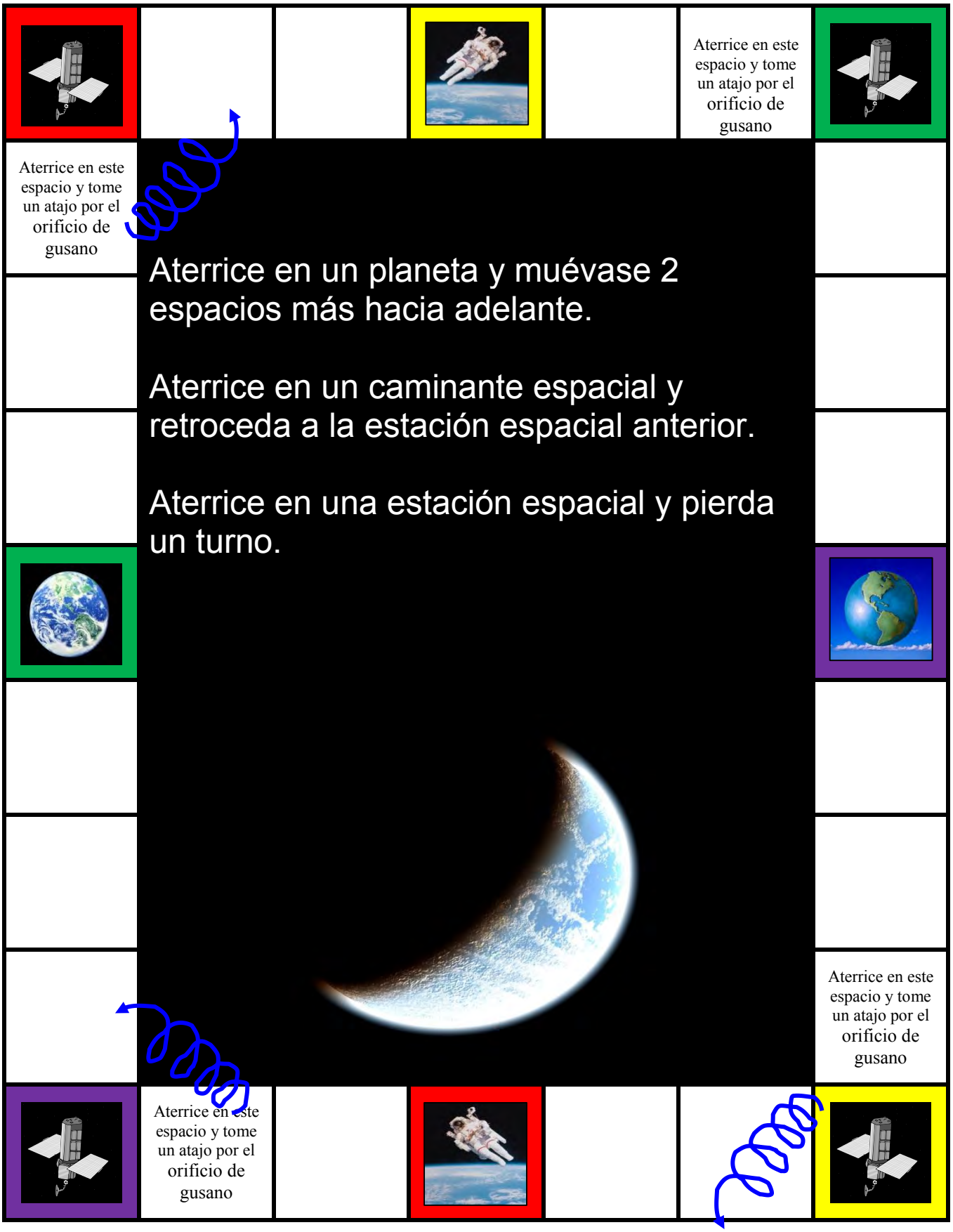
Razón de 3 a 1.

El jugador de inmediato da un promedio equivalente para el dominó seleccionado. Si el promedio equivalente es correcto, el Jugador hace rodar 1 dado y se mueve alrededor del juego tantos espacios como los obtenidos. Si el promedio es incorrecto, el Jugador no se mueve.
El juego continúa con la siguiente persona.
El ganador es el primer jugador que completa una órbita alrededor del juego e ingresa a su estación espacial.

Domino Ratio Blast-Game Board



Domino Ratio Blast-Game Board



Unit 2 Lesson 1 – Follow-up

Domino Blast-Off Multiplication Chart – Equivalent Ratios

X	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Equivalent ratios for $\frac{1}{2}$, $\frac{3}{4}$, $\frac{5}{6}$, and $\frac{8}{12}$ are already highlighted for you. These are just a few of the many equivalent ratios found on a multiplication chart. Their multiplier, or scale factor, is found in the same way you use this chart for multiplying. (Top row)

Example: $\frac{8}{12}$ multiplied by 3 will result in the equivalent ratio: $\frac{24}{36}$ noted by the arrow.

This handout may be used to assist you in finding equivalent ratios for the Domino Blast-Off game.

Unit 2 Lessons 1-3 – Follow-up

Recursive Review Problems

Solve the recursive review problems using any strategy of your choice.

Unit 2 Lesson 1
Alejandro bought 5 oranges for $1.25. What did each orange cost?

Unit 2 Lesson 2
The average dandelion grows 6 inches tall and has a flower diameter of 2 inches. If a gigantic dandelion grew to 2 feet tall and was in proportion to the average, which ratio could be used to find the expected diameter of the flower?

A. $\frac{6}{2} = \frac{2}{x}$

B. $\frac{6}{2} = \frac{x}{2}$

C. $\frac{6}{2} = \frac{24}{x}$

D. $\frac{6}{2} = \frac{x}{24}$

Unit 2 Lesson 3
Emilio caught three fish. Each fish was in proportion to the others. The second fish he caught measured 16-inches long and weighed 6 pounds. The first fish he caught weighed 3 pounds. The last fish he caught was 10-inches longer than the second fish he caught. What was the weight and length of each fish?

Unit 2 Lessons 1-3 – Follow-up

Recursive Review Problems

Solve the recursive review problems using any strategy of your choice.

Unit 2 Lesson 1

Alejandro compró 5 naranjas por $1.25. ¿Cuánto costó cada naranja?

Puedes resolver esto de la forma que quieras.

Unit 2 Lesson 2

El diente de león promedio crece 6 pulgadas de altura y su flor tiene una diámetro de 2 pulgadas. Si un diente de león gigante creció a 2 pies de alto y tenía las mismas proporciones que el diente de león promedio, ¿qué razón podría usarse para encontrar el diámetro esperado de la flor? (Pista: rotula cada parte de las siguientes razones para ver cuál ecuación representa la relación del problema.)

A. $\frac{6}{2} = \frac{2}{x}$

B. $\frac{6}{2} = \frac{x}{2}$

C. $\frac{6}{2} = \frac{24}{x}$

D. $\frac{6}{2} = \frac{x}{24}$

Unit 2 Lesson 3

Emilio pescó tres peces. Los tres peces tenían proporciones iguales. El segundo pez que pescó medía 16 pulgadas de longitud y pesaba 6 libras. El primer pez que pescó pesaba 3 libras. El último pez que pescó medía 10 pulgadas más que el segundo pez. ¿Cuál era el peso y longitud de cada pez?

Materials
- 1 cup guacamole or other dip
- 6 carrots (small)
- 2 half-cup measuring cups
- 2 plastic spoons
- 2 paper dessert plates
- 2 paper towels

All items listed above per partner pair
- **BLM** Dip 'n Veggies-Snack Fractions

Math Objectives
- Use addition, subtraction, multiplication and division to solve problems involving fractions and decimals.
- Convert between fractions, decimals, whole numbers and percents.
- Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios).
- Estimate and find solutions to application problems involving percent.

Language Objectives
- Discuss fraction comparisons.
- Discuss fraction equivalencies.
- Adding and subtracting like-denominators.

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
volume
construction
defective
expensive
impossible

Unit 2, Lesson 1 — Grades 7-8

Snack Fractions

Students should wash their hands before this activity if using food items.

Snack Fractions
Students should have the skills to answer these in small groups. Have the students work through the BLM before sharing the actual snack.

Circulate the room while students are working on the BLM, asking questions as needed to guide, redirect, extend:

QUESTIONS:
- How will you find the total yield of these ingredients?
- Explain how to find your fourth.
- How can proportion help you to increase the recipe to serve 10?
- Explain how you could mentally increase the recipe ingredients to serve 25 people once you know how much each would be for 10 people.

Finally, let them share the guacamole *(or other dip)* with a partner.

(*Naturally, if you think the portions suggested in the materials list are too small for a middle schooler's snack, feel free to increase the amounts; make sure, though, that you make the amounts easily divided in halves – they've already done a great deal of work to get the snack.)*

Snack Fraction Journal Writing: BLM Dip and Veggies Fractions
Explain how you determined the amount of ingredients needed for 10 people.

Objectives: Review the objectives with the class, making sure they understand how they achieved each.

Unit 1 Lesson 1 – Snack Fraction

One per student

Dip 'n Veggies – Snack Fractions

Recipe for Perfect Guacamole

- 2 ripe avocados (about 2.25 cups)
- 1/2 red onion, minced (about 1/2 cup)
- 1-2 Serrano chiles, stems and seeds removed, minced
- 2 tablespoons cilantro (leaves and tender stems), finely chopped
- 1 tablespoon of fresh lime or lemon juice
- 1/2 teaspoon coarse salt
- A dash of freshly grated black pepper
- 1/2 ripe tomato, seeds and pulp removed, chopped (about 1/4 cup)

Assuming that the lime juice, cilantro, salt, pepper and Serrano chiles together will add about 1/8 cup to the dip, about how much guacamole will these ingredients yield?

If four of you are sharing the guacamole, what volume will you receive for your portion?

What is the ratio of avocados to ripe tomatoes?

Three of these avocados cost $5.36. What would one avocado cost?

This recipe is recommended for not more than four people. What would the measures of each ingredient be if you wished to serve 10 people?

Unidad 1 Lección 1 – Fracciones de refrigerios

Una por estudiante

Receta para el guacamole perfecto

- 2 aguacates maduros (aproximadamente 2.25 tazas)
- 1/2 cebolla roja, picada (aproximadamente 1/2 taza)
- 1-2 chiles serranos, sin tallo ni semillas, picado
- 2 cucharadas de cilantro (hojas y tallos tiernos), picado finamente
- 1 cucharada de lima fresca o jugo de limón
- 1/2 cucharada de sal gruesa
- Una pizca de pimienta negra recién molida
- 1/2 tomate maduro, sin semillas ni pulpa, picado

Asumiendo que el jugo de lima, el cilantro, la sal, la pimienta y los chiles serranos en conjunto agregarán cerca de 1/8 taza a la salsa, ¿aproximadamente cuánto guacamole se producirá con estos ingredientes?

Si comparten el guacamole entre cuatro, ¿qué volumen recibirás para tu porción?

¿Cuál es la relación de aguacates a tomates maduros?

Tres de estos aguacates cuestan $5.36. ¿Cuánto costará un aguacate?

Esta receta no es recomendada para más de cuatro personas. ¿Cuáles serían las medidas de cada ingrediente si quisieras hacer esta receta para 10 personas?

Unit 2 Lesson 1 – Family Fun

Dear _____,

We started reading ***Zack Proton and the Wrong Planet*** today.

Our math lesson used these ideas from the story…

_____

_____

_____

_____

_____

_____

My teacher would like for us to:

Sincerely,

_____

Unit 2 Lesson 1 – Family Fun

Dear _____,

Empezamos a leer *Zack Proton y el planeta equivodado* hoy.

Utilizamos estas ideas del libro en nuestra lección de matemáticas hoy…

_____
_____
_____
_____
_____
_____

Mi maestro/a quiere que nosotros:

Atentamente,

_____

Materials
- **BLM** Cylinders-Measurement Lab Record Sheet
- **BLM** Solve It! Problems 3
- **BLM** Fraction Action and *X* Marks the Spot
- Fraction Math Balance
- **BLM** Lessons 1-3 CGI ***Zack Proton and the Wrong Planet*** (listed in Lesson 1)

Math Objectives
- Solve word problems using a variety of strategies and defend their strategies.
- Model and solve 2-step word problems.
- Compose and decompose values to show a new representation of the value.
- Find equivalent fractions.

Language Objectives
- Speak to partners, teacher, and class using vocabulary.
- Discuss problem solving process and strategies.
- Explain how they decided to rename the target number.

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
volume
construction
defective
expensive
impossible

ELPS *(English Language Proficiency Standards)*
2E, 2J, 3E, 3F, 3J, 4F, 4K, 5B, 5G

Unit 2, Lesson 2 — Grades 7-8

Daily Routine

The following daily activities will help prepare your students for the Post-assessment. They are not optional.

ESSENTIAL

Measurement Lab
- Lesson 1 – Repeat Unit 1 Lesson 2, using a different set of boxes/rectangular prisms.
- **Lesson 2 – Repeat Unit 1 Lesson 3, using a different set of cylinders.**
- Lesson 3 – Percent of Increase in Size

Lesson 2 Materials
- cylinders (easy to cut apart such as oatmeal boxes, toilet paper rolls, paper towel rolls, etc.)
- Scissors
- Plain paper / pencil
- 1" Grid paper
- Ruler

Lesson 2 Student Groups
1) Carefully cut cylinders apart using the ruler to make a straight line down the curved surface.
2) Find the approximate area of each part of the cylinder.
3) Label each part with the area, number, and unit *(such as 24 in^2).*
4) Find the approximate surface area of the cylinder.
5) Write an explanation of how they found the surface area.
   *Remind students that the area of a circle is $\pi(r^2)$

Solve It! Multi-step problem solving
- Lesson 1 – partners, related problems
- **Lesson 2 – partners, 2-step problem**
- Lesson 3 – partners, 2-step problem

Fraction Action
- Lesson 1 – BLM Fraction Action and X Marks the Spot
- **Lesson 2 – BLM Fraction Action and X Marks the Spot**
- Lesson 3 – BLM Fraction Action and X Marks the Spot

***X* Marks the Spot**
- Lesson 1 – BLM Fraction Action and X Marks the Spot
- **Lesson 2 – BLM Fraction Action and X Marks the Spot**
- Lesson 3 – BLM Fraction Action and X Marks the Spot

Daily Routine - continued

CGI

- Lesson 1 – rate, measurement division
- **Lesson 2 – rate, multiplication (assessment item 7)**
- Lesson 3 – price, partitive (assessment item 6)

The following activities, although certainly developmentally appropriate for your 7th and 8th grade students, do not specifically address objectives assessed on the Post-assessment. Schools with shorter teaching spans can consider omitting some or all these activities as your time permits.

OPTIONAL

Target Number

- Lesson 1 – Target Number 48
- **Lesson 2 – Target Number 20**
- Lesson 3 – Target Number 100

Money Matters

(*If you have a full program and wish to use this optional activity, you will find BLMs and Explanations in the Optional Activities Tab of your Teacher's Guide*.)

Technology Option

Practice measuring the surface area of a cylinder online at: http://www.aaamath.com

Assessment Items

Students are introduced to and practice the skills necessary for success on the following assessment items: 1, 2, 3, 9

TEKS for this Unit

7th – 7.2,D; 7.3A;
8th -8.2AB; 8.3B, 8.5A

Unit 2 Lesson 2 – Daily Routines - Measurement Lab

One per student

Cylinder – Measurement Lab Record Sheet

Students should work in small groups.

Materials:

- Cardboard cylinders (easy to cut apart such as cereal, shirt, etc.)
- Scissors
- Plain paper / pencil
- 1" Grid paper
- Ruler

Task:

1) Find the approximate area of each of the parts of the cylinder.

2) Label each face with the area (number and unit – for example 24 in^2).

3) Find the surface area of the cylinder – that's the total area of all of the faces.

4) Draw the parts below to represent the faces, labeling each with dimensions and area.

Write an explanation of how you found the surface area of the cylinder.

Unit 2 Lesson 2 – Daily Routines - Measurement Lab

One per student

Cylindro – Laboratorio de medicion hoja de registro

Students should work in small groups.

Materiales:

- Cilindro de carton (fáciles de recortar, como cajas de cereales, etc.)
- Tijeras
- Papel y lápiz
- Papel con cuadrícula de 1 pulgada
- Regla

Tarea:

1) Encuentra el área aproximada de cada una de las caras del cilindro.

2) Etiqueta cada cara con su área (número y unidad – por ejemplo, 24 in^2).

3) Encuentra el área de la superficie del prisma rectangular – es decir, el área total de todas sus caras.

4) Dibuja rectángulos debajo para representar las caras, etiquetando cada una con sus dimensiones y su área.

5) Escribe una explicación de cómo encontraste el área de superficie del cilindro.

Unit 2 Lesson 2 – Daily Routines - Solve It! Problems (Pairs)

One per student

Work with your partner to answer the question.

Problem 3:
George's older friend, Michael, came to the carwash to have his father's car detailed. The "Clean" carwash cost $16.50. The "Shiny" carwash cost 25% more than the "Clean," and the "Detail" carwash was 75% more than the "Clean." If Michael purchased the "Detail," how much did he pay (excluding tax)?

Problem Solution Name:	**Solution Verification** Name:

Unit 2 Lesson 2 – Daily Routines - Solve It! Problems (Pairs)

One per student

Work with your partner to answer the question.

Problema 3:
El amigo mayor de George, Michael, fue al lavadero de autos para que limpiaran minuciosamente el auto de su padre. El lavado de autos "Limpio" cuesta $16.50. El lavado de autos "Reluciente" cuesta un 25% más que el "Limpio" y el lavado de autos "Minucioso" cuesta un 75% más que el "Limpio." Si Michael compró el "Minucioso," ¿cuánto pagó (sin incluir impuestos)?

Solución del problema Nombre:	**Verificación de la solución** Nombre:

Unit 2 Lesson 2 – Daily Routines – Fraction Action and *X* Marks the Spot

One per student

Fraction Action

Materials:

- Fraction Math Balance

Task:

Students work in groups today and use the fraction math balances to verify equivalencies of fractions for $\frac{3}{4}$. They must then write a description of how they could tell that the fractions they chose were or were NOT equivalent to $\frac{3}{4}$.

What percent of a whole pizza did they have left to put into the box?

X Marks the Spot

Solve for *x* in these two equations.

$7x = 105$	**$9x - 3 = 105$**

Unit 2 Lesson 2 – Daily Routines – Fraction Action and *X* Marks the Spot

One per student

Fraction Action

Materiales:

- Balance de matemáticas con fracciones

Tarea:

Hoy, los estudiantes trabajan en grupos y usan los balances de matemáticas con fracciones para verificar las equivalencias de fracciones para $\frac{3}{4}$. Luego, deben escribir una descripción de cómo pudieron saber que las fracciones que escogieron eran o NO eran equivalentes a $\frac{3}{4}$.

¿Qué porcentaje de una pizza entera han dejado para poner en la caja?

X Marca el sitio

Resuelve para *x* en estas dos ecuaciones.

$7x = 105$	**$9x - 3 = 105$**

Materials
- Class set of literature selection
- **BLM** Lesson 2, 3 Word Association Charts
- Domino Blast-Off Game

Literature Selection
Zack Proton and the Wrong Planet
by Brian Anderson

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
volume
construction
defective
expensive
impossible

ELPS *(English Language Proficiency Standards)*
2C, 2J, 3B, 3J, 4F, 5B, 5G

Technology Option
Students could create their word association charts on the computer, as could the teacher.

Unit 2, Lesson 2 — Grades 7-8

Classroom Lesson

Every day teachers must post the objectives on the board, read them to the students, and have students read them together with the teacher. At the end of the lesson, teacher and students should review to see if they have accomplished both math and language objectives.

Math Objectives:

- Observe and find patterns within an equivalent ratios chart.

Reading Objective:

- Analyze the impact of alliteration on meaning and tone in a text.
- Understand characters by inferring what the author is really trying to say about them.

Language Objectives:

- Use the literature vocabulary to create Visual-Verbal Word Associations and share them with peers.
- Identify alliterations in a text and create alliterations.
- Explain how to use a multiplication chart to find equivalent fractions.
- Discuss with peers the patterns within an equivalent ratios chart.

BEFORE READING

Building Background – Vocabulary

Ask students to retell their favorite part of the book so far with a partner. Make sure they are very specific and include details in their rendering. Circulate and listen in to different partnerships until their sharing is completed.

Regroup the class and tell students that to help them talk about what has happened so far to Zack Proton, you will help them practice how to use the new vocabulary words they have learned. They will use the Visual-Verbal Word Association sheet to help internalize their understanding of the vocabulary. Give students three copies of the Word Association sheet.

Comprehensible Input - Vocabulary

Visual-Verbal Word Association activity

Model and practice the process with students using one of the vocabulary words: ***volume***.

Classroom Lesson - continued

- Box 1:
  Model: Write the word *volume* on the record sheet in the top left rectangle and pronounce the word.
  Practice: Students copy the word in their own graphic organizer.

- Box 2:
  Model: Explain a definition for *volume* in your own words. Write this definition in the lower left hand rectangle. You may want to contrast this definition of *volume* with the mathematical meaning of the word (the *volume* of a 3-D figure).
  Practice: Students copy this definition in their own graphic organizer.

- Box 3:
  Model: Show students how you think of a personal relationship you have with the word by using it in a sentence. Write that sentence in the upper right hand rectangle.
  Practice: Students talk with a partner to share their own sentence using the word. If students struggle to correctly use the word in a sentence, model another example or two for them to clarify the word's meaning and how to use it. Have students write their original sentence in their own graphic organizer.
  ELLs: Beginning and early intermediate ELLs can write the sentence in their native language if necessary, or very closely model their sentence on the teacher's example.

- Box 4:
  Model: Think aloud what a non-example could be for the word and write that in the lower right rectangle. For *volume* a non-example could be *silence.*
  Practice: Students copy this non-example in their own graphic organizer.

Practice and Application - Vocabulary

Visual-Verbal Word Association activity

Have students work with a partner to create a Visual-Verbal Word Association sheet for two words:

- **construction**
- **defective**

ELLs: While students work independently on this activity, you can meet with a small group of beginning and intermediate ELLs to create the four parts of the Visual-Verbal Word Association posters collaboratively.

Mini-Unit Science Fiction

Here is an interesting student-developed mini-unit on science fiction which might be adaptable to this time in your studies.
http://faculty.rcoe.appstate.edu/smithtw/RE_3150_web/Craft_Minilessons/Craft_lessons.htm

Think and Write

Omega Chimp only eats bananas. If you could only eat one food, what would you want it to be? Write a paragraph describing the food and explain why that would be your choice.

Classroom Lesson - continued

For the "personal relationship" part, model how to use the word in a sentence, and write the sentence down so they can see it. Have your ELLs create a similar sentence based on your model.

Have students share with four other people in the room. Tell everyone to stand and on the word "TRAVEL," find someone to share their word associations with. After 30 seconds, teacher says "TRAVEL," and they each find someone new to share with. Repeat two more times until everyone has shared four times.

Charts should then go into the students' vocabulary journals.

Building Background – Literature

Alliteration

The main focus for today's reading is to analyze the impact an author's use of alliteration has on the meaning and tone of the text. To introduce what alliteration is:

1. Tell students that your favorite part so far was on page 21 when the characters beamed down to the planet and found themselves surrounded by thousands and thousands of pigs. Reread pages 21-23 to students, to remind them about that part.

2. Say, "I think the reason I like this part so much is because of the words the author used to describe what was happening in that moment:
   - what a **humongous herd of hogs**
   - what a **sizeable swarm of swine**
   - what a **seriously sickening stench**
   - hopped around like **pesky pink popcorn**
   - Omega Chimp disappeared under a **horde of hungry pigs**"

3. Explain: The author used the same sound at the beginning of these words. When an author chooses words so they all start with the same sound, it is called alliteration. Why do you think the author used alliteration in this part?

4. Call on a few students to share their ideas with the class. Help them see that the alliteration really makes the reader pay attention to that part – it shows just how surprising the moment was for Zack and Omega Chimp.

Classroom Lesson - continued

5. Add these examples of alliteration to an Alphabet Taxonomy – an alphabetical list of words related to a particular topic *(in this case, alliteration)*. Tell students that as you read today, if they hear any more examples of alliteration they should give a thumbs-up and you will add it to the chart.

See example chart below, with alliteration examples from pages 21-23 and today's chapters (Chapters 6-11) already included. The Alphabet Taxonomy will fit perfectly on a piece of chart paper, but you can also use technology to create one.

DURING READING
Comprehensible Input – Literature & Vocabulary
You will read chapters 6 – 11 today, skipping the "comic" dream inserts which lose something in oral interpretation. If you are doing the timeline or story map activity, place the first one or two major events from the plot.

During the read aloud, the goal is to support students' comprehension of the text by modeling and practicing reading strategies:

- **Analyzing Word Choice: Alliteration**
- **Inferring**

This section indicates places in the text where you can:

- Briefly pause to model a reading strategy by thinking aloud.
- Briefly pause to have students practice a reading strategy by answering a question you pose.

Keep in mind that pausing the reading for too long at any of these places will make the reading very disconnected. This interferes with students' comprehension and enjoyment of the text, so keep the reading as fast-paced as possible.

You may want to mark the following stopping points in the text with sticky notes, indicating what you will say to students.

Unit 2, Lesson 2 — Grades 7-8

Classroom Lesson - continued

Example of Alliteration Chart, filled in by the end of today's reading:

Alliteration
Why use it? (Include students' ideas here. Some possible reasons are listed.) - *to emphasize a particular event or feeling* - *to draw the reader in to what's going on in that moment* - *to make that part humorous*
A
B
C p. 79 cosmic criminal
D
E
F p. 79 foul, funny felon
G p. 79 galactic goblin
H p. 21 humongous herd of hogs p. 23 horde of hungry pigs
I
J
K
L p. 61 "Leapin' leptons!"
M p. 79 monkey menace
N
O
P p. 23 pesky pink popcorn p. 50 pace proudly in your pajamas past the pigs
Q
R p. 65 raced randomly
S p. 21 sizeable swarm of swine p. 22 seriously sickening stench
T
U
V
W
X
Y
Z

p. 50 Analyze Word Choice: Alliteration
"pace proudly in your pajamas past the pigs"

- Teacher Question: Why did the author use alliteration here?
- How does it change the **tone**? For example, does it make the text:
  - more **serious**?
  - more **playful**?
  - more **humorous**?

- more **informal**?
- more **formal**? etc.

- How does it change the **meaning**? For example, does it:
  - put more emphasis on this event?
  - make us think differently about this part of the story?

p. 50 Inferring

- Teacher Think Aloud: On this page, Zack says: "Sometimes it can be very hard to tell the difference between a genuine intergalactic space hero and a fool." Then Effie says: "I have that problem a lot." I think what Effie really means is that he has trouble telling if Zack is a space hero or a fool. As we keep reading we'll see if Zack seems more like a hero, or more like a fool.

p. 59 Inferring

- Teacher Question: What does this part show you about Zack? Does he seem more like a hero, or more like a fool? Talk with your partner.

When you regroup the class, have them share their ideas, and make sure they notice that Omega Chimp seems more rational and more like a leader than Zack does.

p. 61 Analyze Word Choice: Alliteration
"Leapin' leptons!"

- Teacher Question: Why did the author use alliteration here?
- How does it change the **tone**?
- How does it change the **meaning**?

p. 59 Inferring

- Teacher Question: What does this part show you about Zack? Does he seem more like a hero, or more like a fool? Talk with your partner.

When you regroup the class, have them share their ideas, and make sure they notice that Omega Chimp seems more rational and more like a leader than Zack does.

p. 63 Inferring

- Teacher Question: What is Omega Chimp really trying to say? Talk with your partner.

Unit 2, Lesson 2 — Grades 7-8

Classroom Lesson - continued

p. 65 Analyze Word Choice: Alliteration
"raced randomly"

- Teacher Question: Why did the author use alliteration here?
- How does it change the **tone**?
- How does it change the **meaning**?

p. 70 Inferring

- Teacher Think Aloud: That was a very smart way for Omega Chimp to solve the problem. He seems like more of a space hero than Zack, who never seems to be able to solve any of the problems they face. Maybe the author is trying to show us that even an animal – a chimp – is smarter than Zack, to show how foolish he really is.

p. 79 Analyze Word Choice: Alliteration
"foul, funny felon;" "cosmic criminal;" "monkey menace;" "galactic goblin"

- Teacher Question: Why did the author use so much alliteration here?
- How does it change the **tone**?
- How does it change the **meaning**?

"People on orbiting spacecraft **float freely and fearlessly forever** in microgravity."

Transition to Math

If you did not teach Domino Blast Off Game at the end of the last lesson, please teach it now. After students have played a few rounds, facilitate the following discussion.

Duplicate for every student the Suggested EQUIVALENT RATIOS chart for the Domino Blast Off Game. Discuss the patterns they can see in the chart.

What other chart does this remind them of? *(multiplication)*
Why – each row is a set of multiples.
Why does this arrangement create EQUIVALENT RATIOS?

Let students talk to one another to come to conclusions. Do not provide the answer today – let them think about it. As each idea is brought to the large group, have the large group check the idea against all possibilities in the chart. Does the idea work consistently, or just with a few pair?

Objectives

Review both language and math objectives, making sure students understand how they accomplished each.

Unit 2 Lessons 2, 3 – Classroom Lesson

Print multiple copies for students and have available for use at any time during the summer session.

Vocabulary Building: Visual-Verbal Word Association

Vocabulary Term/Término de vocabulario	**Personal Association/Asociación personal**
Definition/Definición	**Non-Example/No es ejemplo**

Vocabulary Term/ Término de vocabulario	**Personal Association//Asociación personal**
Definition/Definición	**Non-Example/No es ejemplo**

Materials
- pencil and paper
- 4-function calculator
- 3ft x 1.25ft paper

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
volume
construction
defective
expensive
impossible

ELPS *(English Language Proficiency Standards)*
2D, 2G, 2J, 3B, 3E, 3H, 4K, 5B, 5G

Unit 2, Lesson 2 — Grades 7-8

Math Lesson

Math Objectives:
- Convert measurements in order to have consistent units for solving equivalent ratios.
- Estimate area of rectangles *(the size of Vietnamese Pigs)*.
- Calculate area of rectangles *(the size of Vietnamese Pigs)*.
- Set up a ratio involving an unknown *(x)*.
- Use any strategy to solve for an equivalent ratio.

Language Objectives:
- Discuss problem solving strategies with peers.
- Explain how to convert one unit of measure to another unit of measure.
- Explain your personal problem solving strategy to peers.

Building Background
In Lesson 1 we found the area that pig pictures measuring one-inch by two-inches would cover, and we used ratio to help us find not only the number of pigs that would cover a certain area; but also the area that a certain number of pigs would cover.

In today's lesson, we're going to talk about REAL pigs. I found the average dimensions of a small pig, the Vietnamese (Pot-bellied) Pig which are dwarf swine. We read the article in lesson 1, then used the paper 2 x 1 to visualize. Let's use the real pig measurements today.

Comprehensible Input
These pigs grow to about 3 feet long and 15-inches tall. Suppose I wanted to find out how much area these pigs would cover if they were to lie down to take up the 3 feet long by 15 inches tall space? What would I have to do? Talk for a little about these two measures. Be careful, I'm being tricky! *(Pause for a bit.)*

First of all, look at our measurements – one of the measurements is in feet, the other is in inches. I need to convert either the feet to inches or the inches to feet so that I can find a common square unit. *(Write all of this down, and speak slowly so students can follow your thinking.)*

1 foot = 12-inches,
So, 3 feet = 3 x 12 or 36-inches.
So this little pig is 3 feet or 36-inches long.

Unit 2, Lesson 2 — Grades 7-8

Math Lesson - continued

Now let's look at the height.
1 foot = 12-inches. So the 15-inch height is more than 1 foot.
15 -12 = 3-inches more. To find what fractional part of the foot, I can see that this 3-inches out of 12-inches = $\frac{3}{12}$, which I can simplify to $\frac{1}{4}$ of a foot.

So the little pig is 1 and $\frac{1}{4}$ feet tall.

Hmm, I could also change that fraction to a decimal. 1/4 is the same as 1 quarter or 0.25 *(twenty-five hundredths, not point 25)*. The height could also be expressed as 1.25 *(1 and twenty-five hundredths)* feet.

So, should I use inches, or should I use feet?

3 feet long, 1.25 feet tall OR
36-inches long, 15-inches tall.

I've made a rectangle that is just about the same size as this little pig. *(Show students the rectangle.)* This is how much area one of these little Vietnamese Pigs would cover lying down. For a "dwarf," he sure covers a lot of area!!

I think I'll use inches. Even though the numbers will get pretty big, I won't need to worry about fractions or decimals.

So this rectangle which represents the pig measures 36-inches by 15-inches. What is the area of this rectangle? 36 x 15 = 540 square inches

One Vietnamese Pig would cover an area of 540 square inches. That's a ratio of 1 to 540, 1:540 or $\frac{1 \text{ pig}}{540 \text{ square inches}}$

So how much area would 10 of those pigs cover? We'll let *x* represent the unknown area. $\frac{1}{540}$ $\frac{10}{x}$

Using the two strategies from Lesson 1, I know I have to multiply the first numerator by 10 because 10 x 1 = the second numerator, 10. And if I multiply the numerator by 10, I must multiply the denominator by 10 so I'm multiplying by a form of ONE and the ratio stays EQUIVALENT. $\frac{10}{10} \times \frac{1}{540} = \frac{10}{5400}$

Ten pigs when lying down would cover an area of 5400 square inches!!!!

$$\frac{1}{540} \times \frac{10}{x}$$

Or, we also cross multiplied. This is a one-stepper and shows that x = 5400

I wonder how many square feet that would be? Take time out to talk in your class to see what we would do to convert 5400 square inches into square feet.

Well, 1 square foot is like a 12" floor tile; it is 12" x 12." The area of a square foot, then is 12 x 12 or 144 square inches.

Can I use this information and ratio to find out how many square feet there are in 5400 square inches? See if you can set up a ratio with a partner – don't solve it, just set it up**.** ***(pause)***

$$\frac{\textbf{1 sq foot}}{\textbf{144 sq inches}} \qquad \frac{\textbf{x sq feet}}{\textbf{5400 sq inches}}$$

This is one ratio. Notice that I am comparing square feet to square inches in both ratios. But you could have inverted each of the ratios and compared square inches to square feet. As long as you are consistent about what you are comparing, your ratios will be consistent.

$$\frac{1}{144} \times \frac{x}{5400}$$

$$144x = 5400$$

To solve for *x* I'll need to divide both sides by 144. Use your calculator while I use mine.

$$x = 37.5$$

What does *x* represent?
The number of square feet the pigs would cover.
37.5 square feet

(Repeat this process for 100 pigs, but before you go through the steps, ask students to estimate the area they think 100 pigs would cover. Repeat the estimation and steps for 1000 pigs, for 10,000 pigs, and finally for 1,000,000 pigs.)

	Unit 2, Lesson 2 **Grades 7-8** **Math Lesson** - continued  --- Now, how many pigs were on Bounceback Planet? *(16 million)* How much area would THEY cover lying down? And those are DWARF pigs!!! During the follow-up lesson, you and a partner are going to investigate another size pig, this one was named Hogzilla, and was reported to have been the largest hog ever seen in recorded history. It was a whopping 12 feet long *(according to eye witnesses)*. Wonder how much area 16 million of those hogs would cover? You'll find out during the follow-up lesson. **MAS Space** *Discuss the assignment. You might want to demonstrate the fraction balance in case some classes didn't get that opportunity.* During Fraction Action in the Daily Routines, you have been using a fraction balance to compare fractions and find equivalent fractions. Why does the balance beam balance horizontally when you have equivalent fractions? Write a class explanation and share it online. **Objectives:** Read through the math and language objectives, making sure that students understand how they accomplished each.

Materials
- **BLM** Hogzilla
- 3ft x 12ft of butcher paper
- yard stick
- **BLM** Recursive Review Lessons 1-3

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
volume
construction
defective
expensive
impossible

Technology Option
Students might like to research Hogzilla to find out more facts about this amazing animal.
WARNING – It is a hunting story.

ELPS *(English Language Proficiency Standards)*
2D, 2G, 2J, 3B, 3E, 3H, 4K, 5B, 5G

Unit 2, Lesson 2 — Grades 7-8

Follow-up

Math Objectives:
- Create a rectangle that will have dimensions (length and width) and area representing Hogzilla.
- Set up a ratio involving an unknown (x).
- Use any strategy to solve equivalent ratios.
- Make estimates and measurements to compare Hogzilla's area with the area of another object.

Language Objectives:
- Discuss problem solving strategies with peers.
- Explain problem solving strategies to peers.
- Talk about the size of Hogzilla and how it compares to the size of other objects.
- Write about the usefulness of equivalent ratios in comparing size of objects.

Hogzilla was an actual boar that was shot on a Georgia plantation in 2004. Although many measurements were given, none gave the height of the animal. Students will use the information on the BLM about this beast, as well as the proportions they have been using for the Vietnamese Pig, to calculate the area that 16 million Hogzillas would cover!

Practice and Application
Once you are certain students understand the assignment, let them work. Circulate the room to ask question that clarify and probe.

QUESTIONS
- Explain how you are finding the EQUIVALENT RATIO.
- What did you visualize when you first looked at the problem to estimate a reasonable answer?
- Which method of solving for equivalent ratios do you prefer for these ratio problems? Why?

Recursive Review
BLM *Recursive Review has answer choices. *Hint - label each part of the answer choice ratios to see which equation represents this situation.*

- The average dandelion grows 6 inches tall and has a flower diameter of 2 inches. If a gigantic dandelion grew to 2 feet tall and was in proportion to the average, which ratio could be used to find the expected diameter of the flower?

	Unit 2, Lesson 2 **Grades 7-8** **Follow-up** - continued  --- **Writing Topics** **Independent Writing Topic** Students will have a daily writing activity which will incorporate the day's focus math vocabulary. ▪ Explain how knowing about equivalent ratios helped you solve today's Follow-up problems. **Objectives** Review the math and language objectives to make sure that they were accomplished and that the students realize how they were accomplished.

Unit 2 Lesson 2 – Follow-up

One per student

Hogzilla

Students will work in small groups to complete the activity.

Hogzilla was the name given to a monster boar killed in Georgia on a hunting plantation in 2004. The animal, according to eye witnesses, measured 12 feet long. They did not, however, give a height for the animal.

If we assume that this huge boar grew in the same proportions as the Vietnamese Pigs, you can use ratio and proportion to find the height of this gigantic boar.

Task A:

1) Find an approximate height of Hogzilla, using the Vietnamese Pig measurements for your ratio.

2) Create a rectangle of paper that will represent the area Hogzilla would cover if lying down.

Task B:

Choose one activity below to complete.

3) Determine how much area 16 million of these gigantic boars would cover.

4) Measure a very large area on the school property. How many Hogzillas, when lying down, would cover this area?

Unit 2 Lesson 2 – Follow-up

One per student

Hogzilla

Students will work in small groups to complete the activity.

Hogzilla fue el nombre que le pusieron a un jabalí gigantesco que cazaron en un campo de caza en Georgia en 2004. De acuerdo con testigos, el animal medía 12 pies de largo. Nunca se dijo cuánto medía de altura el animal.

Si asumimos que este enorme jabalí tenía las mismas proporciones que los cerdos vietnamitas, puedes usar razones y proporciones para encontrar la altura de este gigantesco jabalí.

Tarea A:

1. Encontrar una altura aproximada de *Hogzilla* usando las medidas del cerdo vietnamita para hacer una razón.

2. Crear un rectángulo de papel que representará el área que *Hogzilla* cubriría acostado

Tarea B:

Escoge una actividad a continuación a completar.

1. Determinar qué área cubrirían 16 millones de estos jabalíes gigantescos.

2. Medir un área muy grande en los terrenos de la escuela. ¿Cuántos *Hogzillas* acostados cubrirían esta área?

Materials
- 2 paper dessert plates
- 2 paper towels
- 1 plastic knife
- 2 pieces wax paper
- 2 pair of scissors
- 2 cups trail mix (pre-packaged or home-made)

All items listed above per partner pair
- **BLM** Trail Mix-Snack Fractions

Math Objectives
- Use addition, subtraction, multiplication and division to solve problems involving fractions and decimals.
- Convert between fractions, decimals, whole numbers and percents.
- Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios).
- Estimate and find solutions to application problems involving percent.

Language Objectives
- Discuss how ratios and proportions can be used to solve real-world problems.

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
volume
construction
defective
expensive
impossible

Teacher Note
There is a difference in weight ounces and liquid volume ounces. One question on the BLM does differentiate the two measures.

Unit 2, Lesson 2 — Grades 7-8

Snack Fractions

Students should wash their hands before this activity if using food items.

Snack Fractions
Students should have the skills to answer these in small groups. Have the students work through the BLM before sharing the actual snack.

The materials list states that students will be provided two cups of trail mix to share between partners. This measurement is NOT intended to be used for the Snack Fraction questionnaire. Students are to use the measurements given in the recipe on the **BLM** Trail Mix-Snack Fractions. Simple home-made trail mix could be:

1/2 cup pecans
1/2 cup semi-sweet chocolate chips
1/2 cup granola
1/2 raisins

Circulate the room while students are working on the BLM, asking questions as needed to guide, redirect, extend:

?QUESTIONS:
- How will you find the total yield of these ingredients?
- Explain how to find your fourth.
- How can proportion help you to increase the recipe to serve 15?
- *This question talks about weight measure and volume measure. Tell me what you think this problem is explaining (*that although 4 ounces liquid measure is half a cup, because dried fruit weighs more than water, 4 ounces of weight measure of dried fruit is less than half a cup – 1/3 cup in fact*).
- If you were making this trail mix, what dried fruit would you use and in what proportions within the cup?

Finally, let them share the trail mix with a partner.

(*Naturally, if you think the portions suggested in the materials list are too small for a middle schooler's snack, feel free to increase the amounts; make sure, though, that you make the amounts easily divided in halves – they've already done a great deal of work to get the snack.)*

Snack Fraction Journal Writing: BLM Trail Mix Snack Fractions
Explain how you determined the amount of ingredients needed for 10 people.

Objectives: Review the objectives with the class, making sure they understand how they achieved each.

Unit 2 Lesson 2 – Snack Fractions

One per student

Trail Mix – Snack Fractions

Recipe for Terrific Trail Mix

- 1 cup combination diced dried fruit such as prunes, apricots, pears and apples.
- 1/2 cup raisins and/or dried cherries
- 1.5 cups unsalted sunflower seeds
- 1 cup unsalted dry-roasted peanuts

What percent of the one cup of dried diced fruit would you want each fruit to be?

If four of you are sharing this snack, what would the volume measure be for your portion?

Dried fruit is $3.59 for a 4 ounce (weight measure) package. The weight measure of 4 ounces of dried fruit is about a third of a cup of liquid volume measure. What would the dried fruit cost for your portion? For the portion that all four people would share? For the entire class?

Increase the ingredient amounts to feed 12 people instead of the four for which this recipe is intended.

Unidad 2 Lección 2 – Fracciones de refrigerios

Una por estudiante

Granola – Fracciones de refrigerios

Receta para una increíble granola

- 1 taza combinada de frutas secas cortadas en dados, tales como ciruelas pasas, albaricoques, peras y manzanas.
- 1/2 taza de uvas pasas o cerezas secas
- 1,5 taza de semillas de girasol sin sal
- 1 taza de cacahuetes tostados sin sal

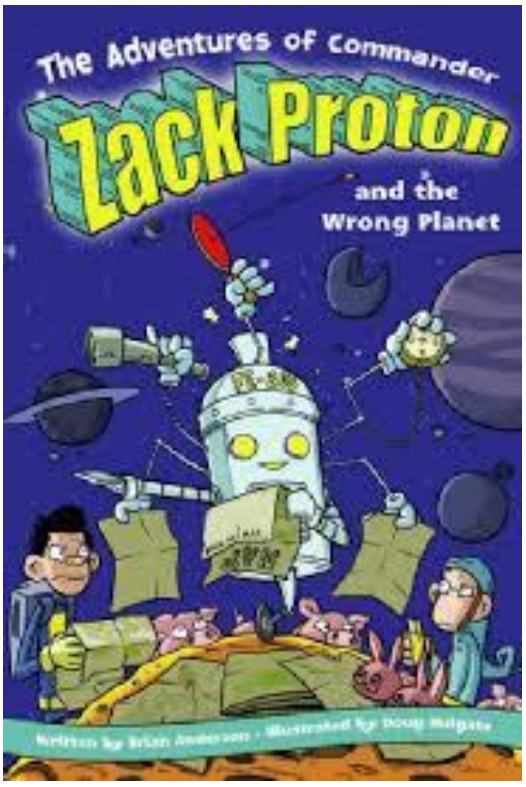
¿Qué porcentaje de la taza de frutas secas cortadas en cubos desearías que fuese cada fruta?

Si comparten este refrigerio entre cuatro, ¿cuál sería la medida de volumen para tu porción?

La fruta seca cuesta $3.59 por un paquete de 4 onzas (medida de peso). La medida de peso de 4 onzas de frutas secas es aproximadamente un tercio de una taza de la medida de volumen del líquido. ¿Cuánto costaría la fruta seca para tu porción? ¿Para la porción que las cuatro personas compartirían? ¿Para toda la clase?

Aumenta la cantidad de ingredientes para alimentar a 12 personas en vez de alimentar a las cuatro para las que esta receta está pensada.

Unit 2 Lesson 2 – Family Fun



Dear _____,

We continued reading ***Zack Proton and the Wrong Planet*** today.

My favorite math activity today was…

_____

because…

_____
_____
_____
_____
_____

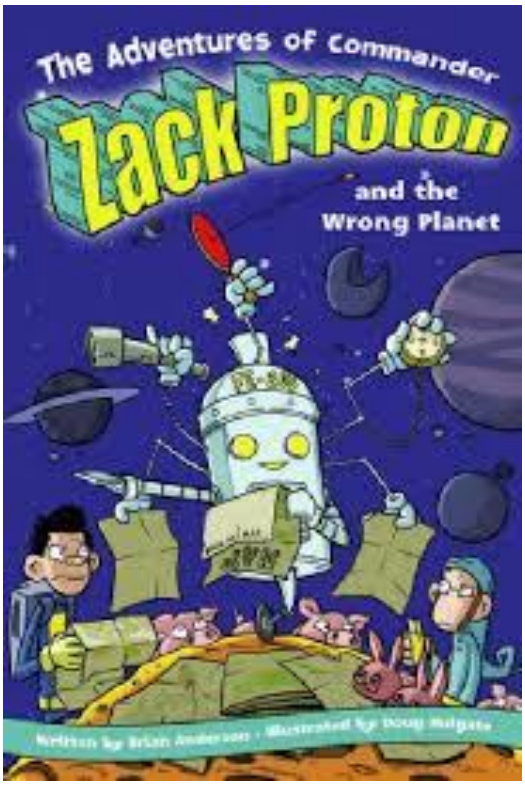
My teacher would like for us to:

- Find a stuffed animal (dimensions of length and width) and use equivalent ratios to determine how big its real-life counterpart might be.

Sincerely,

_____

Unit 2 Lesson 2 – Family Fun



Querido/a_____,

Hoy continuamos con la lectura de
Zack Proton y el planeta equivocado hoy.

Mi actividad de matemáticas favorita fue…

_____

porque…

_____
_____
_____
_____
_____

A mi maestro/a le gustaría que nosotros:

- Encontrar un animal de peluche (dimensiones de longitud y anchura) y usar las razones equivalentes para determinar lo grande sería si fuera real.

Atentamente,

_____

Materials
- **BLM** Percent of Increase in Size-Measurement Lab Record Sheet
- **BLM** Percent of Increase in Size-Sample Story
- **BLM** Solve It! Problem 4-5
- **BLM** Fraction Action and *X* Marks the Spot
- **BLM** Lessons 1-3 CGI ***Zack Proton and the Wrong Planet*** (listed in Lesson 1)

Math Objectives
- Solve word problems using a variety of strategies and defend their strategies.
- Model and solve 2-step word problems.
- Compose and decompose values to show a new representation of the value.
- Find equivalent fractions.

Language Objectives
- Speak to partners, teacher, and class using vocabulary.
- Discuss problem solving process and strategies.
- Explain how they decided to rename the target number.

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
volume
construction
defective
expensive
impossible

ELPS *(English Language Proficiency Standards)*
2C, 2D, 2J, 3B, 3D, 3H, 4F, 4K, 5B, 5G

TEKS for this Unit
7th – 7.2,D; 7.3A;
8th -8.2AB; 8.3B, 8.5A

Unit 2, Lesson 3 Grades 7-8

Daily Routine

The following daily activities will help prepare your students for the Post-assessment. They are not optional.

ESSENTIAL

Measurement Lab:
- Lesson 1 – Repeat Unit 1 Lesson 2, using a different set of boxes/rectangular prisms.
- Lesson 2 – Repeat Unit 1 Lesson 3, using a different set of cylinders.
- **Lesson 3 – Percent of Increase in Size**

Lesson 3 Materials
- set of five fruits or vegetables per group of four students (Ex: five oranges of differing sizes)
- tape measure
- chart paper
- grid paper
- markers
- 4-function calculator

Lesson 3 Student Groups
1) Order food items in any size sequence and measure circumference of each piece.
2) Calculate the percent increase or decrease between each piece.
3) Create a poster including: data table and graph
4) Present to class utilizing information to explain the growing process of the fruits/vegetables.
5) Write a creative story describing the food items change in size over time.

Solve It! Multi-step problem solving
- Lesson 1 – partners, related problems
- Lesson 2 – partners, 2-step problem
- **Lesson 3 – partners, 2-step problem**

Fraction Action
- Lesson 1 – BLM Fraction Action and X Marks the Spot
- Lesson 2 – BLM Fraction Action and X Marks the Spot
- **Lesson 3 – BLM Fraction Action and X Marks the Spot**

***X* Marks the Spot**
- Lesson 1 – BLM Fraction Action and X Marks the Spot
- Lesson 2 – BLM Fraction Action and X Marks the Spot
- **Lesson 3 – BLM Fraction Action and X Marks the Spot**

Daily Routine - continued

CGI

- Lesson 1 – rate, measurement division
- Lesson 2 – rate, multiplication (assessment item 7)
- **Lesson 3 – price, partitive (assessment item 6)**

The following activities, although certainly developmentally appropriate for your 7th and 8th grade students, do not specifically address objectives assessed on the Post-assessment. Schools with shorter teaching spans can consider omitting some or all these activities as your time permits.

OPTIONAL

Target Number

- Lesson 1 – Target Number 48
- Lesson 2 – Target Number 20
- **Lesson 3 – Target Number 100**

Money Matters

(*If you have a full program and wish to use this optional activity, you will find BLMs and Explanations in the Optional Activities Tab of your Teacher's Guide*.)

Technology Option

Practice measuring the surface area of a cylinder online at: http://www.aaamath.com

Assessment Items

Students are introduced to and practice the skills necessary for success on the following assessment items: 1, 2, 3, 9

Unit 2 Lesson 3 – Daily Routines - Measurement Lab

One per student

Percent of Increase in Size – Measurement Lab Record Sheet

Students should work in small groups.

Materials:

- set of five fruits or vegetables per group of four students (Ex: five oranges of differing sizes)
- tape measure
- chart paper
- grid paper
- markers
- 4-function calculator

Task:

1) Order food items in any size sequence and measure circumference of each piece.

   piece #1 _____ piece #2 _____

   piece #3 _____ piece #4 _____

   piece #5 _____

2) Calculate the percent increase or decrease between each piece. Note whether it was an increase or decrease.

   piece #1 ___0%____ piece #2 _____

   piece #3 _____ piece #4 _____

   piece #5 _____

3) Create a poster including: data table and graph

4) Present to class utilizing information to explain the growing process of the fruits/vegetables.

5) Write a creative story describing the food items change in size over time. Use as many vocabulary terms as you can.

Unidad 2 Lección 3 – Rutinas diarias - Laboratorio de medición 

Una por estudiante

Porcentaje de aumento en tamaño - Hoja de registro del laboratorio de medición

Los estudiantes deben trabajar en grupos pequeños.

Materiales:

- juego de 5 frutas o vegetales por grupo de 4 estudiantes. (Ejemplo: 5 naranjas de distintos tamaños).
- cinta métrica
- papel gráfico
- papel con cuadrícula
- marcadores
- calculadora de 4 funciones

Tarea:

1) Ordena los alimentos en cualquier secuencia de tamaño y mide la circunferencia de cada pieza.

   pieza n.º 1 _____ pieza n.º 2 _____

   pieza n.º 3 _____ pieza n.º 4 _____

   pieza n.º 5 _____

2) Calcula el porcentaje del aumento o de la disminución entre cada pieza. Anota si fue un aumento o una disminución.

   pieza n.º 1 ___0%____ pieza n.º 2 _____

   pieza n.º 3 _____ pieza n.º 4 _____

   pieza n.º 5 _____

3) Crea un póster que incluya: tabla de datos y gráfico

4) Preséntalo ante la clase usando la información para explicar el proceso de crecimiento de las frutas/vegetales.

5) Escribe una historia creativa en la que describas el cambio del tamaño de los alimentos en el tiempo. Utiliza la mayor cantidad de términos del vocabulario posible.

Unit 2 Lesson 3 – Daily Routines - Measurement Lab

One teacher copy

Percent of Increase in Size – Sample Story

Teacher: Read this to the class to inspire a creative story about their fruit or vegetable. Read before they start the Measurement Lab as it can help them determine their size sequence. Allow them to be as creative and detailed as they want. Have fun with this activity.

Measurement sequence 6in, 8in, 12in, 9in, 4in:

The Life of Mr. Orange

This orange measuring 6 inches in circumference, is the first piece in our orange saga. The rain fell and the breezes blew, making the leaves twitch on the trees; and orange grew a little bigger to this 8-inch circumference beauty. The sunshine sent its warm rays to ripen orange, and orange grew to this 12-inch circumference beauty and was harvested. The worker pulled and tugged until the orange was yanked off the limb and fell into a wooden crate. Orange sat in a roadside stand for days and lost some of its plumpness, drying down to this 9-inch circumference orange. Finally, all speckled with age, orange withered to only a 4-inch circumference before it was heaved into the compost which was later fetched to fertilize the orange grove.

La vida del Sr. Naranja

Esta naranja, cuya circunferencia mide 6 pulgadas, es la primera pieza en nuestra saga de naranjas. Cayó la lluvia y sopló la brisa, haciendo que las hojas se sacudieran en los árboles. Y la naranja creció un poco más, hasta alcanzar una belleza con una circunferencia de 8 pulgadas. La luz solar envió sus cálidos rayos e hizo que la naranja madurara, y la naranja creció hasta alcanzar una belleza con una circunferencia de 12 pulgadas, y luego fue cosechada. El trabajador jaló y tiró hasta arrancar la naranja de la rama de un tirón, y esta cayó en un cajón de madera. La naranja se sentó en un puesto al costado de la ruta durante días, y perdió algo de su corpulencia, secándose hasta convertirse en una naranja con una circunferencia de 9 pulgadas. Finalmente, toda manchada por la edad, se marchitó, y su circunferencia se redujo a solo 4 pulgadas antes de que se la arrojara como abono, lo que luego se utilizaba para fertilizar el huerto de naranjas.

Unit 2 Lesson 3 – Daily Routines - Solve It! Problems (Pairs)

One per student

Solve your own problem today, showing your work. Verify your partner's problem solution when you both finish your own. Discuss your work.

Partner #1 - Problem 4:

The carwash was running a special for the week. If you paid the full price of $16.50 for the "Clean" wash on one car, you would get 15% off the price of the "Shiny" wash for a second car. The regular price of the "Shiny" wash is 25% more than the "Clean." If a family brought in two cars, how much would they pay to have both cars washed using this special?

Problem Solution Name:	**Solution Verification** Name:

Unit 2 Lesson 3 – Daily Routines - Solve It! Problems (Pairs)

One per student

Solve your own problem today, showing your work. Verify your partner's problem solution when you both finish your own. Discuss your work.

Compañero # 1 - Problema 4:

El lavadero de autos tenía una oferta especial para la semana. Si pagaras el precio total de $16.50 por el lavado "Limpio" en un auto, obtendrías el 15% de descuento del precio del lavado "Reluciente" para un segundo auto. El precio normal del lavado "Reluciente" era un 25% más que el del "Limpio". Si una familia llevara dos autos, ¿cuánto pagarían para que les laven los dos autos usando esta oferta especial?

Solución del problema Nombre	**Verificación de la solución** Nombre

Unit 2 Lesson 3 – Daily Routines - Solve It! Problems (Pairs)

One per pair

Solve your own problem today, showing your work. Verify your partner's problem solution when you both finish your own. Discuss your work.

Partner #2 - Problem 5:

Justin was buying chemicals for the car wash. Detailer's Waterless Auto Wash Concentrate was $18.99 a bottle. The individual squirt bottle used by the employees was $14.99. There was also a kit available that included the concentrate and the individual squirt bottle for $23.99. Justin bought the kit. How much did he save buying the kit rather than the two items individually?

Problem Solution Name:	**Solution Verification** Name:

Unit 2 Lesson 3 – Daily Routines - Solve It! Problems (Pairs) 

One per pair

Hoy, resuelve tu propio problema, mostrando el procedimiento. Verifica la solución de tu compañero cuando ambos terminen de hacerlo por sí mismos. Hablen sobre su trabajo.

Compañero # 2 - Problema 5:

Justin estaba comprando productos químicos para el lavado del auto. La botella del Líquido concentrado para lavado de autos minucioso sin agua salía $18.99. La botella rociadora individual que usaban los empleados salía $14.99. Además, había un kit disponible que incluía el líquido concentrado y la botella rociadora individual por $23.99. Justin compró el kit. ¿Cuánto ahorró comprando el kit en lugar de comprar los dos artículos por separado?

Problem Solution Name:	**Solution Verification** Name:

Unit 2 Lesson 3 – Daily Routines – Fraction Action and *X* Marks the Spot

One per student

Fraction Action

Materials:
None for this activity

Task:

Gary ate $\frac{3}{8}$ of a pizza for dinner, and then ate $\frac{1}{4}$ of the pizza the next day for lunch. What fractional part of the pizza was left after lunch?

X Marks the Spot

Solve for x in these two equations.

$(7x - 5) - (4x - 3) = 22$	**$(7x - 5)$** **$\underline{- (4x - 3)}$** **$= 22$**

Unit 2 Lesson 3 – Daily Routines – Fraction Action and *X* Marks the Spot

One per student

Fraction Action

Materiales:
Ningunas

Atrea;

Para la cena, Gary comió $\frac{3}{8}$ de una pizza, and luego comió $\frac{1}{4}$ de la pizza el almuerzo el día siguiente. ¿Qué parte fraccionaria de la pizza sobró después del almuerzo?

X Marks the Spot

Resolver para el valor de *x* en estas dos ecuaciones.

(7*x* – 5) – (4*x* – 3) = 22	**(7*x* – 5)** **– (4*x* – 3)** **= 22**

Literature Selection
Zack Proton and the Wrong Planet
by Brian Anderson
CLASS SET

Materials
- **BLM** 2 Word Association Charts
- CLASSROOM set of literature books
- Bag or box of defective items such as: broken plastic ware, broken toys, broken sticks, flat balls, bottle corks, broken lids, small cylinders or prism with holes, etc. – anything that unless repaired could no longer be used for original purpose – they are DEFECTIVE.
- Masking tape, glue, string
- Scraps of construction paper, wrapping paper, foil, plastic wrap, colorful cardboard
- Box or cylinder or jug
- Spools or other round items
- Markers or crayons
- Supplies for Domino Blast Off Game

Literature Vocabulary
volume
construction
defective
expensive
impossible
Math Vocabulary
ratio
equivalent
rate
unit rate

ELPS *(English Language Proficiency Standards)*
2C, 2J, 3B, 3J, 4F, 5B, 5G

Unit 2, Lesson 3 — Grades 7-8

Classroom Lesson

Every day teachers must post the objectives on the board, read them to the students, and have students read them together with the teacher. At the end of the lesson, teacher and students should review to see if they have accomplished both math and language objectives.

Math Objectives:
- Share dimensional measurements of objects with peers.
- Use any strategy to find equivalent ratios.

Reading Objectives:
- Understand characters by inferring what the author is really trying to say about them.

Language Objectives:
- Use literature vocabulary to create Visual-Verbal Word Associations and share with peers.
- Use literature vocabulary to discuss construction (model) with peers.
- Name equivalent ratios in the domino game.

BEFORE READING
Practice and Application - Vocabulary
Share their Hogzilla posters and their findings from the measurement lab.

Draw students' attention to the literature vocabulary. Are there any words that might be used in connection with Hogzilla? Use as many words as possible in creative sentences, fact or fiction, with regards to Hogzilla. *(Examples: The construction crew worked for five days to build a pen big enough to hold Hogzilla. The volume of Hogzilla's "oink" was so loud; the people in the next town were kept awake at night.)*

Visual – Verbal Word Association Charts
Repeat Lesson 2's Visual-Verbal Word Association activity with the last two literature vocabulary words:
- **expensive**
- **impossible**.

Students should put their charts in their Journals for later reference.

When students are finished, have them share with four people in the room other than those they shared with in Lesson 2. Tell everyone to stand and on the word "TRAVEL," find someone to share their word associations with. After 30 seconds, teacher says "TRAVEL," and they each find someone new to share with. Repeat two more times until everyone has shared four times.

Independent Reading Connection
During independent reading, give students the option of reading ***Zack Proton and the Wrong Planet***, using copies from the set of class books.

Students can reread any part of the book, since you will have finished reading it aloud today. They can also read any of the comic inserts that you skipped during the read aloud.

Listening Center Connection
Have students listen to the interview with the author, Brian Anderson.

Language Center Connection
Have students write a letter to author Brian Anderson that expresses their opinion of the book. Remind students to always remain positive. It's alright to dislike something, but be sure to find several points that are very positive. Encourage them to also mention some of what they learned on the interview.

Have an example of friendly letter format as a reference in the Language Center.

Friendly Letter Format
(Date)

Dear Mr. Anderson,

~~~~~~~~~~~~~~~~~~~~~~~~~~~~
~~~~~~~~~~~~~~~~~~~~~~~~~~~~
~~~~~~~~~~~~~~~~~~~~~~~~

Sincerely,
(student name)

Classroom Lesson - continued

Building Background - Literature
Show students the Genre Chart created in Lesson 1. Remind them that science fiction typically takes place in the future, and the author imagines what the world would be like with science and technology.

Ask students if they think the world Zack Proton lives in will become reality for humans in the future. What aspects of science and technology from the book do they think will be part of our future? What things do they think are impossible? Students should refer to specific parts of the chapter book to support their idea *(provide text evidence)*.

DURING READING
Comprehensible Input – Literature & Vocabulary
You will finish the book today, reading chapters 12 – 14, skipping the "comic" dream inserts which lose something in oral interpretation. If you are doing the timeline or story map activity, place the first one or two major events from the plot.

During the read aloud, the goal is to support students' comprehension of the text by modeling and practicing reading strategies:
- **Analyzing Word Choice: Alliteration**
- **Inferring**

This section indicates places in the text where you can:
- Briefly pause to model a reading strategy by thinking aloud.
- Briefly pause to have students practice a reading strategy by answering a question you pose.

Keep in mind that pausing the reading for too long at any of these places will make the reading very disconnected. This interferes with students' comprehension and enjoyment of the text, so keep the reading as fast-paced as possible.

You may want to mark the following stopping points in the text with sticky notes, indicating what you will say to students.

p. 85 Word Choice: Alliteration
There is an example of alliteration on this page that you can add to the Alphabet Taxonomy chart from Lesson 2:
"panicked planet"

p. 95 Inferring
- Teacher Think Aloud: Here's another example of Zack saying he is heroic, when his actions clearly show that he is being foolish. Again, Omega Chimp is the one who has to get them out of trouble.
~~~~~~~~~~~~~~~~~~~~~~~~

Classroom Lesson - continued

p. 100 Inferring

- Teacher Question: Zack thinks Effie is a true intergalactic hero. What does this tell you about Zack? Talk with your partner.

  Regroup students and have several share with the class. Help students see that Zack is foolish for thinking that Effie is a hero, when he is the one who caused the problem in the first place. Zack is oblivious to reality.

p. 106 Word Choice: Alliteration

There is an example of alliteration on this page that you can add to the Alphabet Taxonomy chart from Lesson 2:
"purple pigs for pets"

p. 107 Inferring

- Teacher Question: Are all three characters heroes? Talk with your partner.

p. 111 Inferring

- Teacher Question: This is an interesting way for the book to end. One alien says that Zack is a very foolish hero. Another alien says that Zack is a very heroic fool. (*Write these two different terms where students can see them.)* What is the difference? Which do you think describes Zack? Talk with your partner.

AFTER READING

Building Background - Vocabulary

Language Experience Approach Activity

Remind students how characters in ***Zack Proton and the Wrong Planet*** used defective items to construct something new. This was a way for them to survive in outer space. Tell students that they will be creating their own CONSTRUCTION using DEFECTIVE items *(point to these words on the word wall as you say them).*

Comprehensible Input - Vocabulary

Show students **YOUR** set of DEFECTIVE ITEMS one by one.

Show students the record sheet they will be using. Carefully review the qualifications for the construction:

- Must have a name and a stated purpose.
- Must be constructed from the "defective" items in their kits.
- Must have a VOLUME control. What does "volume" mean? Have students discuss this before going to next requirement.

Interview

After listening to the interview with Brian Anderson, have students list what they learned from the interview and some questions they would still like to have answered.

Friendly Letter Format

(Date)

Dear Mr. Anderson,

~~~~~~~~~~~~~~~~~~~~~~~~~~~~
~~~~~~~~~~~~~~~~~~~~~~~~~~~~
~~~~~~~~~~~~~~~~~~~~~~~~

Sincerely,
(student name)
~~~~~~~~~~~~~~~~~~~~~~~~

Classroom Lesson - continued

Although students will make only one model, they are to describe the features of two other models that could be offered. The models will represent an EXPENSIVE model, standard model, and economy model. What does "expensive" mean? Discuss before going on in the assignment.

- Students must make a list of things that are possible for their CONSTRUCTION to do; and things that are IMPOSSIBLE for the CONSTRUCTION to do. What does "impossible" mean? Discuss this before continuing the project.

Practice and Application – Vocabulary
Students are given 20-minutes to construct. They are then given a few minutes to complete the record sheet. If time allows, share the constructions now. Otherwise wait until the end of the day for the show and tell.

Transition to Math
Play Domino Blast Off one more time today. During the Follow-up lesson, you will be teaching a similar game for the Family Fun Game using the generic home game board.

Objectives
Review both language and math objectives, making sure students understand how they accomplished each.

Unit 2 Lessons 2, 3 – Classroom Lesson

Print multiple copies for students and have available for use at any time during the summer session.

Vocabulary Building: Visual-Verbal Word Association

Vocabulary Term/Término de vocabulario	**Personal Association/Asociación personal**
Definition/Definición	**Non-Example/No es ejemplo**

Vocabulary Term/Término de vocabulario	**Personal Association/Asociación personal**
Definition/Definición	**Non-Example/No es ejemplo**

Materials
- Child's size 6 jump suit, long sleeves and long legs
- **BLM** Omega Chimp Suit Measurements
- customary ruler (inches)
- pencil and paper
- inch-grid paper
- tape measures
- 4-function calculator
- **BLM** "My 6-inch Spacesuit"

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
volume
construction
defective
expensive
impossible

Teacher Note
Chimpanzee size information:
http://www.kidsplanet.org/factsheets/chimpanzee.html

Human size information:
http://www.cdc.gov/nchs/data/nhanes/growthcharts/set2clinical/cj41l071.pdf

ELPS *(English Language Proficiency Standards)*
2C, 2F, 2J, 3H, 3J, 4D, 4K, 5B, 5G

Unit 2, Lesson 3 — Grades 7-8

Math Lesson

Math Objectives:
- Measure and record the dimensions of a child-sized T-shirt.
- Set up equivalent ratios involving an unknown *x*.
- Work with peers to solve equivalent ratios using any strategy.
- Draw a proportional object on graph paper using appropriate units *(or values)*.

Language Objectives:
- Discuss strategies to set up equivalent ratios involving an unknown *x*.
- Explain problem solving strategies to peers.
- Write measurements with appropriate units.
- Talk about and compare the size *(dimensions)* of different objects.

Building Background
Chimpanzee – Standing approximately 4 feet tall high, males weigh between 90 and 120 pounds while females weigh between 60 and 110 pounds.

Unfortunately, the rays shrank the space suit to just one-inch tall. My question for you today is: what size are all of the other measures on the suit?

Comprehensible Input
Enough about pigs, dwarf or giants!! Let's turn our attention to Omega Chimp today. Because Omega's only space suit was dirty and smelly after landing in the middle of the pigs on Bounceback Planet, Effie created a machine which would clean the suit with UV rays.

An adult chimpanzee is approximately 4 feet tall which is about the same size as an average 6 year old. In children's sizes, the average 6 year old would wear a size 6. I don't have a spacesuit in size 6, but I do have a child's jump suit that size. The book didn't tell us all of the dimensions of the spacesuit, so we're going to use this child size 6 jump suit to find the other shrunken measures.

OK, what do we know about the shrunken suit? *(It is one-inch high.)* Let's assume that measure is from the bottom of the pant leg to the top of the shoulder – one-inch tall. What are some of the other measurements we'll need to know?

Students should follow along and participate in finding the new measurements using the **BLM** Omega Chimp Suit Measurements.

Math Lesson - continued

Set up the ratio of the size 6 jump suit height to width. Then set up the shrunken suit's known height of one-inch to "x" which will be the unknown width.

Technology Option
Students may use a 4-function calculator to save time with calculations.

Talk through finding x by whichever method is most obviously the easiest to use.

Be sure that you ask what "x" represents, and what each of the numbers in the ratios represent. It is important that students keep that understanding in their minds.

Now you have the height and the width of the shrunken suit. Find all of the other shrunken measures in the same fashion.

Tell students that they are going to help one another find their own measures using the **BLM** My 6-inch Space Suit.

Make sure they understand that the measurements are:

height - shoulder to ankle
width – shoulder to shoulder
arm length
length of leg - waist to ankle

They are going to assume that Ellie's machine shrank their individual spacesuits to six-inches tall. Using their own measures, they are to set up ratios that would complete the measures of their shrunken spacesuits. They are then to use the one-inch grid paper and the measures of the shrunken suit to draw their shrunken suit. Decorate as a spacesuit and display.

MAS Space
Tell us what you measured in the Follow-up from Lesson 2 and how many Hogzillas it would take to cover that particular area.

After discussing the MAS Space activity tell them they are going to learn a game in the Follow-up Lesson that they can take home and play with their family. It is similar to the domino game they've been playing, but will be played on the Family Fun Game Board #1they used at home during Unit 1. Show them the game board, dominoes, etc.

Objectives:
Read through the math and language objectives, making sure that students understand how they accomplished each.

Unit 2 Lesson 3 – Math Lesson

One Teacher Transparency
One per student

Omega Chimp's Suit Measurements

Work with your teacher and class to measure Omega Chimp's space suit and calculate (using ratios and proportions) what the shrunken suit measurements will be.

Measures	Omega Chimp's Suit	Shrunken Suit
height		1 inch
width		
length of sleeve		
neck opening		
length of leg from waist		

Unidad 2 Lección 3 – Lección de matemática

Una por estudiante

¡Mi traje espacial de 6 pulgadas!

¡Oh no! ¡Ellie ha encogido TU traje espacial junto con el del chimpancé Omega! Trabaja con un compañero para completar la actividad.

Materiales:

- calculadora de 4 funciones
- cinta métrica
- papel con cuadrícula de una pulgada

Tarea:

1) Trabaja con un compañero para encontrar tus medidas personales.
2) Usa relaciones para encontrar las nuevas medidas de tu traje espacial encogido.
3) Usa papel con cuadrícula de una pulgada para bosquejar los resultados de tu nuevo traje espacial.
4) Decora el traje espacial y exhíbelo en la clase.

Medidas	Medidas personales	Las medidas de tu traje espacial de 6 pulgadas
altura	1 pulgada	
anchura		
longitud de la manga		
abertura para el cuello		
longitud de la pierna desde la cintura		

Compara tu traje espacial encogido con los otros en la clase. ¿Qué notas? Explica por qué esto te sorprende o no.

Materials
- customary ruler (inches)
- pencil and paper
- inch-grid paper
- tape measures
- 4-function calculator
- **BLM** "My 6-inch Spacesuit"
- **BLM** Recursive Review Problems (found in Lesson 1)

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
volume
construction
defective
expensive
impossible

ELPS *(English Language Proficiency Standards)*
2D, 2G, 2J, 3B, 3E, 3H, 4K, 5B, 5G

Technology Option
Students may use a 4-function calculator to save time with calculations.

Unit 2, Lesson 3 — Grades 7-8

Follow-up

Math Objectives:
- Measure and record the dimensions of a child-sized T-shirt.
- Set up equivalent ratios involving an unknown x.
- Work with peers to solve equivalent ratios using any strategy.
- Draw a proportional object on graph paper using appropriate units (or values).

Language Objectives:
- Discuss problem solving strategies with peers.
- Explain our problem solving strategy to peers.
- Talk about the size of their suit and how it compares to the size of their peers'.
- Write about the usefulness of equivalent ratios in comparing size of objects.

Practice and Application
Discuss the assignment with the students to make sure they understand what they are to do. Help students who are bashful about having others help them measure, and make sure the measurement is taken seriously. Ask students whether they think all of their suits will be the same dimensions – after all, they are all beginning with a height of six-inches. Accept all predictions.

As the students work through the assignment, circulate the room to encourage taking the problem seriously, and also to ask clarifying and probing questions. Once completed, students should display the assignment on the walls.

Facilitate a gallery walk. Listen to students as they discuss the various sizes. When the gallery walk is completed, ask students to tell you why the suits were different measures except for the heights.

QUESTIONS
- Explain how you are finding the EQUIVALENT RATIO.
- What did you visualize when you first looked at the problem to estimate a reasonable answer?
- Which method of solving for equivalent ratios do you prefer for these ratio problems? Why?

Recursive Review
- Emilio caught three fish. Each fish was in proportion to the others. The second fish he caught measured 16-inches long and weighed 6 pounds. The first fish he caught weighed 3 pounds. The last fish he caught was 10-inches longer than the second fish he caught. What was the weight and length of each fish?

	Unit 2, Lesson 3 **Grades 7-8** **Follow-up** - continued  --- **Writing Topics** **Independent Writing Topic** Students will have a daily writing activity which will incorporate the day's focus math vocabulary. • How did knowing about equivalent ratios help you solve today's Follow-up problems? **Family Fun Game** Students will take the Family Fun game materials home to teach and play with their families. **Objectives** Review the math and language objectives to make sure that they were accomplished and that the students realize how they were accomplished.

Materials
- 1 cup cherry tomatoes
- 1 cup cheese cubes
- 2 half-cup measuring cups
- 2 paper dessert plates
- 2 paper towels
- copy of grocery receipt for this snack purchase

All items listed above per partner pair
- **BLM** Tomatoes and Cheese-Snack Fractions - 1 per student

Math Objectives
- Use addition, subtraction, multiplication and division to solve problems involving fractions and decimals.
- Convert between fractions, decimals, whole numbers and percents.
- Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios).
- Estimate and find solutions to application problems involving percent.

Language Objectives
- Discuss how ratios and proportions can be used to solve real-world problems.

Math Vocabulary
ratio
equivalent
rate
unit rate

Literature Vocabulary
volume
construction
defective
expensive
impossible

Unit 2, Lesson 3 — Grades 7-8

Snack Fractions

Students should wash their hands before this activity if using food items.

Snack Fractions
Students should have the skills to answer these in small groups. Have the students work through the BLM before sharing the actual snack.

Circulate the room while students are working on the BLM, asking questions as needed to guide, redirect, extend:

QUESTIONS
- How will you find the total yield of these ingredients?
- Explain how to find your fourth.
- How can proportion help you to increase the recipe to serve 20?

Finally, let them share the tomatoes and cheese with a partner.

(*Naturally, if you think the portions suggested in the materials list are too small for a middle schooler's snack, feel free to increase the amounts; make sure, though, that you make the amounts easily divided in halves – they've already done a great deal of work to get the snack.)*

Snack Fraction Journal Writing: BLM Tomatoes and Cheese Snack Fractions
Explain how you determined the amount of ingredients needed for 10 people.

Objectives: Review the objectives with the class, making sure they understand how they achieved each.

Unit 2 Lesson 3 – Snack Fraction

One per student

Tomatoes and Cheese – Snack Fractions

Recipe for Bruschetta with Tomato and Mozzarella

- 2 cups or 2 large tomatoes, chopped fine
- 1/2 red onion, chopped fine
- 1/4 cup fresh basil, chopped
- 2 tablespoons balsamic vinegar
- 2 tablespoons capers
- 4 tablespoons extra virgin olive oil
- salt and pepper to taste
- 1 loaf, French baguette bread
- 2 ounces fresh mozzarella or buratta cheese

What is the proportion of mozzarella to tomatoes? (1 cup is 8 ounces; assume that the weight measure of cheese will approximate the volume measure of 2 ounces.)

If four of you are sharing this snack, what would the volume measure be for your portion? (There are 16 tablespoons in a cup.)

Increase the ingredient amounts to feed 20 people instead of the four for which this recipe is intended.

Using the grocery receipt for the purchase of the Tomato and Cheese snack for the class, what did your portion, shared with one other person, cost?

Unidad 2 Lección 3 – Fracciones de refrigerios 

Una por estudiante

Tomates y queso - Fracciones de refrigerios

Receta para bruschetta con tomate y mozzarella

- 2 tazas o 2 tomates grandes, picados finamente
- 1/2 cebolla roja, picada finamente
- 1/4 taza de albahaca fresca, picada
- 2 cucharadas de vinagre balsámico
- 2 cucharadas de alcaparras
- 4 cucharadas de aceite de oliva extra virgen
- sal y pimienta a gusto
- 1 hogaza, baguette o pan francés
- 2 onzas de mozzarella fresca o queso burrata

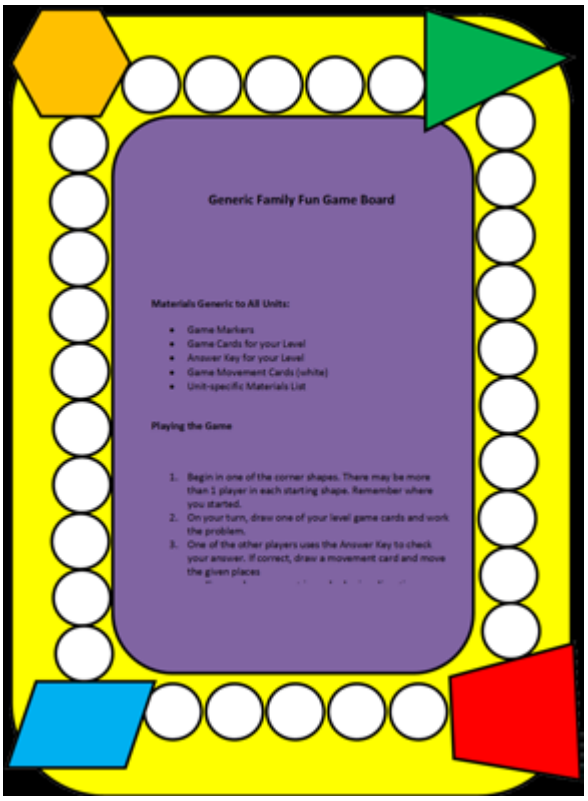
¿Cuál es la proporción de mozzarella a tomates? (1 taza es 8 onzas; considera que la medida de peso de queso se aproximará a la medida de volumen de 2 onzas).

Si comparten este refrigerio entre cuatro, ¿cuál sería la medida de volumen para tu porción? (Hay 16 cucharadas en una taza).

Aumenta las cantidades de los ingredientes para alimentar a 20 personas en lugar de alimentar a las cuatro personas para las que esta receta está pensada.

Utilizando el recibo de la tienda de comestibles por la compra del refrigerio de tomate y queso para la clase, ¿cuánto costó tu porción, compartida con una persona más?

Unit 2 Lesson 3 – Family Fun



Dear _____,

We learned a few more skills today using ratios and proportions!

Here are some strategies I'll need to solve the problems in this unit's game today…

_____

_____

_____

_____

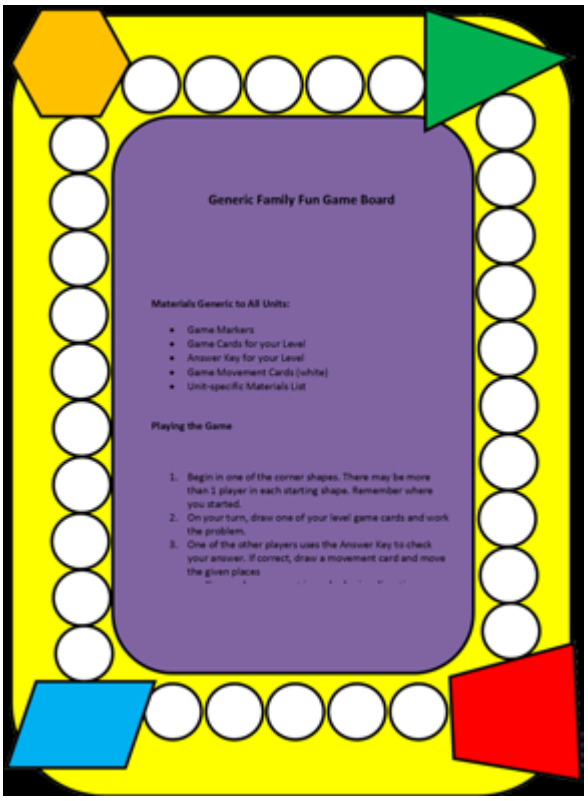
_____

_____

Sincerely,

_____

Unit 2 Lesson 3 – Family Fun



Querido/a_____,

Hoy aprendimos más habilidades usando las razones y proporciones.

Estas son algunas estrategias que necesito para resolver los problemas del juego de hoy…

_____
_____
_____
_____
_____
_____

Atentamente,

_____

This portion of the curriculum is NOT required, but should be used to supplement and enrich the Unit's activities.

Family Fun Suggestion
Share your realistic short story with parents.

Interview someone at home to find what he/she knows about space, the planets, and the stars.

Enrichment Suggestions

Unit 2 ***Zack Proton and the Wrong Planet***

Math Walk
Find and measure a large rectangular area on the campus grounds. Compute the number of dwarf pigs it would take to cover the area.

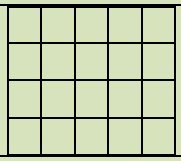
Technology Connection

- More graphing experiences: many lesson plans, some appropriate for home use. http://fcit.usf.edu/math/lessons/lessons8.html
- Cool extension problems to the ratio unit. http://math.rice.edu/~lanius/proportions/

More Curriculum Connection Ideas off the Web

- **Social Studies:** People live for extended periods on the International Space Station. Investigate how life would be different on the space station than it would be living with your family. http://www.nasa.gov/mission_pages/station/main/index.html One of hundreds of sites.
- **Science:** What are some of the modern conveniences that have been invented because of space travel?
  Inventions you probably use:
  http://www.cnn.com/2007/LIVING/worklife/10/04/nasa.everyday/index.html Scholarly on communications:
  http://www.space.com/news/horack_visions_991119.html
  Expanding space travel:
  http://www.nasa.gov/centers/glenn/research/warp/inspinv.html
- **Art:** Create a pig piñata. Save it for the last week Family Gathering!
  http://www.kidspoint.org/columns2.asp?column_id=650&column_type=kpfun

BLM All-School Unit 2, Lesson 3 **Family Fun Game Answer Key**

Problem Letter	Kinder	1-2	3-4	5-6	7-8
A	8 sounds	See Special instructions	7x5=35 5x7=35 35÷7=5 35÷5=7	6 feet	4.78 cm
B	9 dances	See Special instructions	7x6=42 6x7=42 42÷6=7 42÷7=6	5.75 cups dry (or fraction)	550 cm
C	2 people	See Special instructions		48 meters	6 minutes
D	6 people	1 and 9	18 cookies	2760.76 miles	448 miles
E	5 sounds	7 and 3	6 cookies	$73.22	$13.00
F	4 sounds	8 and 2	8 boxes	71.7 oz	21 lbs of apples
G	Top train is longer	1 child	3 sets of 2 counters	$45	588 miles
H	Top train is shorter	29 children	6 sets of 2 counters	$29.37	20 lbs of potatoes
I	3 cubes are fewer than 5	10 cents	Most common would be 2/8, but any equivalent will do.	$750	36 oz of chocolate
J	Nickel	13	3.09	$550	24 oz toffee
K	Dime	9	7.25	$67.44	15 baskets
L	Quarter	14	4 7/10	$12.60	4:5 = 8:10
M	penny	6 cookies	0.9	no. ratios are not set up consistently	$105.00
N	2 pennies	3 miles	0.7	no. scale factor and constant of proportionality not present	9 shirts
O	8 pennies	10 pennies	2.5 > 2.05	4 cupcakes	$5.00
P	2 parts the same size	3 pots	on the middle line	24 hit target	25 oranges
Q	1 parts not the same size	14 pounds	0.9	$\frac{11}{10}$ or an equivalent of	1 hr 30 minutes
R	count to make sure there are 12 counters and use the number 12	1 group of 6 1 groups of 4	Closest line to 1.	$1\frac{1}{3}$	10.5 miles

Generic Family Fun Game Board

Materials Generic to All Units:

- Game Markers
- Game Cards for your Level
- Answer Key for your Level
- Game Movement Cards (white)
- Unit-specific Materials List

Playing the Game

1. Begin in one of the corner shapes. There may be more than one player in each starting shape. Remember where you started.
2. On your turn, draw one of your level game cards and work the problem.
3. One of the other players uses the Answer Key to check your answer. If correct, draw a movement card and move the given places
   - Forward movement in a clockwise direction.
   - Back movement in a counter clockwise direction.

   If incorrect, do not move.
4. Game is over when the first person runs the entire track, ending back on the starting shape.

Tablero de juego

Materiales genéricos para todas las unidades:

- Fichas para jugar
- Tarjetas del juego para su nivel
- Clave de respuestas para su nivel
- Tarjetas de movimiento del juego (blancas)
- Lista de materiales específicos de la unidad

Cómo se juega

1. Empiece en una de las esquinas. Puede haber más de
1 jugador en cada figura de inicio.
2. Cuando sea su turno, saque una de las tarjetas de
juego de su nivel y resuelva el problema.
3. Uno de los otros jugadores usa la clave de respuestas
para ver si su respuesta es correcta. Si es correcta, saque una tarjeta de movimiento y mueva su ficha como lo indica la tarjeta.
   - Movimiento hacia adelante en el sentido de las manecillas del reloj.
   - Movimiento hacia atrás en el sentido contrario a las manecillas del reloj.

   Si es incorrecta, no se mueve.
4. El juego se acaba cuando la primera persona recorre
toda la pista y termina en la figura de inicio.

Units 2 Lesson 3 – FAMILY FUN

One per student for home
One per partner pair in class

*Print on **goldenrod** paper.*

Family Fun – Problem Cards (1 of 2)

A. It is 478 cm from my desk to the door. How many meters is it from my desk to the door?	**B**. There are 100 cm to 1 meter. How many cm are there in 5.5 meters?	**C**. Angela can run 3.5 blocks in 2 minutes. How long would it take at that speed to run 10.5 blocks?
D. Al's car can average 28 miles per 1 gallon of gas. At that rate, how far can Al drive on 16 gallons of gas?	**E**. Sonja's scooter goes 48 miles on 1 gallon of gas. If a gallon of gas costs $3.25, how much will it cost her to drive 192 miles?	**F**. If it takes 6 pounds of apples to make 4 apple pies, how many pounds of apples would it take to make 14 apple pies?
G. Al's car can average 28 miles per 1 gallon of gas. At that rate, how far can Al drive on 21gallons of gas?	**H**. If it takes 8 pounds of potatoes to make 6 shepherd's pies, how many pounds of potatoes would it take to make 15 shepherd's pies?	**I**. A recipe feeding 20 people calls for 24 ounces of chocolate. How much chocolate is needed to make a recipe to feed 30 people?

Unidad 2, Lección 3 – DIVERSIÓN FAMILIAR

Una por estudiante por hogar
Una por pareja de compañeros en clase
*Imprimir en papel **vara de oro**.*

Diversión familiar – Cartas de problemas (1 de 2)

A. Hay 478 cm desde mi escritorio hasta la puerta. ¿Cuántos metros hay desde mi escritorio hasta la puerta?	**B**. Un metro tiene 100 cm. ¿Cuántos cm hay en 5.5 metros?	**C**. Angela puede correr 3.5 manzanas en 2 minutos. ¿Cuánto tardará, a esa velocidad, en correr 10.5 manzanas?
D. El auto de Al puede hacer en promedio 28 millas por 1 galón de gas. A esa tasa, ¿cuánto puede conducir Al con 16 galones de gas?	**E**. El scooter de Sonja recorre 48 millas con 1 galón de gas. Si un galón de gas cuesta $3.25, ¿cuánto le costará a Sonja recorrer 192 millas?	**F**. Si se necesitan 6 libras de manzanas para hacer 4 pasteles de manzana, ¿cuántas libras de manzanas se necesitarán para hacer 14 pasteles de manzana?
G. El auto de Al puede hacer en promedio 28 millas por 1 galón de gas. A esa tasa, ¿cuánto puede conducir Al con 21 galones de gas?	**H**. Si se necesitan 8 libras de patatas para hacer 6 shepherd's pies, ¿cuántas libras de patatas se necesitarán para hacer 15 shepherd's pies?	**I**. Una receta que rinde para 20 personas lleva 24 onzas de chocolate. ¿Cuánto chocolate se necesita para hacer que la receta rinda para 30 personas?

Units 2 Lesson 3 – FAMILY FUN

One per student for home
One per partner pair in class

*Print on **goldenrod** paper.*

Family Fun – Problem Cards (2 of 2)

J. A recipe feeding 24 people calls for 16 ounces of toffee. How much toffee is needed to make a recipe to feed 36 people?	**K**. If a player's free-throw average is 6:10, how many baskets would be expected from 25 throws?	**L**. If one player's free-throw average is 4:5, and another's is 8:10, which player has the better average?
M. T-shirts are on sale 3 for $15. At that price, what would 21 t-shirts cost?	**N**. T-shirts are on sale 3 for $15. At that price, how many shirts could be bought with $45?	**O**. Oranges sell 5 for $1.25. At that price, what would 20 oranges cost?
P. Oranges sell 5 for $1.25. At that price, how many oranges could be bought with $5?	**Q.** Frankie can run 5 miles in 1 hour. At that speed, how long will it take her to run 7.5 miles?	**R.** Justin can run 7 miles in 1 hour. At that speed, how many miles can he run in an hour and a half?

J. Una receta que rinde para 24 personas lleva 16 onzas de caramelo. ¿Cuánto caramelo se necesita para hacer que la receta rinda para 36 personas?	**K**. Si el promedio en tiros libres de un jugador es de 6:10, ¿cuántas canastas se esperarían de 25 tiros?	**L**. Si el promedio en tiros libres de un jugador es 4:5 y el de otro es 8:10, ¿cuál jugador tiene el mejor promedio?
M. Las camisetas están en oferta de 3 por $15. A ese precio, ¿cuánto costarían 21 camisetas?	**N**. Las camisetas están en oferta de 3 por $15. A ese precio, ¿cuántas camisetas se podrían comprar con $45?	**O**. Se venden 5 naranjas por $1.25. A ese precio, ¿cuánto costarían 20 naranjas?
P. Se venden 5 naranjas por $1.25. A ese precio, ¿cuántas naranjas se podrían comprar con $5?	**Q.** Frankie puede correr 5 millas en 1 hora. A esa velocidad, ¿cuánto tardará en correr 7.5 millas?	**R.** Justin puede correr 7 millas en 1 hora. A esa velocidad, ¿cuántas millas puede correr en una hora y media?

Unit 2 Lesson 3 – FAMILY FUN

Special 7th – 8th Game Instructions

Materials:

- Family Fun Generic Game Board
- Family Fun Movement Cards
- Unit 2 Family Fun Problem Cards (green)
- Family Fun Answer Key from Unit 1 (all grade bands)
- Unit 2 Family Fun Special 7th – 8th Game Instructions

Solution Expectations

Problems A – R

All of the problems are asking students to find equivalent ratios, but the situations are quite different. It is important for students to understand that even though the context of the problem situations vary between ratios of people and things, price, and rates, solving them is essentially the same.

The numbers chosen for these problems are compatible and shouldn't need laborious efforts to calculate. Simple number sense and relationships should allow students to calculate the answer mentally or with very little work.

Example:

T-shirts are on sale 5 for $12. At that price, what would 30 t-shirts cost?

Students need to keep track of their units/labels when writing the ratio in fraction form.

$$\frac{\textbf{5 shirts}}{\textbf{\$12}} = \frac{\textbf{30 shirts}}{\textbf{\$ } x}$$

Solution Strategy: I know to get from 5 shirts to 30 shirts I have to multiply by 6. In other words, I have 6 groups of 5 shirts. If each group of 5 shirts costs $12, then 6 groups of $12 will equal $72. Basically, you take the ratio of 5:12 and multiply the numerator and denominator by 6 to find your answer.

Unidad 2, Lección 3 – DIVERSIÓN FAMILIAR

Instrucciones especiales de juego para 7º – 8º

Materiales:

- Tablero de juego genérico de Diversión Familiar
- Cartas de movimiento de Diversión Familiar
- Cartas de problemas de Diversión Familiar de la Unidad 2 (verdes)
- Guía de respuestas de Diversión Familiar para la Unidad 1 (todos los grados)
- Instrucciones especiales de juego de Diversión Familiar Unidad 2 para 7º – 8º

Expectativas de solución

Problemas A – R

Todos los problemas piden a los estudiantes que encuentren relaciones equivalentes, pero las situaciones son muy diferentes. Es importante que los estudiantes entiendan que aun cuando el contexto de las situaciones de los problemas varíe entre relaciones de personas y cosas, precios y tasas, el modo de resolverlos es esencialmente el mismo.

Los números elegidos para estos problemas son compatibles y los cálculos no deben ser laboriosos. Un simple sentido de los números y las relaciones debe permitir a los estudiantes calcular la respuesta mentalmente o con muy poco trabajo.

Ejemplo:

Las camisetas están en oferta de 5 por $12. A ese precio, ¿cuánto costarían 30 camisetas?

Los estudiantes deben estar al tanto de sus unidades/etiquetas al escribir la relación en forma de fracción.

$$\frac{5 \text{ shirts}}{\$12} = \frac{30 \text{ shirts}}{\$ \text{ x}}$$

Estrategia de Solución: Sé que para ir de 5 camisetas a 30 camisetas tengo que multiplicar por 6. En otras palabras, tengo 6 grupos de 5 camisetas. Si cada grupo de 5 camisetas cuesta $12, entonces 6 grupos de $12 equivaldrán a $72. Básicamente, tomas la relación de 5:12 y multiplicas el numerador y el denominador por 6 para encontrar la respuesta.

Math Matters 2014 – In-Home Instruction

Math Objectives

Math Lesson 1

- Use grid paper to measure length and width of rectangles
- Calculate area of rectangles
- Compare areas (equivalent ratios) using visual representations, patterns and cross multiplication for equivalent ratios.

Math Lesson 3

- Write rates as ratios with proper labels.
- Compare rates with unit rates and serving costs.
- Use patterns to find equivalent ratios.
- Use cross multiplication to solve for an unknown.

Differentiate

Math Lesson 1 – students use area to find proportional ratio using three different strategies (visual representations, patterns and relationships, cross multiplication).

Math Lesson 3 – students help each other find their own measurements per the handout, then find the ratio of their measurements to a jump suit 1" tall.

Materials

Math Lesson 1

- Math Lesson vocabulary cards
- **BLM** Piggy Spaces cut-outs with border
- **BLM** Piggy Spaces-Practice Problems
- customary ruler
- tape (to tape down pigs)
- scissors

Math Lesson 3

- Child's size 6 jump suit, long sleeves and long legs (1 for teacher to use as model)
- **BLM** Omega Chimp Suit Measurements
- customary ruler (inches)
- pencil and paper
- inch-grid paper
- tape measures
- 4-function calculator
- **BLM** "My 6-inch Spacesuit"

Family Fun

- Family Fun Generic Game Board
- Family Fun Movement Cards
- Unit 2 Family Fun-Problem Cards
- Family Fun Answer Key from Unit 1 (all grade bands)
- Unit 2 Family Fun Special 7^{th} – 8^{th} Game Instructions
- Game markers
- 4-function calculator

Snack Fractions (Math Lesson 1)

- 1 cup guacamole or other dip
- 6 carrots (small)
- 2 half-cup measuring cups
- 2 plastic spoons
- 2 paper dessert plates
- 2 paper towels
  All items listed above per partner pair
- **BLM** Dip 'n Veggies-Snack Fractions

Snack Fraction Notice All snack fractions are common throughout the grade bands. All grade bands have daily snack fraction activities provided. All snack fractions for a unit in a specific grade band will practice the same set of skills. Therefore, you may choose from any of the three activities. **Lesson 1** has been suggested for this Unit in all grade bands for its ease of delivery.	

QUESTIONING
As a result of this lesson, your students should be able to respond to the following:

- What is a ratio?
- Explain one method for finding equivalent ratios
- Explain how visualization can help you find equivalent ratios.
- Which method of solving for equivalent ratios do you prefer? Why?
- Does the type of problem and the ratios involved make any difference in the type of strategy you would use? Explain.

Math Vocabulary
ratio, equivalent, rate, unit rate

CGI Problem

- rates
- prices

Journal Writing
Explain what equivalent ratios are.

Family Fun
A generic game board is being used in all grade levels, differentiated by game cards specific to the grade level.

Snack Fractions
Students divide their snack into fourths, find ratios between ingredients, calculate cost per portion, and increase recipe to 10 servings.

Assessment
Students will be introduced to and practice skills for items 1, 4, 5, 7.

Grades 7-8 Overview

Unit 3, Lesson 1 *Where the Sidewalk Ends*

This is a quick snapshot of each of the three math lessons for this unit. For detailed instructions, balanced literacy objectives and enrichment ideas, refer to the complete lesson plans for each lesson. **NOTE: BLMs are per student unless otherwise indicated.**

Lesson Segment	Math Objectives	Language Objectives	Activity	Manipulatives	Supplies
Daily Routine 30 – 45 minutes	Solve word problems using a variety of strategies and defend their strategies. Model and solve 3-step word problems. Compose and decompose values to show a new representation of the value. Find equivalent fractions.	Speak to partners, teacher, and class using vocabulary. Discuss problem solving process and strategies. Explain how they decided to rename the target number.	**Essential:** • Measurement Lab • Solve It! Problems • Fraction Action • *X* Marks the Spot • CGI **Optional:** • Target Number 25 • Graphing • Money Matters (on MAS Space)	• ruler • Money Kit: 1 dollar bill, 2 quarters, 3 dimes, 4 nickels, 5 pennies	• **BLM** Money Lengths-Measurement Lab Record Sheet • plain white copy paper • crayons • **BLM** Solve It! Problems 1-3 • **BLM** Fraction Action and *X* Marks the Spot • **BLM** Lessons 1-3 CGI ***Where the Sidewalk Ends***
Classroom Lesson 30 min. – 1 hour	Determine the comparison value of a set of coins based on diameter of coin rather than face value. Compare student-generated measurements.	Define words using context clues, then verify with dictionaries. Recognize and use synonyms. Create a Synonym Story Poster. Discuss the poet's purpose in writing the poem.	**Vocabulary** Create synonym posters from vocabulary words. **Literature** Listen to another poem to better understand Shel Silverstein; listen to SMART for today's vocabulary and to compare to previous poem. **Transition to Math** Continue working on Measurement Lab activity from Daily Routines.		• Vocabulary Synonym Story Sample Poster
Math Lesson 30 minutes	Find ratio of single coin value to a dollar. Find fraction and decimal representation of single coin value out of a dollar. Find percent of coin value of a dollar.	Listen and follow directions. Verbalize strategies and justify your actions.	**Vocabulary** Use vocabulary pervasively in the lesson, including literature vocabulary (see suggestions in side bar of lesson).		• **BLM** Fractions, Decimals, Percents

	Compare the amount the SMART son had to a dollar and find the percent of a dollar for each swap. Find the percent of money missing from the dollar for each swap.		**Mathematics** Use what they found in the Daily Routine Measurement Lab to find percent of . . .		
Follow-up Lesson 30 min. – 1 hour *(including Snack Fractions)*	Find ratio of single coin value to a dollar. Find fraction and decimal representation of single coin value out of a dollar. Find percent of coin value of a dollar. Compare the amount the SMART son had to a dollar and find the percent of a dollar for each swap. Find the percent of money missing from the dollar for each swap.	Listen and follow directions. Verbalize strategies and justify your actions. Explain problem solving strategy to peers. Explain how finding unit rates can be helpful for you and your family.	Continue the lesson, modeling another problem before circulating the room to assure students understand the problems and how to set up ratios. **Writing Prompt** Explain why finding hundredths can be helpful in representing percents.		• **BLM** Recursive Review Problems Lessons 1-3
Snack Fractions	Use addition, subtraction, multiplication and division to solve problems involving fractions and decimals. Convert between fractions, decimals, whole numbers and percents. Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios). Estimate and find solutions to application problems involving percent.	Discuss how ratios and proportions can be used to solve real-world problems	Students will work in pairs and explore fraction, decimal, and percent concepts through fair-sharing dill pickles.	• 1 dill pickle • 2 paper dessert plates • 2 paper towels • 1 plastic knife *All items listed above per partner pair*	• **BLM** Dill Pickle-Snack Fractions

Grades 7-8 Overview

Unit 3, Lesson 2 *Where the Sidewalk Ends*

This is a quick snapshot of each of the three math lessons for this unit. For detailed instructions, balanced literacy objectives and enrichment ideas, refer to the complete lesson plans for each lesson.

Lesson Segment	Math Objectives	Language Objectives	Activity	Manipulatives	Supplies
Daily Routine 30 – 45 minutes	Solve word problems using a variety of strategies and defend their strategies. Model and solve 3-step word problems. Compose and decompose values to show a new representation of the value. Find equivalent fractions.	Speak to partners, teacher, and class using vocabulary. Discuss problem solving process and strategies. Explain how they decided to rename the target number.	**Essential:** • Measurement Lab • Solve It! Problems • Fraction Action • *X* Marks the Spot • CGI **Optional:** • Target Number 50 • Graphing • Money Matters	• large box (at least 24”x24”x18”) • assorted broken objects (enough to fill about 1/4 of the box during the activity) • tape measures	• **BLM** Collector’s Box-Measurement Lab Record Sheet • **BLM** Solve It! Problem 3 • **BLM** Fraction Action and *X* Marks the Spot • **BLM** Lessons 1-3 CGI ***Where the Sidewalk Ends***
Classroom Lesson 30 min. – 1 hour	Understand the concept of discounts.	Learn and use vocabulary words for this unit. Describe a collection. Write a paragraph about a real or imaginary collection. Listen to a reading and predict. Read to understand the author’s purpose in writing the poem.	**Vocabulary** Continue building vocabulary through lesson. **Literature** Read to find the things the Collector might be able to repair and sell, if he wanted. **Transition to Math** Students discuss discounted prices and percentages in reference to the class collection box.		• BLM Store Circular 2 per student)

Math Lesson 30 minutes	Find the amount saved when you know the percent of discount and the retail price. Find percent of discount when you know the retail price and sales price. Find sales price when you know the retail price and the percent of discount. Find the retail price when you know the percent of discount and the sales price.	Discuss the various ways to find discount. Share ideas with students in your group. Explain how to use the discount rectangle to solve discount problems.	**Vocabulary** Use vocabulary pervasively in the lesson, including literature vocabulary (see suggestions in side bar of lesson). **Mathematics** Students learn how to utilize the bar model and formula for discounted percentages.	• 4-function calculator (optional)	• **BLM** Repaired Items for Sale Problems 1-4
Follow-up Lesson 30 min. – 1 hour *(including Snack Fractions)*	Find the amount saved when you know the percent of discount and the retail price. Find percent of discount when you know the retail price and sales price. Find sales price when you know the retail price and the percent of discount. Find the retail price when you know the percent of discount and the sales price.	Discuss the various ways to find discount. Share ideas with students in your group. Explain how to use the rectangular bar model to solve discount problems.	Continue the lesson, modeling another problem before circulating the room to assure students understand the problems and how to set up ratios. **Writing Prompt** Explain how the bar model helps you solve percent problems.	**BLM** Store Circular Problems 1-2	• **BLM** Store Circular Problems 1-2
Snack Fractions	Use addition, subtraction, multiplication and division to solve problems involving fractions and decimals. Convert between fractions, decimals, whole numbers and percents. Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios). Estimate and find solutions to application problems involving percent.	Discuss how ratios and proportions can be used to solve real-world problems	Students will work in pairs and explore fraction, decimal, and percent concepts through fair-sharing veggies and dip.	• 2 paper dessert plates • 2 paper towels • cm ruler • 6 pieces of beef jerky *All items above per partner pair*	• **BLM** Beef Jerky-Snack Fractions

Grades 7-8 Overview

Unit 3, Lesson 3 *Where the Sidewalk Ends*

This is a quick snapshot of each of the three math lessons for this unit. For detailed instructions, balanced literacy objectives and enrichment ideas, refer to the complete lesson plans for each lesson.

Lesson Segment	Math Objectives	Language Objectives	Activity	Manipulatives	Supplies
Daily Routine 30 – 45 minutes	Solve word problems using a variety of strategies and defend their strategies. Model and solve 3-step word problems. Compose and decompose values to show a new representation of the value. Find equivalent fractions.	Speak to partners, teacher, and class using vocabulary. Discuss problem solving process and strategies. Explain how they decided to rename the target number.	**Essential:** • Measurement Lab • Solve It! Problems • Fraction Action • *X* Marks the Spot • CGI **Optional:** • Target Number 75 • Graphing • Money Matters		• **BLM** Solve It! Problem 4-5 • **BLM** Fraction Action and *X* Marks the Spot • **BLM** Lessons 1-3 CGI ***Where the Sidewalk Ends***
Classroom Lesson 30 min. – 1 hour	Solve percent problems in a game format.	**Reading Objectives:** • Compare fact and fiction. • Infer the meaning of a poem and the author's purpose. **Language Objectives**: • Identify synonyms to increase vocabulary. • Use different word wall words to talk about the literature you've read so far.	**Vocabulary** Continue building vocabulary through lesson. **Literature** Read the poem and discuss the varying amounts paid. Discuss the author's purpose in writing a poem like this. **Transition to Math** Students play Family Fun Game (omit cards involving finding tips).	• 4-function calculator	• Where the Sidewalk Ends (class set or copy of poem: "The Gypsies are Coming) • Vocabulary cards • Word Wall map • Pictures of real gypsies http://photobucket.com/images/gypsies/ • Family Fun Generic Game Board • Family Fun Movement cards • Unit 3 Family Fun-Problem Cards • Family Fun Answer Key from Unit 1 (all grade bands) • Unit 2 Family Fun Special 7^{th} – 8^{th} Game Instructions • Game markers

Math Lesson 30 minutes	Calculate tips.	Discuss tipping and how to use percent to calculate tips.	**Vocabulary** Use vocabulary pervasively in the lesson, including literature vocabulary (see suggestions in side bar of lesson). **Mathematics** Use money amounts in poem to calculate tips.	• 4-function calculators	• **BLM** Tipping to Save
Follow-up Lesson 30 min. – 1 hour *(including Snack Fractions)*	Solve problems involving calculating tips.	Discuss problem solving strategies with peers. Explain your problem solving strategy to peers.	Continue the lesson, modeling another problem before circulating the room to assure students understand the problems and how to set up ratios. **Writing Prompt** Explain how to calculate a tip.	• 4-function calculator	• Family Fun Generic Game Board • Family Fun Movement cards • Unit 3 Family Fun-Problem Cards • Family Fun Answer Key from Unit 1 (all grade bands) • Unit 3 Family Fun Special 7^{th} – 8^{th} Game Instructions • Game markers • **BLM** Recursive Review Problems Lessons 1-3
Snack Fractions	Use addition, subtraction, multiplication and division to solve problems involving fractions and decimals. Convert between fractions, decimals, whole numbers and percents. Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios). Estimate and find solutions to application problems involving percent.	Discuss how ratios and proportions can be used to solve real-world problems.	Students will work in pairs and explore fraction, decimal, and percent concepts through fair-sharing veggies and dip.	• 2 pieces of raisin bread • 1 banana • 2 paper dessert plates • 2 paper towels • 1 plastic knife *All items above per partner pair*	• **BLM** Raisin Bread and Bananas-Snack Fractions

Project SMART/Math MATTERS 2014

Grade Level: 7-8	Unit 3 / Lessons 1 – 2 – 3

Daily Routine Math Objectives:
Measure to find length.
Solve multistep word problems
Solve situational problems involving fractions using pictures, numbers, and words.
Solve for *x*.
Practice basic facts.

Daily Routine Language Objectives:
Listen, read, speak, and write the problem.
Listen to, read, speak and write about measurement vocabulary.
Speak to partners, teacher, and class using vocabulary introduced in the Daily Routines.

Unit Math Objectives:
Find ratio of single coin value to a dollar.
Find fraction and decimal representation of single coin value out of a dollar.
Find percent of coin value of a dollar.
Compare the amount the SMART son had to a dollar and find the percent of a dollar for each swap.
Find the percent of money missing from the dollar for each swap.
Find the amount saved when you know the percent of discount and the retail price.
Find percent of discount when you know the retail price and sales price.
Find sales prices when you know the retail price and the percent of discount.
Find the retail price when you know the percent of discount and the sales price.
Calculate tip.

Unit Language Objectives:
Discuss the various ways to find discount.
Share ideas with students in your groups.
Explain how to use the discount rectangle to solve discount problems.
Explain how to calculate tip.
Explain how to find "percent of."

Technology Objectives:
Use research skills and electronic communication, with appropriate supervision, to create new knowledge.

Vocabulary
Math: ratio, equivalent, rate, unit rate, percent of, discount, tip
Language: swapped, traded, collector, gypsy, gypsies

Resources/Literacy Links
"Smart," "Hector the Collector," "The Gypsies Are Coming" from ***Where the Sidewalk Ends***
by Shel Silverstein

Lesson Sequence

- Daily Routine: 30 – 45 minutes
- Classroom Lesson: 30 minutes - 1 hour
- Math Lesson: 30 minutes
- Classroom Follow-up including Independent Writing: 30 minutes - 1 hour

Enrichment Activities – These are BEYOND EXPECTATION

Math Extensions:

Math Walk: Looking for objects appropriate for Hector the Collector's box.
Interactive Game with decimals:
http://www.quia.com/rr/31090.html
http://www.gamequarium.com/decimals.html
http://www.decimalsquares.com/dsGames/
Simple to challenging games with decimals:
http://www.toonuniversity.com/flash.asp?err=198
Football theme decimals and fractions:
http://www.funbrain.com/football/
More graphing experiences: Many lesson plans, some appropriate for home use.
http://fcit.usf.edu/math/lessons/lessons8.html
Cool extension problems to the ratio unit:
http://math.rice.edu/~lanius/proportions/

Strand Extensions:

- **Social Studies:** Research coins. Select one of the following questions and create a poem or poster to share your research. When did coins begin to be used? What civilization is credited for their beginning? How have coins in the USA changed since 1776?
  http://www.usmint.gov/kids/
  http://www.livescience.com/2058-profound-history-coins.html
  http://www.ancienthistory.com/history.shtml
- **Science:** Did you know that there is a science to collecting? Check out the University of Oxford to find out about it. http://www.ox.ac.uk/media/science_blog/080610_1.html
- **Art:** Check out these cool artworks made from junk! Then make your own work of art from things others would throw away.
  http://www.noupe.com/inspiration/40-terrific-works-of-art-made-from-common-trash.html

Technology:

More Balanced Literacy:
http://t4.jordan.k12.ut.us/Balanced_Literacy/reading_components.htm
Graphic organizers: http://instech.tusd.k12.az.us/balancedlit/handbook/BLMS/blgo.htm
Family Math: http://illuminations.nctm.org/swr/review.asp?SWR=439
Article from PBS on starting a Family Math Night:
http://www.pbs.org/teachersource/whats_new/math/tips0899.shtm
Parent Connection: Lists of games and activities for the family using a ball in a sock.
http://www.funattic.com/game_flingsock.htm#anchor349698

Materials

- **BLM** Money Lengths-Measurement Lab Record Sheet
- **BLM** Solve It! Problems 1-3
- **BLM** Fraction Action and *X* Marks the Spot
- **BLM** Lessons 1-3 CGI ***Where the Sidewalk Ends***

Math Objectives

- Solve word problems using a variety of strategies and defend their strategies.
- Model and solve 3-step word problems.
- Compose and decompose values to show a new representation of the value.
- Find equivalent fractions.

Language Objectives

- Speak to partners, teacher, and class using vocabulary.
- Discuss problem solving process and strategies. Explain how they decided to rename the target number.

Math Vocabulary

ratio
equivalent
rate
unit rate
percent of
discount
tip

Literature Vocabulary

swapped
traded
collector
gypsy
gypsies

ELPS (English Language Proficiency Standards - TX)
2C, 2D, 2E, 2I, 3D, 3E, 4F, 5G

TEKS for this Unit

7^{th} – 7.2,D; 7.3A;
8^{th} -8.2AB; 8.3B, 8.5A

Unit 3, Lesson 1 Grades 7-8

Daily Routine

The following daily activities will help prepare your students for the Post-assessment. They are not optional.

ESSENTIAL

Measurement Lab

- **Lesson 1 – length**
- Lesson 2 – capacity
- Lesson 3 – *omit*

Lesson 1 Materials

- ruler
- plain white copy paper
- crayons or markers
- Money Kit: 1 dollar bill, 2 quarters, 3 dimes, 4 nickels, 5 pennies

Lesson 1 Student Groups

1) Trace bill in upper left corner of construction paper.
2) Do a crayon rubbing of each coin next to the dollar bill.
3) Measure bill to the nearest inch, label with measurement
4) Measure coin collections to the nearest inch, label with measurements
5) Compare coin group measurements and discuss any observations gathered about their diameters.

Solve It! Multi-step problem solving

- **Lesson 1 – threes, related problems**
- Lesson 2 – pairs, 3-step problem
- Lesson 3 – pairs, 3-step problem

Fraction Action

- **Lesson 1 – BLM Fraction Action and X Marks the Spot**
- Lesson 2 – BLM Fraction Action and X Marks the Spot
- Lesson 3 – BLM Fraction Action and X Marks the Spot

***X* Marks the Spot**

- **Lesson 1 – BLM Fraction Action and X Marks the Spot**
- Lesson 2 – BLM Fraction Action and X Marks the Spot
- Lesson 3 – BLM Fraction Action and X Marks the Spot

CGI

- **Lesson 1 – rate, measurement division**
- Lesson 2 – rate, multiplication (assessment item 7)
- Lesson 3 – price, partitive (assessment item 6)

Unit 3, Lesson 1 — Grades 7-8

Daily Routine - continued

The following activities, although certainly developmentally appropriate for your 7th and 8th grade students, do not specifically address objectives assessed on the Post-assessment. Schools with shorter teaching spans can consider omitting some or all these activities as your time permits.

OPTIONAL

Target Number

- **Lesson 1 – Target Number 25**
- Lesson 2 – Target Number 50
- Lesson 3 – Target Number 75

Money Matters

(*If you have a full program and wish to use this optional activity, you will find BLMs and Explanations in the Optional Activities Tab of your Teacher's Guide*.)

Technology Option

The educreations iPad app lets you turn your iPad into a mini white board.

Assessment Items

Students are introduced to and practice the skills necessary for success on the following assessment items: 1, 2, 3, 6, 9

TEKS for this Unit

Unit 3 Lesson 1 – Daily Routines - Measurement Lab

One per student

Coin Measures – Measurement Lab Record Sheet

Students should work in small groups.

Materials:

- ruler
- plain white copy paper
- crayons or markers
- Money Kit: 1 dollar bill, 2 quarters, 3 dimes, 4 nickels, 5 pennies

Task:

1) Trace bill in upper left corner of copy paper.

2) Do a crayon rubbing of each coin next to your dollar bill drawing.

    a. place coin (heads up) underneath paper in desired position
    b. rub crayon over coin gently until its image appears on the paper
    c. label coin rubbing with appropriate name and value
    d. repeat process for each coin

3) Measure bill to the nearest inch, label drawing with measurement.

4) Measure coin collections to the nearest inch, label drawings with measurements

    a. lay two quarters side-by-side underneath the dollar drawing
    b. trace around both coins
    c. measure distance from the start of the first quarter to the end of the second quarter, label measurement
    d. repeat process for remaining coin groups using the specified number of coins within each group.

5) Compare coin group measurements and discuss any observations you gather from their diameters.

Keep your coin poster. You will revisit this activity later in the lesson.

Unidad 3 Lección 1 – Rutinas diarias - Laboratorio de medición

Una por estudiante

Medidas de monedas - Hoja de registro del laboratorio de medición

Los estudiantes deben trabajar en grupos pequeños.

Materiales:

- regla
- papel de copia blanco
- crayones o marcadores
- Kit de dinero: 1 billete de un dólar, 2 monedas de 25 centavos, 3 monedas de 10 centavos, 4 monedas de 5 centavos, 5 centavos

Tarea:

1) Calca el billete en la esquina superior izquierda del papel de copia.

2) Calca cada moneda con crayón al lado del dibujo del billete de un dólar.

    a) coloca las monedas (las caras hacia arriba) debajo del papel en la posición deseada;
    b) pinta con el crayón encima de la moneda con suavidad, hasta que la imagen aparezca en el papel;
    c) etiqueta el dibujo de la moneda con el nombre y el valor apropiados;
    d) repite el proceso para cada moneda.

3) Mide el billete a la pulgada más cercana, etiqueta el dibujo con la medida.

4) Mide la colección de monedas a la pulgada más cercana, etiqueta los dibujos con las medidas.

    a) coloca dos monedas de 25 centavos lado a lado debajo del dibujo de un dólar;
    b) traza el contorno de ambas monedas;
    c) mide la distancia desde el comienzo de la primera moneda de 25 centavos hasta el extremo de la segunda moneda de 25 centavos, etiqueta la medida;
    d) repite el proceso para los grupos de monedas restantes usando el número especificado de monedas dentro de cada grupo.

5) Compara las medidas de los grupos de monedas y habla sobre cualquier observación que puedas reunir de sus diámetros.

Conserva tu póster de monedas. Más adelante en la lección, volverás a esta actividad.

Unit 3 Lesson 1 – Daily Routines - Solve It! Problems (Group of Three)

One per student

Partner #1 - Problem 1:

Lupita is planning a brunch party for 36 people. She wants to serve each guest two sausage croissants. If she bakes one sausage inside each croissant, how many sausages does she need to purchase?

Partner #2 - Problem 2:

The sausages come in packages of 8. Lupita bought just the right number of packages to allow for two servings per guest. How many packages did she buy?

- What do you need from Problem 1 to solve Problem 2?
- Be sure to verify the answer to Problem 1 before solving Problem 2.
- What is the answer to the question? Show your solution strategy.

Partner #3 - Problem 3:

Lupita always buys good quality food even when the price is higher. The sausages she bought were $7.49 per package. What was the total price she paid for the sausages (excluding tax)?

- What do you need from Problem 1 to solve Problem 2?
- Be sure to verify the answer to Problem 1 before solving Problem 2.
- What is the answer to the question? Show your solution strategy.

Unidad 3 Lección 1 – Rutinas diarias – ¡Resuélvelo! Problemas (Grupo de 3) 

Una por estudiante

Compañero # 1 - Problema 1:
Lupita está planificando una fiesta con brunch (desayuno-almuerzo) para 36 personas. A cada invitado le quiere servir dos cruasanes con salchicha. Si hornea una salchicha dentro de cada cruasán, ¿cuántas salchichas necesita comprar?

Compañero # 2 - Problema 2:
Las salchichas vienen en paquetes de 8. Lupita tan solo compró el número exacto de paquetes para servir dos porciones por invitado. ¿Cuántos paquetes compró?

- ¿Qué necesitas del problema 1 para resolver el problema 2?
- Asegúrate de verificar la respuesta del problema 1 antes de resolver el problema 2.
- ¿Cuál es la respuesta a la pregunta? Muestra tu estrategia de solución.

Compañero # 3 - Problema 3:
Lupita siempre compra alimentos de buena calidad, incluso cuando el precio es mayor. Las salchichas que compró costaban $7.49 por paquete. ¿Cuál fue el precio total que pagó por las salchichas (sin incluir impuestos)?

- ¿Qué necesitas del problema 1 para resolver el problema 2?
- Asegúrate de verificar la respuesta del problema 1 antes de resolver el problema 2.
- ¿Cuál es la respuesta a la pregunta? Muestra tu estrategia de solución.

Unit 3 Lesson 1 – Daily Routines – Fraction Action and *X* Marks the Spot

One per student

Fraction Action

Materials:
None for this activity

Task:
Katrina and Malcolm worked at Big Tree Kids Camp over the summer and earned $550.00 together. They shared it equally between themselves. Katrina wanted to save most of her money to buy a car, so she put $200 into her savings account. She gave her little brother $20 to go to the movies with friends. How much money did Katrina have left for herself? What percentage is that dollar amount from the original earnings?

X Marks the Spot

Solve for x in these two equations.

$5x - 6 = 3x - 8$	**$6x - 7 = 4x + 7$**

Unit 3 Lesson 1 – Daily Routines – Fraction Action and *X* Marks the Spot

One per student

Acción de fracciones

Materiales:
Ninguno para esta actividad

Tarea:
Katrina y Malcolm trabajaron en Big Tree Kids Camp durante el verano y ganaron $550.00 entre los dos. Lo compartieron entre ellos en partes iguales. Katrina quería ahorrar la mayor parte de su dinero para comprar un auto, por lo que puso $200 en su cuenta de ahorros. Le dio $20 a su hermano menor para que fuera al cine con sus amigos. ¿Cuánta plata le quedó a Katrina para ella? ¿Qué porcentaje es esa cantidad de dólares de las ganancias originales?

X Marca el sitio

Resuelve para *x* en estas dos ecuaciones.	
$5x - 6 = 3x - 8$	**$6x - 7 = 4x + 7$**

Unit 3 Lesson 1-3 – Daily Routines - CGI Problems

One per student

CGI – *Where the Sidewalk Ends*

	Multiplication	**Measurement Division**	**Partitive Division**
Grouping/ Partitioning	If you stack _____ rows of _____ quarters each. How many quarters would you stack? (7, 9) (23, 7) (12, 15)	If you have _____ quarters that you want to stack in equal stacks of _____ quarters each, how many stacks can you make? (56, 8) (112, 7) (336, 21)	You have _____ quarters that you want to share equally among _____ friends. How many quarters will each friend receive? (49, 7) (288, 12) (216, 9)
Rate	The Gypsy walked _____ miles per hour. If she walked a constant rate, how many miles did she walk in _____ hours? (15, 3) (12.2, 3) $(12\frac{1}{2}, 3)$	The Gypsy walked _____ miles per hour. At that rate, how long did it take her to walk _____ miles? (15, 45) (12.2, 48.8) $(12\frac{1}{2}, 37\frac{1}{2})$	The Gypsy walked a total of _____ miles in _____ hours. If she walked at a constant speed, how many miles an hour did she walk? (45, 3) (48.8, 4) (50, 4)
Price	Hector bought _____ broken toys at _____ each. How much did he pay for the broken toys? (15, $.27) (21, $.50) (124, $.75)	Hector found broken toys that cost _____ each. How many broken toys could he purchase for _____? ($.25, $1.50) ($.75, $4.50) ($.95, $5.70)	Hector bought _____ broken toys for which he paid a total of _____. If each toy cost the same, what did he pay per toy? (12, $3.00) (24, $18.00) (36, $45.00)

Unit 3 Problemas CGI para *Where the Sidewalk Ends*

	Multiplicación	División para medir	División partitiva
Agrupar/ Separar	Si formas _____ montones con ____ monedas de 25¢ en cada uno, ¿cuántas monedas hay en total? (7, 9) (23, 7) (12, 15)	Si tienes _____ monedas de 25¢ y quieres ponerlas en montones iguales de ____ monedas cada uno, ¿cuántos montones puedes hacer? (56, 8) (112, 7) (336, 21)	Tienes ___ monedas de 25¢ que quieres repartir en partes iguales entre tus ____ amigos. ¿Cuántas monedas recibirá cada amigo? (49, 7) (288, 12) (216, 9)
Velocidad (tasa)	La gitana caminó ___ millas por hora. Si caminó a una velocidad constante, ¿cuántas millas caminó en ____ horas? (15, 3) (12.2, 3) (12 1/2, 3)	La gitana caminó ___ millas por hora. A esa velocidad, ¿cuánto tiempo se tardó en caminar ____ millas? (15, 45) (12.2, 48.8) (12 1/2, 37 1/2)	La gitana caminó un total de ___ millas en ____ horas. Si caminó a una velocidad constante, ¿cuántas millas por hora caminó? (45, 3) (48.8, 4) (50, 4)
Precio	Héctor compró _____ juguetes dañados a _____ cada uno. ¿Cuánto pagó por los juguetes dañados? (15, $.27) (21, $.50) (124, $.75)	Héctor encontró unos juguetes dañados que costaban_____ cada uno. ¿Cuántos juguetes dañados podría comprar con _____? ($.25, $1.50) ($.75, $4.50) ($.95, $5.70)	Héctor compró _____ juguetes dañados por los que pagó un total de _____. Si cada juguete costó lo mismo, ¿cuánto pagó por cada juguete? (12, $3.00) (24, $18.00) (36, $45.00)

Unit 3 Writing Workshop

- **Genre: Poetry**

- Writing Objective: Students will write free verse poetry that sends the reader a message.

- Organization of text:
  - Students write free verse poetry – poems that don't rhyme, or have a certain number of words/syllables per line. The reason for choosing free verse poetry is that it gives students much more freedom to express themselves; they don't need to limit their word choice to trying to find a rhyme, or trying to use a certain number of syllables. Also, for ELLs it is very difficult to think of rhymes for what they want to express. Free verse poetry allows ELLs to use the language they know to communicate their ideas about a topic.

- Possible sequence of mini-lessons:
  1. Brainstorm: Share with students examples of free verse poems. Show how they can take any shape. Some lines might be long, others short; the lines don't have to rhyme. The poet can simply express an idea freely!

     Discuss with students how Shel Silverstein uses his poems to send a message to readers. What messages have we seen in some of his poems? What other messages might people want to express through poems? Have students brainstorm a list, and write them down. Guide students to think about the kinds of social issues that middle school student's face – these should be on the list. For example: moving to a new country/city/town; bullying; fitting in; feeling lonely; the importance of a true friend; family; etc. Free verse poetry is an excellent way for students to express the complex issues they encounter in their daily lives.

     Have students jot down in their notebooks what topics they might want their poems to express. What message do they want readers to understand from reading their poems?

  2. Draft: Model for students how you take a topic for a poem (and the message you want to express with that topic), and how you draft a poem using free verse.

     Provide time for students to write independently to draft a free verse poem. Students may draft multiple poems. You can also encourage students to write a poem in their native language that expresses a similar idea as what they wrote in English.

     Circulate to help students think of how they want to express their message through the poem.

  3. Revise: Model for students how you look at a poem you've written, and think about other words you could use that would paint a better picture for the reader. Identify some "basic" words that you could change for a more interesting **synonym.** Remind students of how they have been working with synonyms in each of the Classroom Lessons. Students can use a website like www.thesaurus.com to search for synonyms. They can also use the Thesaurus feature on Microsoft Word.
     Circulate while students are working and help them think of synonyms. You can also continue to help students think about how to express a particular message through free verse poetry.

  4. Publish: Have students read aloud their poems to the class, in English as well as their native language if they chose to write multilingual poems. Students can discuss the social issues their classmates wrote about, and what message they think each poem has.

Literature Selection
Where the Sidewalk Ends
(poem – SMART, p 35)
by Shel Silverstein
El más listo (p. 35)
Classroom Set

Materials
- **BLM** Vocabulary Cards
- Online or book dictionaries
- Online or book thesaurus 1 per group 4 if books
- **BLM** Synonym Story Poster teacher sample
- **BLM** Picture cards for "Smart" poem
- 12 x 18 white or light color construction paper 1/student
- markers or crayons

Literature Vocabulary
swapped
traded
collector
gypsy
gypsies

Math Vocabulary
ratio
equivalent
rate
unit rate
percent of
discount
tip

ELPS (English Language Proficiency Standards - TX)
2C, 2I, 3D,4F, 4J, 4K, 5B, 5G

Synonyms Mini-Unit
Mini-unit on synonyms.
http://www.educationworld.com/a_lesson/04/lp334-01.shtml

Unit 3, Lesson 1 — Grades 7-8

Classroom Lesson

Every day teachers must post the objectives on the board, read them to the students, and have students read them together with the teacher. At the end of the lesson, teacher and students should review to see if they have accomplished both math and language objectives.

Math Objectives:
- Determine the comparison value of a set of coins based on diameter of coin rather than face value.
- Compare student-generated measurements.

Reading Objective:
- Infer the meaning of a poem and the author's purpose.

Language Objectives:
- Identify synonyms to expand vocabulary.
- Write about a poem using synonyms.

BEFORE READING
Building Background – Literature
Explain that for this unit, they will be reading different poems by the author Shel Silverstein.

Ask, "Are any of you familiar with Shel Silverstein? What do you know about him?"

Ask, "Have you ever read any of his poems?" *(Perhaps the poem from Grade 4-5 last year, "Boa Constrictor," from* ***Where the Sidewalk Ends***). If students remember, ask them to tell you something about his poem.

Use the Shel Silverstein website to introduce the author through his photos http://shelsilverstein.com/indexSite.html
His website is very artistic; discuss how Silverstein illustrates all of his poems. Explain to students that Silverstein writes humorous poems. But, in many of his poems he also includes some sort of message to his readers.

"Shel invited children to dream and dare to imagine the impossible." *(From "About Shel" on the noted website)*

Building Background – Vocabulary
Show students the title of the first poem: "Smart." Ask, "What do you think this poem will be about?"
Explain that in this poem there is a boy who **swapped** something his dad gave him for something else. Show students the word card for *swapped.*

Ask, "What does *swapped* mean?"

Past-tense Mini-Unit
Teach a mini-unit on verbs that need the final consonant doubled before adding an ending, such as swap to swapped.
http://www.am.dodea.edu/bragg/devers/Elements%20of%20Literacy/Session%201/Articles%20and%20Questions/Word%20Study%20-%20Intermediate%20Classrooms.pdf

Pirate's Corner
Share the class's most original synonym poster online today in Pirate's Corner.

Launch Unit 3 Writing Workshop
For this unit, students will be writing their own poetry about a topic of their choice. Their poetry will have an underlying message for the reader, just like many of Shel Silverstein's poems.

See Writing Workshop for an outline of possible mini-lessons.

Unit 3, Lesson 1 — Grades 7-8

Classroom Lesson - continued

Build on students' responses to arrive at the idea that it means giving away something and taking something else in return.

Synonym/Antonym Web activity
What other words mean something similar to *swap*? What are some synonyms?

Create a Synonym Web for the word *swap*. To show that the words have a similar meaning, you can write them in green. If you add any antonyms, you can write them in red. This provides a visual for students to understand the relationship between the words.

You can scaffold students' sharing by providing guiding questions if necessary. For example:

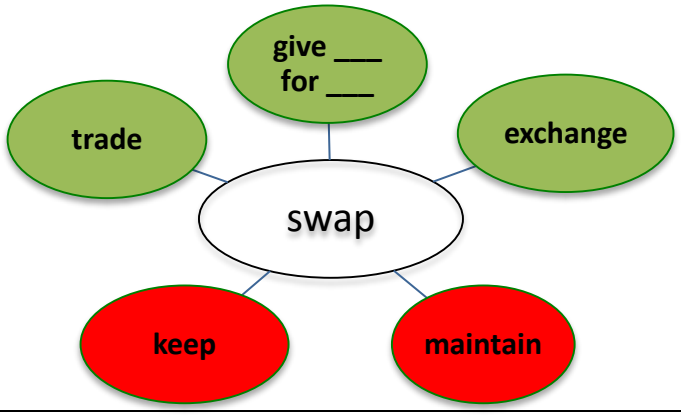
- Ask, "When you want to take something back to a store, and get something else instead, what do they call that?" *exchange*

- When colonists arrived in the Americas, they **swapped** things with the indigenous people – for example, the indigenous people gave animal furs, and the colonists gave beads. Do you remember the word we use in social studies to describe this instead of the word *swap*? *trade*

  Note: When students' share the word *trade (or when you introduce it to students)*, show them the word card for *traded*, and put it on the word wall. Explain that the verb is in the past tense, because this poem is about a boy who traded things in the past.

Build on what students share, adding other synonyms they don't think of. You can also include antonyms on this web. Ask, "What are some antonyms for *swap*?" (What is the opposite of *swap*?)

After guiding students to determine antonyms, your Synonym/Antonym Web could look like the following example. Ask students why they think it is important to learn synonyms and antonyms.



Guided Reading Groups and Independent Reading Connection
If you conduct guided reading groups as part of your balanced literacy instruction, or provide time for independent reading, you can reinforce these same reading strategies.

After students have read the text on their own, to improve their comprehension of the more difficult parts:

- Monitoring for Comprehension: When you ask students questions about the key ideas and details in the text, have them point to specific excerpts from the text. This helps students provide text evidence to support their response.

- Inferring: What is the author really saying in this part?

  When it says _____, what does that really mean?

  Why did the author write this? (the author's purpose)

  How is this character really feeling? How do you know?

Listening Center: Independent Reading
Let students listen to "*Smart"* in a Listening Center as part of their independent reading time.

Students can also listen to other Shel Silverstein poems at his website:
http://shelsilverstein.com/html/books.asp
The website is a great way for students to read along as they listen to someone read aloud different poems, and watch the animations that accompany the poems.

Classroom Lesson - continued

DURING READING
Comprehensible Input – Literature & Vocabulary
For this read aloud, the goal is to support students' comprehension of the text by modeling and practicing several reading strategies:

- **Monitoring for Comprehension**
- **Inferring (including Author's Purpose)**

For this short poem, you will read it aloud without stopping, and then discuss it afterwards with students, using these two reading strategies.

Have the poem displayed somewhere the whole class can see, such as written on chart paper, or projected onto a screen. If this is not possible, then pass out copies of ***Where the Sidewalk Ends*** from the classroom set right before you begin the read aloud, and have students open up to the poem "Smart."

ELLs: To provide more visual support while reading this poem, you can use the **BLM** picture cards that show images of the money the boy trades in the poem. While reading the poem aloud, simply affix or display each picture card next to the appropriate lines. You can also have this done ahead of time.

Read the poem aloud to the students. Afterwards, ask the following discussion questions:

Monitoring for Comprehension

- Teacher Question: In this poem, what does the boy swap *(or trade)*? Talk with your partner.

  Regroup the class and have students share. Help students refer to specific lines in the poem when sharing. *(Ex: The boy swaps his money for more coins, but smaller and smaller amounts. For example, in line 3 it says he swapped one dollar for two quarters.)* If students don't refer to a specific line, then after they share, ask, "What line or lines from the poem gave you that information?"

Inferring

- Teacher Question: The boy thinks his dad is very proud of him. How is the dad *really* feeling at the end of the poem? How do you know? Talk with your partner.

  Regroup the class, and have a few students share. Again, make sure they reference specific lines of the poem to provide text evidence.

Inferring

- Teacher Question: Why do you think Shel Silverstein titled this poem "Smart?"

Beginning ELLs: Benefit from listening to these short poems. They can listen to them repeatedly to develop word recognition, and also develop their sense of rhyme in English.

Intermediate & Advanced ELLs: Benefit from listening to a poem repeatedly to develop fluency, and reading along softly when possible. Have students record themselves reading *"Smart"* aloud using the podcast tool on MAS Space. Then, they listen to that poem several times, reading along softly. When they feel they've had enough time to practice, they record themselves reading the poem again. Have students compare their two recordings to see how their fluency has improved.

You may want to give students the option to post their recordings of the poem on MAS Space.

Independent Reading
The goal is to immerse students in poetry this week. Throughout the unit, have the classroom set copies of ***Where the Sidewalk Ends*** available for students to read during independent reading time. This will give students the opportunity to read the poems you share as a class, as well as other poems by Shel Silverstein.

If possible, create a "Poetry" book basket that students can choose from to read poetry from other authors. This basket can include books of poetry, as well as photocopies of poems. You can photocopy on cardstock a variety of poems you think your students will connect with.

Classroom Lesson - continued

- Teacher Question: Why do you think Shel Silverstein wrote this poem? *(What is the author's purpose?)*

Use students' discussion to arrive at the idea that "bigger isn't always better."

After this discussion of the poem, have the class read the whole poem with you as a Shared Reading. They can do this either by looking at the poem you have displayed or by reading from their copy of the book.

AFTER READING
Practice and Application – Vocabulary & Literature
Synonym Story Board activity

1. Explain: To explain what happened in this poem, we are going to create a Synonym Story Poster. We will use the synonyms from our web to explain all of the things the boy in the poem swapped.

2. Model how to make a Synonym Story Poster – your example can be the **BLM Synonym Story Poster**. Please use this just as an example for you to recreate the poster in front of the students, beginning with the oval in the center. Be sure to write the word, then create the opening sentence that uses the word. The first synonym then picks up the story line and continues.

3. Tell students they will be writing the same type of Synonym Story Poster to explain what happened in "Smart," using synonyms for *swapped.*

4. Have students create their synonym poster. As you circulate the room, ask them to read their sentences to you.

ELLs: While students are working, you may want to pull a small group of ELLs who you feel will struggle with this writing activity. Help ELLs write a different synonym in each bubble on the Story Board, copying the words from the Synonym Web you created at the beginning of the lesson. Then, to add a sentence for each synonym explaining what happened in the poem, you can use shared writing. Have the students orally explain what happened in the poem, and then you write down a complete sentence for each part using their ideas. If students are able, they can copy these sentences onto their Story Boards.

Listen to SMART
http://www.super-childrens-books.com/smart-by-shel-silverstein.html
Shel Silverstein reading "SMART" with students performing the poem.

http://www.marketplace.org/topics/life/poetry-project/poem-smart-shel-silverstein
Students reading the poem "SMART."

Unit 3, Lesson 1 — Grades 7-8

Classroom Lesson - continued

Transition to Math

Refer back to the Measurement Lab activity in the Daily Routines. If you have not finished the Lab, do so now before continuing this Math Transition.

Money is not valued by the side of the bill or coin, but if the son in the poem had made the measurement poster from the Measurement Lab, what conclusions could he have made? Justify your answers.
Share thoughts in small groups, then have a spokesperson from each group share the group's thoughts with the whole class.
(Some thoughts might be: if the value of coins were based on diameter,

- *a nickel would be worth more than a penny and a dime;*
- *a penny would be worth more than a dime;*
- *a quarter would be worth more than each of the other coins individually, BUT:*
    - *2 quarters would be worth less than 3 dimes*
    - *3 dimes would be less than 4 nickels*
    - *4 nickels would be less than 5 pennies)*

Students will use their posters during the Math Lesson for today.

Objectives
Read through the language and math objectives with the students, having them tell you how they accomplished each.

Duplicate on cardstock and cut apart for word cards.

swapped

traded

collector

gypsy

cambiar (algo por algo)

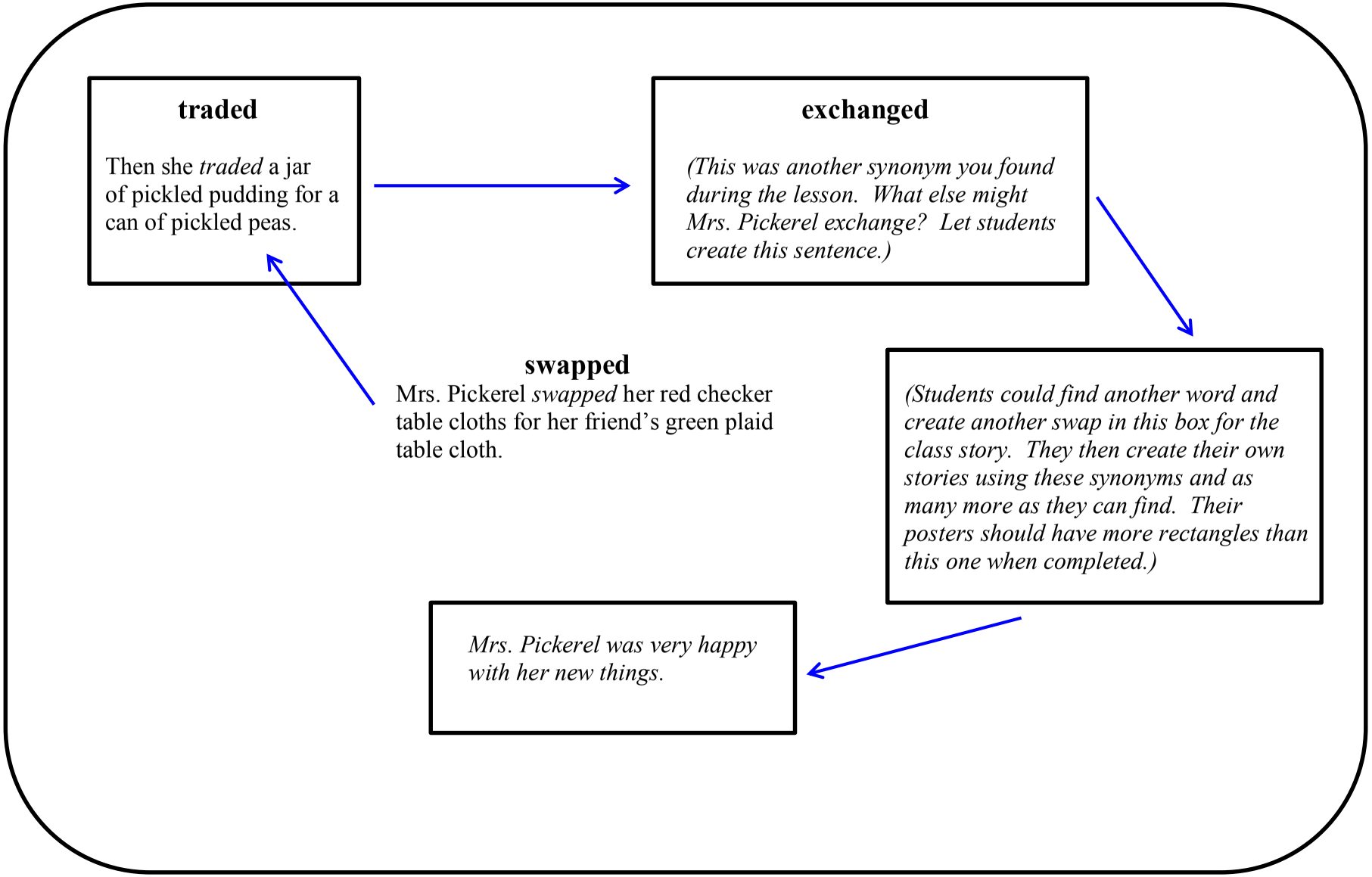
intercambiar (algo por algo)

colleccionista

gomias

Unit 3 Lesson 1 – Classroom Lesson
Teacher guide

Vocabulary Synonym Story Sample Poster – *Where the Sidewalk Ends*



Materials
- **BLM** Fractions, Decimals, Percents

Math Vocabulary
ratio
equivalent
rate
unit rate
percent of
discount
tip

Literature Vocabulary
swapped
traded
collector
gypsy
gypsies

ELPS (English Language Proficiency Standards - TX)
2F, 2G, 2I, 3C, 3E, 3H, 3J

Unit 3, Lesson 1 — Grades 7-8

Math Lesson

Math Objectives:
- Find ratio of single coin value to a dollar.
- Find fraction and decimal representation of single coin value out of a dollar.
- Find percent of coin value of a dollar.
- Compare the amount the SMART son had to a dollar and find the percent of a dollar for each swap.
- Find the percent of money missing from the dollar for each swap.

Language Objectives:
- Listen and follow directions.
- Verbalize strategies and justify your actions.

Building Background
In earlier units we found how to set up ratios to compare quantities. What is a ratio?

A ratio is a comparison and can be expressed several ways. For example, Let's find the ratio of the number of coins it takes to make a dollar and one dollar?

Quarter: verbally we can say there are 4 quarters to 1 dollar.

Numerically there are three ways: 4 to 1, also expressed 4:1 and $\frac{4}{1}$.
All of them tell us it takes 4 quarters to make 1 dollar.

What about a dime? What is the ratio of the number of dimes it takes to make a dollar to one dollar?
Have students express the ratio in words, and three different numerical ways.

10 dimes to 1 dollar; 10 to 1; 10:1, and $\frac{10}{1}$.

(Continue in the same fashion for nickels and then pennies.)

What we want to find today is the PERCENT OF the dollar for each of the coin values. PERCENT means "per 100."

The question to be answered today is:
- What *percent of* one dollar is one _____ *(and we'll use each coin to fill in this blank.)*

Math Lesson - continued

As you work today, students should be expected to work along with you as you model the examples and to respond to your questions. Take the opportunity to let them converse with an elbow partner or have a whole class discussion.

Comprehensible Input

We found the ratio of the number of quarters to one dollar to be $\frac{4}{1}$.

But what PERCENT OF one dollar is one quarter? Predict what percent of $1.00 you think a quarter would be and justify your prediction. *(You might need to remind the students that a dollar is 100 cents.)*

There are many ways to solve this problem. We are going to investigate a few.

First we could solve this by drawing a picture.

I know that the ratio of quarters to a dollar is 4 to 1, so that means that there are four quarters to every dollar. I can draw a picture to represent that.

Each rectangle represents one quarter. Now I can SEE that one quarter is one-fourth of a dollar.

But we have not represented PERCENT yet. Remember, PERCENT means so many parts of 100. So, let me use a little arithmetic and what I know about equivalent fractions/ratios to find parts of 100.

My quarter is one-fourth of a dollar. And I need that ratio to have a 100 as the denominator to easily figure out the percent. I can create this equivalent ratio by setting them equal to each other like this:

$$\frac{\mathbf{1}}{\mathbf{4}} = \frac{\mathbf{?}}{\mathbf{100}}$$

So, one quarter out of a dollar *(which is represented by the four quarters in the denominator)* is "something" out of 100… Use the variable *x* to represent the unknown value.

$$\frac{\mathbf{1}}{\mathbf{4}} = \frac{\boldsymbol{x}}{\mathbf{100}}$$

Now solve for *x*.

	Unit 3, Lesson 1 **Grades 7-8** **Math Lesson** - continued --- These are compatible numbers, as well as, benchmark numbers when working with money and percents. $\frac{1}{4} \rightarrow = \frac{x}{100}$ There is a relationship of 25 here. In other words, I can multiply 4 by 25 to get 100. Since these are equivalent ratios and the equation must stay balanced, this relationship must also be true for the numerators. This results in *x* equaling 25. $\frac{1}{4} = \frac{25}{100}$ What did creating this equivalent fraction over 100 mean? *(It means I can figure out my percent, and therefore know what percent one quarter is out of a dollar.)* 1 quarter of a dollar is 25% as defined by the ratio $\frac{25}{100}$. This can be written as a decimal 0.25. Students should make the connection that a quarter written as money is the same $0.25. **MAS Space** Share the class's most original synonym poster online! **Objectives:** Read through the math and language objectives, making sure that students understand how they accomplished each.

Unit 3 – Math Lesson – Vocabulary

Duplicate on cardstock and cut apart for word cards.

ratio
equivalent
rate
unit rates

Unit 3 – Math Lesson – Vocabulary

Duplicate on cardstock and cut apart for word cards.

percent of
discount
tip

Duplicate on cardstock and cut apart for word cards.

razón

equivalente

tasa

tasa unitaria

Duplicate on cardstock and cut apart for word cards.

porcentaje de
descuento
propina

Unit 3 Lesson 1 – Math Lesson

One per student

Fractions, Decimals, Percents

Fill in the table and answer the questions below. Be sure to show your strategies.

	fractional part of a dollar	equivalent fraction in hundredths	decimal representations	percent of a dollar
quarter				
dime				
nickel				
penny				

What percent of one dollar were the two quarters?

What percent of one dollar was the boy lacking in the quarter swap?

What percent of one dollar were the three nickels?

What percent of one dollar was the boy lacking in the nickel swap?

What percent of one dollar were the four dimes?

What percent of one dollar was the boy lacking in the dime swap?

What percent of one dollar were the five pennies?

What percent of one dollar was the boy lacking in the penny swap?

U**nidad 3**

Lección 1 – Lección por TV– Fracciones, decimales, porcentajes

Monedas	**Fracción de un dólar**	**Fracción equivalente en centésimos**	**Representación decimal**	**Porcentaje de un dólar**
25¢				
10¢				
5¢				
1¢				

¿Qué porcentaje de un dólar son 2 monedas de 25¢? Muestra tu estrategia.

¿Qué porcentaje de un dólar le faltaba al niño cuando intercambió monedas de 25¢? Muestra tu estrategia.

¿Qué porcentaje de un dólar son 3 monedas de 5¢? Muestra tu estrategia.

¿Qué porcentaje de un dólar le faltaba al niño cuando intercambió monedas de 5¢? Muestra tu estrategia.

¿Qué porcentaje de un dólar son 4 monedas de 10¢? Muestra tu estrategia.

¿Qué porcentaje de un dólar le faltaba al niño cuando intercambió monedas de 10¢? Muestra tu estrategia.

¿Qué porcentaje de un dólar son 5 monedas de 1¢? Muestra tu estrategia.

¿Qué porcentaje de un dólar le faltaba al niño cuando intercambió monedas de 1¢? Muestra tu estrategia.

Unit 3

Lesson 1 – TV Lesson – Fractions, Decimals, Percents **TEACHER KEY**

Coins	Fractional Part of a Dollar	Equivalent Hundredths Fraction	Decimal Representation	Percent of a Dollar
Quarter	$\frac{1}{4}$	$\frac{25}{100}$	0.25 read 25 hundredths	25%
Dime	$\frac{1}{10}$	$\frac{10}{100}$	0.10 read 10 hundredths	10%
Nickel	$\frac{1}{20}$	$\frac{5}{100}$	0..05 read 5 hundredths	5%
Penny	$\frac{1}{100}$	$\frac{1}{100}$	0.01 read 1 hundredth	1%

What percent of one dollar were the two quarters? Show your strategy.

Any strategy student can explain reasonably for the solution gained. 50%

What percent of one dollar was the boy lacking in the quarter swap? Show your strategy.

Any strategy student can explain reasonably for the solution gained. 50%

What percent of one dollar were the three dimes? Show your strategy.

Any strategy student can explain reasonably for the solution gained. 30%

What percent of one dollar was the boy lacking in the dime swap? Show your strategy.

Any strategy student can explain reasonably for the solution gained. 70%

What percent of one dollar were the four nickels? Show your strategy.

Any strategy student can explain reasonably for the solution gained. 20%

What percent of one dollar was the boy lacking in the dime swap? Show your strategy.

Any strategy student can explain reasonably for the solution gained. 80%

What percent of one dollar were the five pennies? Show your strategy.

Any strategy student can explain reasonably for the solution gained. 5%

What percent of one dollar was the boy lacking in the penny swap? Show your strategy.

Any strategy student can explain reasonably for the solution gained. 95%

Materials
- **BLM** Recursive Review Problems Lessons 1-3

Math Vocabulary
ratio
equivalent
rate
unit rate
percent of
discount
tip

Literature Vocabulary
swapped
traded
collector
gypsy
gypsies

ELPS (English Language Proficiency Standards - TX)
2I, 3E, 3H, 4F, 5G

Unit 3, Lesson 1 — Grades 7-8

Follow-up

Math Objectives:
- Find ratio of single coin value to a dollar.
- Find fraction and decimal representation of single coin value out of a dollar.
- Find percent of coin value of a dollar.
- Compare the amount the SMART son had to a dollar and find the percent of a dollar for each swap.
- Find the percent of money missing from the dollar for each swap.

Language Objectives:
- Listen and follow directions.
- Verbalize strategies and justify your actions.
- Explain problem solving strategy to peers.
- Explain how finding unit rates can be helpful for you and your family.

Practice and Application
Based on your Math Lesson observations of the students, divide students into three groups:
a) understand concept with minimal help
b) understand concept with some help
c) do not understand concept and need small group instruction with teacher

Practice similar problems with compatible numbers for the small group instruction. Typically, their struggles will be the arithmetic if they haven't made solid number relationships, or understanding WHY it's necessary to find an equivalent fraction over 100.

QUESTIONS
- What do the numbers in this fraction represent?
- What do the numbers in this ratio represent?
- How did you find the equivalent fraction with a denominator of 100?
- What does the decimal represent?
- How do you read the decimal?
- How can number sense help you in answering this question? *(regarding percent of dollar lacking)*
- Explain the relationship among the fraction/decimal/percent representations.

Technology Option Unit Pricing – for 1 or 2 players or 2 teams http://www.quia.com/cb/195515.html	**Unit 3, Lesson 1** **Grades 7-8** **Follow-up** - continued --- **Recursive Review** *Please use* **BLM** *to answer the Recursive Review questions.* • Suppose you live 3 miles from school. When you are fresh in the morning, you can jog a mile in 10 minutes. But by the afternoon it takes you 15 minutes to walk a mile. How long does it take you to walk to and from school each day? **Writing Topics** **Independent Writing Topic** Students will have a daily writing activity which will incorporate the day's focus math vocabulary. ▪ **Explain why finding an equivalent fraction in hundredths can be helpful when representing percents.** **Objectives** Review the math and language objectives to make sure that they were accomplished and that the students realize how they were accomplished.

Unit 3 Lessons 1-3 – Follow-up

Recursive Review Problems

Solve the recursive review problems using any strategy of your choice.

Unit 3 Lesson 1

Suppose you live 3 miles from school. When you are fresh in the morning, you can jog a mile in 10 minutes. But by the afternoon it takes you 15 minutes to walk a mile. How long does it take you to walk to and from school each day?

Unit 3 Lesson 2

Mr. Juarez was printing the signs for his weekly produce sales. What would a customer pay for only 1 pound of apples?

Unit 3 Lesson 3

Angel made a model of a B-52 Bomber with a scale of 1:144. If the actual plane measures 159 ft. long with a wingspan of 185 ft., what are the dimensions on Angel's model rounded to the nearest tenth of a foot?

Repaso recursivo

Resuelve este problema de velocidad. Muestra tu trabajo.

Unit 3 Lesson 1

Supón que vives a 3 millas de la escuela. Cuando estás descansado en la mañana, puedes correr una milla en 10 minutos. Pero en la tarde te tardas 15 minutos en caminar una milla. ¿Cuánto tiempo te tardas en ir y venir de la escuela cada día?

Unit 3 Lesson 2

El Sr. Juárez estaba imprimiendo los anuncios para su venta semanal de frutas y verduras. Este uno de sus anuncios.

¿Cuánto pagaría un cliente si solo necesitara una libra?

Manzanas
5 libras por
$3.00

Unit 3 Lesson 3

Ángel hizo un modelo de un bombardero B-52 con una escala de 1:144.

Si el bombardero real mide 159 pies de largo y tiene una envergadura de 185 pies, ¿cuáles son estas 2 dimensiones del modelo de Ángel?

Materials
- 1 dill pickle
- 2 paper dessert plates
- 2 paper towels
- 1 plastic knife

All items listed above per partner pair
- **BLM** Dill Pickle-Snack Fractions

Math Objectives
- Use addition, subtraction, multiplication and division to solve problems involving fractions and decimals.
- Convert between fractions, decimals, whole numbers and percents.
- Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios).
- Estimate and find solutions to application problems involving percent.

Language Objectives
- Discuss how ratios and proportions can be used to solve real-world problems.

Math Vocabulary
ratio
equivalent
rate
unit rate
percent of
discount
tip

Literature Vocabulary
swapped
traded
collector
gypsy
gypsies

Unit 3, Lesson 1 — Grades 7-8

Snack Fractions

Students should wash their hands before this activity if using food items.

Snack Fractions
Students should have the skills to answer these in small groups. Have the students work through the BLM before sharing the actual snack.

Circulate the room while students are working on the BLM, asking questions as needed to guide, redirect, extend:

QUESTIONS
- Explain how you would calculate the percent of the total number of pickles ONE pickle represents.
- How can you use proportions to find the percent that your fractional portion represents of the whole jar?

Finally, let them share the dill pickle with a partner.

(*Naturally, if you think the portions suggested in the materials list are too small for a middle schooler's snack, feel free to increase the amounts; make sure, though, that you make the amounts easily divided in halves – they've already done a great deal of work to get the snack.)*

Snack Fraction Journal Writing: BLM Dill Pickle Fractions

Objectives: Review the objectives with the class, making sure they understand how they achieved each.

Unit 3 Lesson 1 – Snack Fraction

One per student

Dill Pickle – Snack Fractions

Work with your partner to solve the problems. Be sure to show your strategies.

There were _____ pickles in the jar before it was opened and shared with the class.

What percent of the jar does your half represent?

My teacher paid _____ for the jar of pickles.

What would the cost of one pickle be based on that price?

If the jar goes on sale for 25% off, what would the new price be?

What would the cost of one pickle be based on the sale price?

Una por estudiante

Unit 3 Lesson 1 – Snack Fraction

One per student

Pepinillos – Fracciones de refrigerios

Colabora con tu compañero para resolver los problemas. Asegúrate de mostrar tus estrategias.

Había _____ pepinillos en el frasco antes de abrirlo y compartirlos con la clase.

¿Qué porcentaje del frasco representa tu mitad?

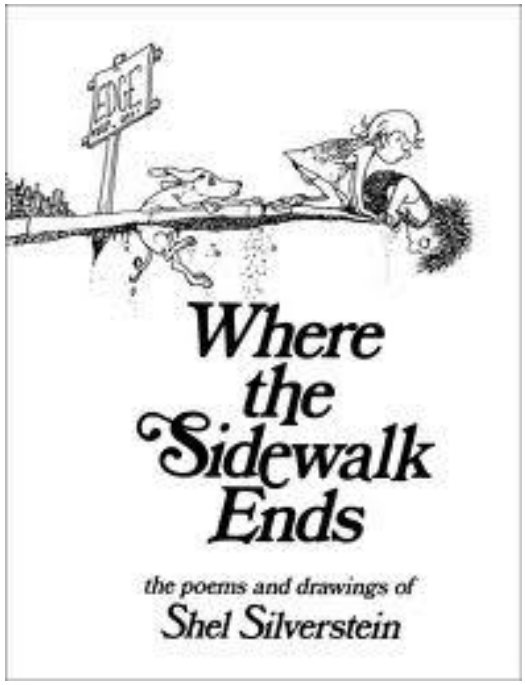
Mi maestro pagó _____ por el frasco de pepinillos.

¿Cuál sería el costo de un pepinillo basado en ese precio?

Si ponen el frasco en oferta a un 25% menos, ¿cuál sería el nuevo precio?

¿Cuál sería el costo de un pepinillo basado en el precio de oferta?

Unit 3 Lesson 1 – Family Fun



Dear _____,

We read the poem *Smart* by Shel Silverstein in the book ***Where the Sidewalk Ends***.

Our math lesson used these ideas from the story…

_____
_____
_____
_____
_____
_____

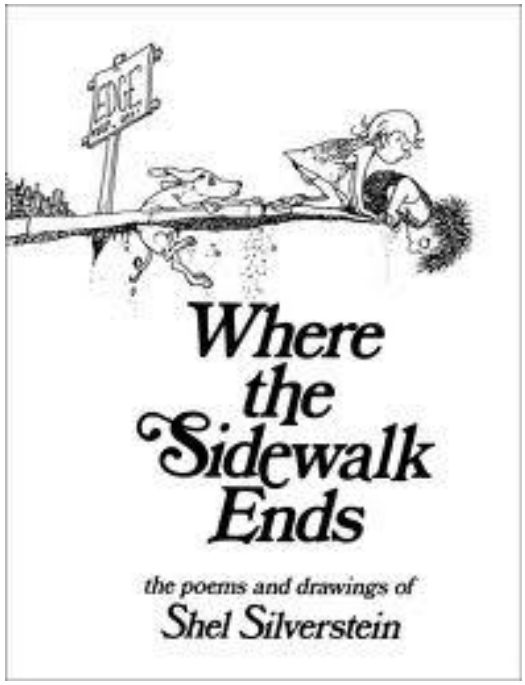
My teacher would like for us to:

- find an item on sale and calculate its new price before tax.

Sincerely,

_____

Unit 3 Lesson 1 – Family Fun



Querido/a_____,

Leimos el poema *Smart por* Shel Silverstein en el libro ***Donde el camino se corta***.

La lección de matemáticas empleó estas ideas del poema…

_____
_____
_____
_____
_____
_____

A mi maestro/a le gustaría que nosotros:

- Buscar algo en venta y calcular el nuevo precio sin impuestos.

Atentamente,

_____

Materials
- **BLM** Collector's Box-Measurement Lab Record Sheet
- **BLM** Solve It! Problem 3
- **BLM** Fraction Action and *X* Marks the Spot
- **BLM** Lessons 1-3 CGI ***Where the Sidewalk Ends*** (listed in Lesson 1)

Math Objectives
- Solve word problems using a variety of strategies and defend their strategies.
- Model and solve 3-step word problems.
- Compose and decompose values to show a new representation of the value.
- Find equivalent fractions.

Language Objectives
- Speak to partners, teacher, and class using vocabulary.
- Discuss problem solving process and strategies.
- Explain how they decided to rename the target number.

Math Vocabulary
ratio
equivalent
rate
unit rate
percent of
discount
tip

Literature Vocabulary
swapped
traded
collector
gypsy
gypsies

ELPS (English Language Proficiency Standards - TX)
2C, 2D, 2E, 2I, 3D, 3E, 4F, 5G

Unit 3, Lesson 2 — Grades 7-8

Daily Routine

The following daily activities will help prepare your students for the Post-assessment. They are not optional.

ESSENTIAL

Measurement Lab
- Lesson 1 – length
- **Lesson 2 – capacity**
- Lesson 3 – *omit*

Lesson 2 Materials
- large box (at least 24"x24"x18")
- assorted broken objects *(enough to fill about 1/4 of the box during the activity)*
- tape measures

Lesson 2 Student Groups (threes)
1) groups measure dimensions of box to nearest inch
2) calculate approximate capacity/volume of box
3) predict the percent of box that will be filled with broken objects
4) after objects are placed in box, groups discuss and then calculate the actual percentage filled by items
5) whole class discussion regarding predictions and actual measurements
6) groups determine percentage of box that is not filled

Solve It! Multi-step problem solving
- Lesson 1 – threes, related problems
- **Lesson 2 – pairs, 3-step problem**
- Lesson 3 – pairs, 3-step problem

Fraction Action
- Lesson 1 – BLM Fraction Action and X Marks the Spot
- **Lesson 2 – BLM Fraction Action and X Marks the Spot**
- Lesson 3 – BLM Fraction Action and X Marks the Spot

***X* Marks the Spot**
- Lesson 1 – BLM Fraction Action and X Marks the Spot
- **Lesson 2 – BLM Fraction Action and X Marks the Spot**
- Lesson 3 – BLM Fraction Action and X Marks the Spot

CGI
- Lesson 1 – rate, measurement division
- **Lesson 2 – rate, multiplication (assessment item 7)**
- Lesson 3 – price, partitive (assessment item 6)

Assessment Items Students are introduced to and practice the skills necessary for success on the following assessment items: 1, 2, 3, 6, 9	**Unit 5, Lesson 2** **Grades 7-8** **Daily Routine** - continued  **----------** **The following activities, although certainly developmentally appropriate for your 7th and 8th grade students, do not specifically address objectives assessed on the Post-assessment. Schools with shorter teaching spans can consider omitting some or all these activities as your time permits.** **----------** **OPTIONAL** **Target Number** • Lesson 1 – Target Number 25 • **Lesson 2 – Target Number 50** • Lesson 3 – Target Number 75 **Money Matters** (*If you have a full program and wish to use this optional activity, you will find BLMs and Explanations in the Optional Activities Tab of your Teacher's Guide*.)

Unit 3 Lesson 2 – Daily Routines - Measurement Lab

One per student

Collector's Box – Measurement Lab Record Sheet

Students should work in groups of three.

Materials:

- large box (at least 24"x24"x18")
- assorted broken objects (enough to fill about 1/4 of the box during the activity)
- tape measures

Task:

1) Measure the dimensions of the box to nearest inch.
   length _____
   width _____
   height _____

2) Calculate the approximate capacity/volume of the box.

3) Discuss within your groups and make an educated prediction of the percent of the box that will be filled with the broken objects your teacher has displayed.

   Prediction percentage _____ *Explain your thinking.*

4) After objects are placed in the box, calculate the actual percentage filled by the items.

   Actual percentage _____

5) After the class discusses their predictions and actual percentages, calculate the percentage of the box that is not filled.

   Percentage not filled _____

Unidad 3 Lección 2 – Rutinas diarias - Laboratorio de medición

Una por estudiante

La caja recolectora - Hoja de registro del laboratorio de medición

Los estudiantes deben trabajar en grupos de 3.

Materiales:

- caja grande (como mínimo de 24”x24”x18”)
- objetos rotos variados (suficiente cantidad como para llenar aproximadamente 1/4 de la caja durante la actividad)
- cinta métrica

Tarea:

6) Mide las dimensiones de la caja a la pulgada más cercana.
   longitud _____
   anchura _____
   altura _____

7) Calcula el volumen/la capacidad aproximados de la caja.

8) Debatan con el grupo y hagan una predicción educada del porcentaje de la caja que se llenará con los objetos rotos que el maestro ha mostrado.

   Porcentaje de predicción _____ *Explica tu razonamiento.*

9) Luego de que los objetos se coloquen dentro de la caja, calcula el porcentaje real llenado por los artículos.

   Porcentaje real_____

10) Luego de que la clase debata sus predicciones y porcentajes reales, calcula el porcentaje de la caja que no está lleno.

    Porcentaje no llenado _____

Unit 3 Lesson 2 – Daily Routines - Solve It! Problems (pairs)

One per student

Work with your partner to solve the problem.

Problem 3:

Lupita needed paper plates, cups, plastic ware, and napkins for her 36 guests. She could buy 15 plates for $11.95, 15 cups for $7.89, 20 forks for $3.49, 20 knives for $3.49, and 48 cloth napkins for $8.99. The store also offered a full party set that included everything she needed plus extras such as bowls, a table cloth, and spoons for $124.99. Which is the better buy if she purchases the fewest number of packages needed to cover the number of guests attending the party? How do you know?

Problem Solution Name:	**Solution Verification** Name:

Unit 3 Lesson 2 – Daily Routines - Solve It! Problems (pairs)

One per student

Colabora con tu compañero para resolver el problema.

Problema 3:

Lupita necesitaba platos de papel, tazas, utensilios de plástico y servilletas para sus 36 invitados. Pudo comprar 15 platos por $11.95, 15 tazas por $7.89, 20 tenedores por $3.49, 20 cuchillos por $3.49 y 48 servilletas de tela por $8.99. La tienda ofrecía, además, un juego completo para fiesta que incluía todo lo que Lupita necesitaba, más cosas extra, como tazones, un mantel y cucharas por $124.99. ¿Cuál es la mejor compra si compra el menor número de paquetes necesarios para cubrir el número de invitados que asisten a la fiesta? ¿Cómo lo sabes?

Solución del problema Nombre:	**Verificación de la solución** Nombre:

Unit 3 Lesson 2 – Daily Routines – Fraction Action and *X* Marks the Spot

One per student

Fraction Action

Materials:
None for this activity

Task:
Jonathan had a half yard of fabric from which he needed to cut eighth yard pieces. How many eighth yard pieces will Jonathan cut from the half yard piece? (Draw a picture.)

X Marks the Spot

Solve for x in these two equations.

$(7x + 5) - (2x - 9) = 79$	$\begin{array}{r} (7x + 5) \\ \underline{- (2x - 9)} \\ = 79 \end{array}$

Unit 3 Lesson 2 – Daily Routines – Fraction Action and *X* Marks the Spot

One per student

Fraction Action

Materiales:
Ninguno para esta actividad

Tarea:
Jonathan tenía media yarda de tela de la que necesitaba cortar piezas de un octavo de yarda. ¿Cuántas piezas de un octavo de yarda Jonathan cortará de la pieza de media yarda? (Dibuja una imagen).

X Marca el sitio

Resuelve para *x* en estas dos ecuaciones:

$(7x + 5) - (2x - 9) = 79$	**$\begin{array}{r}(7x + 5) \\ \underline{- (2x - 9)} \\ = 79\end{array}$**

Literature Selection
Where the Sidewalk Ends
(poem – HECTOR THE COLLECTOR, p 46)
by Shel Silverstein
"Chencho Lista, El colectionista" (p. 46)

Materials
- Vocabulary word wall
- Collector's box
- Broken items for the box – some that are beyond repair, some that could be repaired (enough items to fill the Collector's box about quarter full)
- Sentence Stem: If I were a collector, I would collect…
- BLM Version of "Hector the Collector" with visuals
- **BLM** Store Circular – 2 per student

Literature Vocabulary
swapped
traded
collector
gypsies

Math Vocabulary
ratio
equivalent
rate
unit rate
percent of
discount
tip

Colloquialisms
Mini-lesson on Colloquialisms
- gatlin'
- 'lectric

ELPS (English Language Proficiency Standards - TX)
2D, 2E, 2I, 3D, 3E, 3H, 4J. 4K

Unit 3, Lesson 2 — Grades 7-8

Classroom Lesson

Every day teachers must post the objectives on the board, read them to the students, and have students read them together with the teacher. At the end of the lesson, teacher and students should review to see if they have accomplished both math and language objectives.

Math Objectives:
- Understand the concept of discounts.

Reading Objective:
- Infer the meaning of a poem and the author's purpose.

Language Objectives:
- Identify synonyms to increase vocabulary.
- Find words that are in the same "family" and use them to talk about a poem.
- Write a paragraph about a collection.

BEFORE READING
Building Background – Vocabulary & Literature
Show students the title of the Shel Silverstein poem they will be reading today: "Hector the Collector."

Ask, "What is a collector?"
Show students the word card, and have volunteers share their understanding of the word. Help the class understand that a collector is a person who gathers things together as a hobby -- things that they enjoy having around them. Add this word card to the word wall.

Ask, "What do you think this poem will be about?"

Ask, "Do you see a smaller word inside of *collector*? What is the **root word**?"

Help students find the root word, *collect*. From there, see if students can think of another word in this same "word family" *(another word that has the same root)*. If students don't think of it, provide the word *collection.*

Explain: Let me write down these three words so you can see them: *collector, collect,* and *collection.* A collector is a person who collects, or gathers things. The things they collect are called a collection.

Tell them about a collection you have or had as a child. Then, ask if any of them are collectors. What do they collect? How many ____ do they have in their collection?

Classroom Lesson - continued

Say, "You have some interesting collections! We will have to see what collection Hector has in this poem. To give you a clue, think about the box of things we measured during the Daily Routines. They would be very appropriate for Hector's collection."

Take the items out one by one and place them where students can see them. Ask students if they can guess what type of collection Hector has. Do not discredit any guesses. Tell students that as you read the poem, they will see how these items would fit in his collection.

Synonym Web activity
What other words could we use for collection? What are some synonyms?

Technology
Students can use a website such as www.thesaurus.com to find synonyms as well as antonyms for words.

Create a Synonym Web for the word *collection*. To show that the words have a similar meaning, you can write them in green. If you add any antonyms, you can write them in red. This provides a visual for students to understand the relationship between the words.

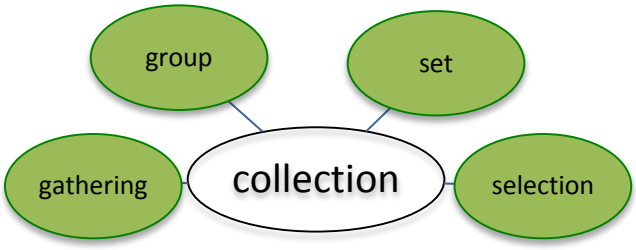
Ask, "Can you think of any synonyms for the word *collection*?"

You can scaffold students' sharing by providing guiding questions. For example:

- Say, "Instead of saying "I have a collection of stamps." I could say, "I have a _____ of stamps." What words could fill in this blank to mean something similar?"

- Ask, "What words do we use in math to talk about things that are together?" *(a group, a set)*

Build on what students share, and add additional synonyms that they don't think of. After guiding students to determine synonyms, your Synonym Web could look like this:



Unit 3, Lesson 2 — Grades 7-8

Classroom Lesson - continued

DURING READING

Comprehensible Input – Literature & Vocabulary

For this read aloud, the goal is to support students' comprehension of the text by modeling and practicing several reading strategies:

- **Monitoring for Comprehension**
- **Inferring (including Author's Purpose)**

For this short poem, you will read it aloud without stopping, and then discuss it afterwards with students, using these two reading strategies.

Have the poem displayed somewhere the whole class can see, such as written on chart paper, or projected onto a screen. If this is not possible, then pass out copies of ***Where the Sidewalk Ends*** from the classroom set right before you begin the read aloud, and have students open up to the poem "Hector the Collector."

ELLs: There is a lot of vocabulary in this poem that will be unfamiliar for many ELLs. To support their comprehension of this text, you can use the **BLM version of the poem**, which has images for each of the items that Hector collects. This provides much-needed visual support for ELLs.

Read the poem aloud to the students. Afterwards, ask the following discussion questions:

Monitoring for Comprehension

- Teacher Question: What does Hector collect? Talk with your partner.

  Regroup the class and have students share. When students talk about the type of things Hector collects, help them refer to specific lines in the poem. *(Ex: Hector collects things that are broken. For example, in line 3 it says he collects dolls with broken heads, and in line 7 it says he collects vases that are chipped.)* If students don't refer to a specific line, then after they share, ask, "What line or lines from the poem gave you that information?"

Inferring

- Teacher Question: How does Hector feel about his collection? How do you know? Talk with your partner.

When you regroup the class, have several students share their inferences. Remember that inferring means "reading between the lines" – students need to read between the lines to interpret how Hector feels. (*He loves his collection so much that he values it more than things that are worth a lot of money, like gold and diamonds. For him, this collection is a treasure, even though the items aren't worth any money.)*

Guided Reading Groups and Independent Reading Connection

If you conduct guided reading groups as part of your balanced literacy instruction, or provide time for independent reading, you can reinforce these same reading strategies.

After students have read the text on their own, to improve their comprehension of the more difficult parts:

- Monitoring for Comprehension
  When you ask students questions about the key ideas and details in the text, have them point to specific excerpts from the text. This helps students provide text evidence to support their response.

- Inferring:
  What is the author really saying in this part?

  When it says _____, what does that really mean?

  Why did the author write this? (the author's purpose)

  What message is the author giving readers?

  How does this character feel? How do you know?

Listening Center: Independent Reading
Let students listen to "*Hector the Collector"* in a Listening Center as part of their independent reading time.

Students can also listen to other Shel Silverstein poems at his website: http://shelsilverstein.com/html/books.asp
The website is a great way for students to read along as they listen to someone read aloud different poems, and watch the animations that accompany the poems.

Beginning ELLs: Benefit from listening to these short poems. They can listen to them repeatedly to develop word recognition, and also develop their sense of rhyme in English.

Intermediate & Advanced ELLs: Benefit from listening to a poem repeatedly to develop fluency, and reading along softly when possible. Have students record themselves reading *"Hector the Collector"* aloud using the podcast tool on MAS Space. Then, they listen to that poem several times, reading along softly. When they feel they've had enough time to practice, they record themselves reading the poem again. Have students compare their two recordings to see how their fluency has improved.

You may want to give students the option to post their recordings of the poem on MAS Space.

Classroom Lesson - continued

Inferring
- Teacher Question: Why does Shel Silverstein call the people "silly sightless people" in line 24? Talk with your partner.

Regroup the class and have several students share.

Inferring
- Teacher Question: Why do you think Shel Silverstein wrote this poem? *(What is the author's purpose?)*

After this discussion of the poem, have the class read the whole poem with you as a Shared Reading. They can do this either by looking at the poem you have displayed, or by reading from their copy of the book.

AFTER READING
Practice and Application: Vocabulary and Literature
Word Family activity

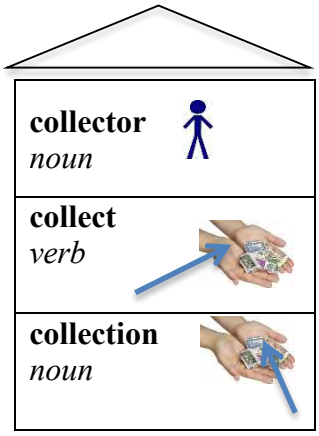
1. Explain: We listed three words that all have the same root – they are in the same "family":
    - collector
    - collect
    - collection

2. Write the three words inside a house to indicate that they are all part of the same "family," leaving space between the words to write a sentence for each one. You can have each word be on a different "floor" of the house. See example below. Have students do the same on their own papers.

3. Explain the difference between the three words. For example, one is a verb, and the other two are nouns.

4. Have students think of their own sentences for each word based on what happened in the poem "Hector the Collector", and have students write their sentences on their own paper.

Classroom Lesson - continued



Hector is a **collector** of things that other people think are just "junk."

Hector **collects** things that he loves with all his soul.

In Hector's **collection**, there are all sorts of broken and old objects that other people throw away.

ELLs: While students are writing these sentences, circulate and work with ELLs at lower English proficiency levels. You can use shared writing to have them orally provide the idea they want to express, and then you physically write the sentence for students. If students are only able to verbalize a few words or a phrase, take the language they use and paraphrase it to turn it into a complete sentence. ELLs can also draw pictures to illustrate the meaning of each word.

Reading Response
What if they could collect anything in the world and had all the room they wanted to store their collection? What would they collect?

Write the following sentence stem on the board:

If I were a collector, I would collect…

Have students write a reading response to finish that sentence stem. Students should elaborate their response by explaining why they would have that type of collection.

Circulate the room as students are writing their paragraphs. When students are finished, ask as many as would like to share with the whole class.

	Unit 3, Lesson 2 **Grades 7-8** **Classroom Lesson** - continued  **Transition to Math** Refer back to the items in the class collector's box. Take each item out and talk about why it is in the box. What is broken on each item? --- Ask the students if the item could be repaired or should it be recycled? Make two piles of items, one of those items that might be repaired and those that just need to be recycled. Look at the items that could be repaired. If someone had these items and repaired them, could they sell them? Would you expect to pay full price for the items? Probably not – they are used and have been repaired. You would want a big DISCOUNT on the item. What are other times that items are discounted? *(sales in the store)* Distribute one sale circular to each student. Tell students this is a "could be" circular if Hector chose to repair some of his treasures and sell them at very reasonable prices. You would like for them each to select five items, total the retail or regular prices of the five items, then total the discounted prices. What would the savings be? After all groups have completed their tasks, ask them to discuss the items, retail prices and the discounted prices. • Why do stores have discounted prices*? (close out items, last-season items, near-to-expired items, leaders to bring you into the store)* • How are discounts helpful to customers? *(saves money)* • How can discounts be harmful to customers? *(buying things you don't really need just because they are on sale)* • What are discounts? *(percent off of retail prices)* Let students read through the poem again in their small groups. What items in the collector's box could be repaired and sold at discount? Which items probably could be recycled if Hector would part with them? **Objectives** Review both language and math objectives, making sure students understand how they accomplished each.

Store Circular

Hector's Treasures

Big Savings

Stuffed Toys Refurbished With Love!

$1
Retail $12.00

$3
Retail $12.00

$2
Retail $12.00

Small Appliances work like new!

$5
Retail $75.00

B R I C K S

Buy One – Buy All!
$0.25 each
Retail $2.50 each

Garden Tools, Just in time for Planting!

$3
Retail $15.00

$3 set
Retail $21.00

Keys that Fit no Locks
$1

Retail $5.00

Retail $2.00

Belts with New Buckles

$1

Retail $25.00

$1
Retail $10.00

Special Dolls Ready to Adopt

$1
Retail $18.00

Boats and Cars with New-found Life

$5
Retail $2,500.00

$50

Retail $25,500.00

Materials
- **BLM** Repaired Items for Sale Problems 1-4
- 4-function calculator (optional)

Math Vocabulary
ratio
equivalent
rate
unit rate
percent of
discount
tip

Literature Vocabulary
swapped
traded
collector
gypsy
gypsies

ELPS (English Language Proficiency Standards - TX)
2D, 2E, 2I, 3D, 3E, 3H, 4J. 4K

Unit 3, Lesson 2 — Grades 7-8

Math Lesson

Math Objectives:
- Find the amount saved when you know the percent of discount and the retail price.
- Find percent of discount when you know the retail price and sales price.
- Find sales price when you know the retail price and the percent of discount.
- Find the retail price when you know the percent of discount and the sales price.

Language Objectives:
- Discuss the various ways to find discount.
- Share ideas with students in your group.
- Explain how to use the discount rectangle to solve discount problems.

Building Background
In our last Math Lesson we worked to understand how to find the ***percent of*** certain things. We're going to continue finding the ***percent of,*** but today we'll be working with retail prices and discounts.

During the math portion of your Classroom Lesson you looked at a "could be" sale circular *(show BLM)* to compare the retail price to the discounted price to find the money saved on the purchase.

You worked with the following terms:

- RETAIL PRICE which is the full price you would pay without the sale.
- DISCOUNT PRICE which is the price you pay during the sale.
- MONEY SAVED which is the amount of money taken off the retail price.

During this lesson we are going to work with percent of discount as we look at some of the items on Hector's Treasures Circular.

- PERCENT OF DISCOUNT is the percent taken off the retail price to get the discount price

Comprehensible Input
When we begin to solve percent of discount problems, there is one very important relationship to remember –

Percent of Discount times the (**Retail Price)** equals **Money Saved.**

Unit 3, Lesson 2 — Grades 7-8

Math Lesson - continued

What would that look like in mathematical terms? Have a quick class discussion and see if you derive the same mathematical equation I do.

% (R) = S

Hopefully yours was similar to this. We will be referring back to this relationship with every problem that we solve.

But first we must understand WHY that equation will result in the amount of money saved. Model this simpler problem for the students:

- In the equation 4 x 6 = ?, you learned in elementary to say "4 groups of 6 equals. . ." That means you have 4 whole groups and each group has a value of 6.
- The same concept works with this equation, $\frac{1}{2}$ x 8 = ?

  Looks scary, huh? Well it shouldn't! Say it the same way you learned to say the easy multiplication problem above, using the term *(or a variation of)* "groups of." You would say, "half 'a group of' eight. So??? What's half a group of 8? 4! That was super easy. The equation was asking you to find half of a group of eight.

The first factor in a multiplication equation tells you how many groups, or how much of a group, you'll have of the next factor. Let's apply that understanding to the percent equation.

- %(R) = S would sound like this… "the percentage-group of the retail price will equal money saved." In other words, asking for only the percentage of the retail price will "get rid of" how much you'll actually pay for the item and leave you with the how much money you'll save.

Let's apply numbers to the equation to help us understand this more.

I have a box of items that Hector the Collector would have been proud to have in his collection. *(show items)*

This stuffed toy goes with *(not the one on the circular)* problem #1 on **BLM** Repaired Items for Sale.

With an elbow partner, decide what information is important in the problem.

We know the Retail Price and the percent of discount. Fill in the lines to answer the questions What do you Know? on your problem sheet.

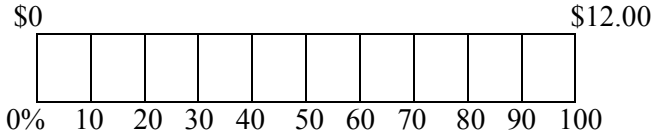
Math Lesson - continued

What do you want to know? Go back into the problem and circle or highlight the data you want to know. *(money saved)*

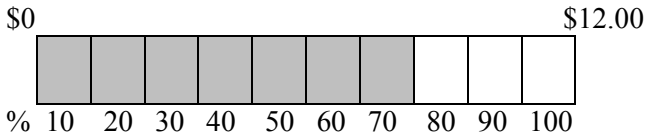
Next, I want you to visualize this problem. There is a rectangle on your handout. This rectangle will always represent the WHOLE, or in this case, the RETAIL PRICE.

I know the Retail Price is $12.00, so I'm going to write 12.00 at the end of the bar, above the upper right corner. *(Have students label their bar models like the one below. Walk them through the steps.)*

I also know that I am discounting this item by 70%. We need to label this on our bar. Using our number sense skills, we realize that 70% is very easily broken into tens. That's great because all numbers are easily broken up into ten pieces. *(This problem will prove what I mean by that.)* The bar below shows my retail price broken up into ten equal pieces with the percentages labeled below the "chunk" they represent.



I want to know the dollar amount that represents 70% of the retail price, so I'm going to shade in 70%, 7-tens, or 7 "chunks" of the bar to represent that unknown dollar amount that I'm saving. We can note this as ***x*** in our equation later. Again, the shaded region is our unknown savings.



Now, back to the statement "all numbers are easily broken up into ten pieces." We already dealt with our percent. It is time to figure out what each of those "chunks" in the bar represent regarding the PRICE of the item. Remember, the bar represents BOTH the percentage AND the RETAIL PRICE at the same time. Therefore, those sections represent BOTH percentage pieces *(tens in this problem)* AND the $12.00 broken up into 10 equal pieces.

So…what is $12.00 broken up into ten equal pieces? Please don't grab a pencil and start chugging out arithmetic. Think about what happens when you multiply and divide numbers by 10. Right!

Unit 3, Lesson 2 — Grades 7-8

Math Lesson - continued

You should have discovered a pattern at some point during school much like this example:
17 x 10 = 170, 170 x 10 = 1700, 1700 x 10 = 17000, so on…

Now division:
17000 ÷ 10 = 1700, 1700 ÷ 10 = 170, 170 ÷ 10 = 17,

and 17 ÷ 10 = ???? 1.7, 1.7 ÷ 10 = 0.17, 0.17 ÷ 10 = 0.017, so on…

Now that we had a quick review of the patterns of zero's and decimals when multiplying and dividing by 10's, what is $12.00 ÷ 10??? Right! $1.20.

What does that mean for the bar? Talk to your elbow partner. Yes! That means each "chunk" has a value of $1.20. The arithmetic to figure out the dollar amount for 7 shaded chunks with values of $1.20 should be pretty easy. 7 x $1.20 = $8.40! The shaded region on our bar represents 70% of the retail price, which means
70% of the retail price = $8.40.

Didn't that sound familiar? Yes. You just verbalized the formula discussed earlier. Let's plug in our information.

We say "70% of the *(retail price)* equals *(savings)*. Numerically it is:

$$\mathbf{0.70(12.00) = \mathit{x}}$$

That is expressed as "70-hundredths of a group of 12 dollars will equal savings." However, our bar model used tenths, right? 70-hundredths is the same as 7-tenths! 0**.7 (12.00) =** ***x***

You may use a calculator now to solve for *x*, but mental math is simple enough. You want to know 7-tenths of a group of 12. Well, 1-tenth is easy enough to find. That's 1.2. So, seven groups of 1.2 = 8.4. Now make that money….$8.40! Who needs a calculator when you have math skills like that!?

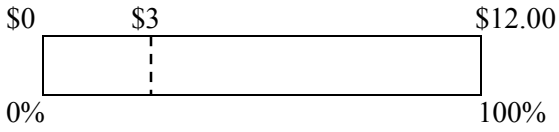
Problem 2 Teacher Notes:

Go through the steps to comprehend the problem.

- What do I know? *(retail = $12, sale price = $3)*
- What do I want to know? *(% discount)*
- Visualize. Last time we broke our bar into tenths because it was compatible with the percentage. This time we need to figure out what numbers are compatible between $12 and $3.

Math Lesson - continued

The process of labeling the bar will help students make the connection of four groups.



Help students make the connection that they can use the given $3 to determine how many times the bar can be broken up. $3 and $12 have a relationship of four. Four groups of $3 equals $12. That means I can "jump" by $3 on the bar until I reach $12... resulting in a bar that is broken up into fourths *(as shown in the picture)*. Since the bar is broken up into fourths, what is 100% divided by 4? "chunks of 25% *(label bar)*.

What does the shaded region represent? *(discount)*
What does the Unshaded region represent? *(price to pay)*
What does each fourth represent? *($3 AND 25% each)*

So, what percent was discounted? *(3 groups of 25%) = 75%*
What dollar amount does the 75% represent? *(3 groups of $3) = $9*.

Plug this information into the formula. x ($12) = $9

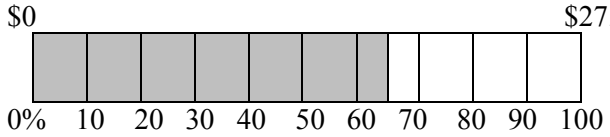
Why did we plug in $9 and not the $3 given in the problem? *(S = money SAVED, not sale price of toy.)* The shaded region represents what was saved, and that equals $9. The formula says "what percent of $12 is $9?" Walk through the steps to solve for x with the students.

Using the same thought process and strategies, work with students to solve Problems 3 and 4. The example problems in this Math Lesson demonstrate four different problem types. It is important they experience all four types.

Problem 3 Teacher Notes:

- Retail toaster price = $27.00
- Discount = 65%
- Sale price = ???

Bar model…



The bar model is broken into tenths because percents for sales are usually multiples of 5 or 10. In this case, we can think of 6-tens and half of another ten to make 65% as shown in the bar.

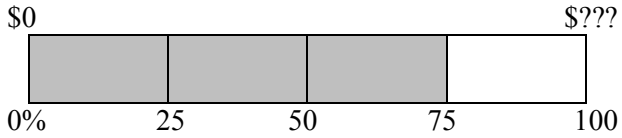
$27.00 is easily broken up into tenths at $2.70 for each "chunk" in the bar. Therefore, 6 groups of $2.70 = $16.20 plus the "half chunk" which is half of $2.70. That "half chunk" = $1.35. Put our partials together, $16.20 + $1.35 = $17.55 OFF the retail price.

OR…students can figure out the UNshaded "chunks" to quickly find the sale price. 3 chunks of $2.70 = $8.10. Then we need to deal with the "half chunk" of $1.35. $8.10 + $1.35 = $9.45.

Problem 4 Teacher Notes:

- Discount = 75%
- Sales price = $3.75
- Retail = ???

Bar model…



This bar model was broken into four sections because the discount is 75%. I can use my number sense to know that the sales price that was given to me represents the UNshaded region which is also 25% of the retail price. If I know one group, or "chunk", has a value of $3.75, then each of those sections has the same value. So, four groups of $3.75 = $15.00. The garden tool retails for $15.00.

MAS Space
What were some of the items in the Collector's Box? What did your class think about this as a collection?

Objectives
Read through the math and language objectives, making sure that students understand how they accomplished each.

Teacher Note
These four problem types not only teach the concept of percent discount, but allow students to practice their number sense and number relationship skills while working through the problems. It is important that student rationalize WHY some problems are better broken up into fourths, fifths, as opposed to tenths (and so on). Any percent problem can be broken up into tenths, but why do that if there is a more efficient way? This is a monumentally advantageous mathematical skill we want our students to possess.

Unit 3 Lesson 2 – Math Lesson
One per student

Repaired Items for Sale (1 of 4)

Work with your peers and teacher to solve these problems during the lesson.

(**Percent of Discount)** of the (**Retail Price**) gives you (**money saved**)

symbolic-mathematical representation: _____

Problem 1:
Hector repaired another stuffed toy. The retail price was $12.00 just like the stuffed toys advertisement in his circular. But he's going to give a 70% discount on the one he repaired. How much will the customer who buys his stuffed toy save?

What do you know? _____

What do you WANT to know? _____

How will the percent of discount be represented in this problem? _____

Visualize it!

Use the formula. Substitute the given information and solve for the unknown.

Final Answer: _____

Unit 3 Lesson 2 – Math Lesson
One per student

Repaired Items for Sale (1 of 4)

Work with your peers and teacher to solve these problems during the lesson.

El porcentaje de descuento (del precio de venta) te da como resultado **la cantidad ahorrada.**

Términos matemáticos: _____

Problema 1:
Héctor reparó otro muñeco de peluche. El precio de venta era de $12.00, igual que otros muñecos de peluche anunciados en el folleto de ofertas. Él va a ofrecer un 70% de descuento en este muñeco de peluche. ¿Cuánto ahorrará el cliente que compre este juguete?

¿Qué información conozco? _____

¿Qué QUIERO saber? _____

¿Cómo se representará el porcentaje de descuento en este problema?
_____

¡Visualízalo!

Usa la fórmula. **Sustituye lo que sabes y resuélvelo.**

Respuesta final: _____

Unit 3 Lesson 2 – Math Lesson
One per student

Repaired Items for Sale (2 of 4)

Work with your peers and teacher to solve these problems during the lesson.

(**Percent of Discount)** of the (**Retail Price**) gives you (**money saved**)

symbolic-mathematical representation: _____

Problem 2:
Hector read his circular and noticed the stuffed clown toy. He knew this retailed for $12.00 and saw that he priced it for sale at $3.00. He couldn't remember what discount percent he used to price the toy. Help Hector calculate the percent of discount for the clown stuffed toy.

What do you know? _____

What do you WANT to know? _____

How will the percent of discount be represented in this problem? _____

Visualize it!

Use the formula. Substitute the given information and solve for the unknown.

Final Answer: _____

Unit 3 Lesson 2 – Math Lesson
One per student

Repaired Items for Sale (2 of 4)

Work with your peers and teacher to solve these problems during the lesson.

El porcentaje de descuento (del precio de venta) te da como resultado **la cantidad ahorrada.**

Términos matemáticos: _____

Problema 1:
Héctor leyó el folleto de ofertas y vio un payaso de peluche. Sabía que se vendía por $12.00 y vio que le había puesto un precio de $3. Quería saber qué porcentaje de descuento había usado para ponerle el precio a ese juguete.

¿Qué información conozco? _____

¿Qué QUIERO saber? _____

¿Cómo se representará el porcentaje de descuento en este problema?
_____

¡Visualízalo!

Usa la fórmula. **Sustituye lo que sabes y resuélvelo.**

Respuesta final: _____

Unit 3 Lesson 2 – Math Lesson
One per student

Repaired Items for Sale (3 of 4)

Work with your peers and teacher to solve these problems during the lesson.

(**Percent of Discount)** of the (**Retail Price**) gives you (**money saved**)

symbolic-mathematical representation: _____

Problem 3:
Hector fixed a broken toaster and was ready to place it on the shelf for sale. When he researched online, he found that the toaster retailed for $27.00. He figured his toaster would sell with a 65% discount off of the retail price. What sales price does Hector need to display for the toaster?

What do you know? _____

What do you WANT to know? _____

How will the percent of discount be represented in this problem? _____

Visualize it!

Use the formula. Substitute the given information and solve for the unknown.

Final Answer: _____

Unit 3 Lesson 2 – Math Lesson
One per student

Repaired Items for Sale (3 of 4)

Trabaja con tus compañeros y maestro/a para resolver los problemas durante la lección.

El porcentaje de descuento (del precio de venta) te da como resultado **la cantidad ahorrada.**

Términos matemáticos: _____

Problema 1:
Héctor compuso un tostador dañado y estaba listo para venderse. Cuando investigó en Internet se dio cuenta de que el tostador se vendía por $27.00 en Internet. Pensó que su tostador se vendería con un 65% de descuento del precio de venta. ¿Cuál sería el precio de venta?

¿Qué información conozco? _____

¿Qué QUIERO saber? _____

¿Cómo se representará el porcentaje de descuento en este problema?
_____

¡Visualízalo!

Usa la fórmula. **Sustituye lo que sabes y resuélvelo.**

Respuesta final: _____

Unit 3 Lesson 2 – Math Lesson
One per student

Repaired Items for Sale (4 of 4)

Work with your peers and teacher to solve these problems during the lesson.

(**Percent of Discount)** of the (**Retail Price**) gives you (**money saved**)

symbolic-mathematical representation: _____

Problem 4:
Hector used a 75% discount on a garden tool to give him a sales price of $5. What was the original retail price?

What do you know? _____

What do you WANT to know? _____

How will the percent of discount be represented in this problem? _____

Visualize it!

Use the formula. Substitute the given information and solve for the unknown.

Final Answer: _____

Unit 3 Lesson 2 – Math Lesson
One per student

Repaired Items for Sale (4 of 4)

Trabaja con tus compañeros y maestro/a para resolver los problemas durante la lección.

El porcentaje de descuento (del precio de venta) te da como resultado **la cantidad ahorrada.**

Términos matemáticos: _____

Problema 4:
Héctor usó un 75% de descuento en una herramienta para el jardín y le dio un precio de venta de $5. ¿Cuál era el precio de venta regular?

¿Qué información conozco? _____

¿Qué QUIERO saber? _____

¿Cómo se representará el porcentaje de descuento en este problema?
_____

¡Visualízalo!

Usa la fórmula. **Sustituye lo que sabes y resuélvelo.**

Respuesta final: _____

Unit 3

Lesson 2 – TV Lesson – Repaired Items for Sale Problem 1 KEY

***Remember*: percent of discount** of the **(retail price)** gives you the **money saved.**

Mathematical terms: ____% (R) = S_____

Problem Number 1

Hector repaired another stuffed toy. The retail price was $12.00 just like the stuffed toys advertised in his circular. He's going to give a 70% discount on this one. How much will the customer who buys this stuff toy save?

- **What do I know?**
  - **_____$12.00 is the retail price**
  - **_____70% is the percent of discount**
- **What do I want to know?**
  - **Savings – how much will the customer save? That is our *x***
- **How will the percent of discount be represented in this problem? ___.70_____**

Visualize it!

$12.00

	70% Savings **Actual savings is *x***

Substitute what you know: ____.70 (12.00) = *x*_____ and solve it.

Use the calculator to solve the problem.

The customer will save $8.40.

Unit 3

Lesson 2 – TV Lesson – Repaired Items for Sale Problem 2 **KEY**

***Remember*: percent of discount** of the **(retail price)** gives you the **money saved.**

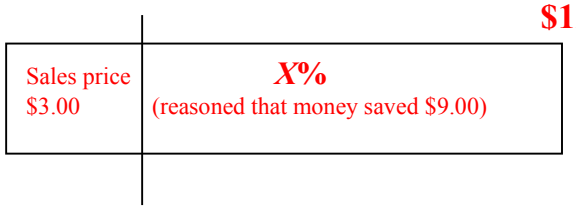
Mathematical terms: _____% (R) = S_____

Problem Number 2

Hector read his circular and noticed the clown stuffed toy. He knew this had retailed for $12.00, and saw that he had priced it for sale at $3. He wanted to know what percent of discount he had used to price that toy.

- **What do I know?**
  - **__R = $12.00_____**
  - **___Sales price = $3.00_____**
- **What do I want to know?**
  - **__Percent of Discount_____**
- **How will the percent of discount be represented in this problem? _____*x*_____**

Visualize it!



Substitute what you know: ____*x*% (12) = 9_____ and solve it.

(Solve manually to division, then use calculator) ***x* = 0.75 seventy-five hundredths = 75%**

The percent of discount is 75%.

Unit 3

Lesson 2 – TV Lesson – Repaired Items for Sale Problem 3 **KEY**

***Remember*: percent of discount** of the **(retail price)** gives you the **money saved.**

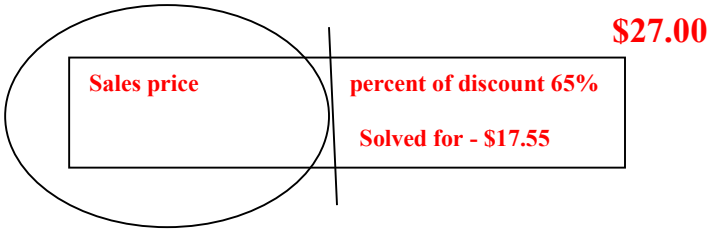
Mathematical terms: _____% (R) = S_____

Problem Number 3

Hector found a broken toaster he fixed and was ready to sell. When he researched online he found that the toaster would retail for $27.00. He thought this toaster would sell with a 65% discount of the retail price. What would the sales price be?

- **What do I know?**
  - **___Retail price = $27.00_____**
  - **___percent of discount = 65%_____**
- **What do I want to know?**
  - **__sales price_____**
- **How will the percent of discount be represented in this problem? ___.65_____**

Visualize it!



Substitute what you know: _____.65 (27) = S_____ and solve it.

Solving for "S" gives you the money saved. Subtract the money saved from the retail to find the sales prices.

The sales prices of the toaster would be $9.45

Unit 3

Lesson 2 – TV Lesson – Repaired Items for Sale Problem 4 **KEY**

***Remember*: percent of discount** of the **(retail price)** gives you the **money saved.**
Mathematical terms: _____% (R) = S_____

Problem Number 4

Hector used a 75% discount on a garden tool to give him a sales price of $5. What had been the retail price?

- **What do I know?**
  - **__75% discount_____**
  - **___$5 sales price _____**
- **What do I want to know?**
  - **__Retail price__*x*_____**
- **How will the percent of discount be represented in this problem? ___.75_____**

Visualize it!

	x
Sales price $5	**75 % discount – money saved**

Substitute what you know: _____.75 (x) – not enough data to use this equation___ and solve it.

You'll need to use real number sense here because there isn't enough data to solve using the money saved equation. We can, however, figure out the percent that the sales price represents of the retail price. QUESTION: If the discount is 75%, what percent of the retail does the sales price represent? 25% We know that the $5 represents 25% of the Retail price. Solve using .25x = $5. Work manually until you come to the division problem, then use calculator. Answer is $20

The retail price of the garden tool was $20.

Materials
- Store Circular
- **BLM** Store Circular Problems 1-2
- **BLM** Recursive Review Problems Lessons 1-3

Math Vocabulary
ratio
equivalent
rate
unit rate
percent of
discount
tip

Literature Vocabulary
swapped
traded
collector
gypsy
gypsies

ELPS (English Language Proficiency Standards - TX)
2E, 2H, 3D, 3H, 4K, 5G

Unit 3, Lesson 2 — Grades 7-8

Follow-up

Math Objectives:
- Find the amount saved when you know the percent of discount and the retail price.
- Find percent of discount when you know the retail price and sales price.
- Find sales price when you know the retail price and the percent of discount.
- Find the retail price when you know the percent of discount and the sales price.

Language Objectives:
- Discuss the various ways to find discount.
- Share ideas with students in your group.
- Explain how to use the Discount Strip to solve discount problems

Practice and Application
Listen to the explanations of how to use the discount bar model to solve percent discount problems. Be sure that all four problem types are discussed.

You might want to set up the students in teams to work together today on the assignment. Circulate the room asking questions.

QUESTIONS
- How can the discount rectangle help you visualize this problem?
- What data are you trying to find?
- Explain your strategy to me.
- *(back page assignment)* Explain your problem to me.
- Explain how the rectangle visualization can help you solve this one.

When students have finished, let them share their answers and strategies with the class.

Recursive Review
*Use **BLM** Recursive Review Problems found in Lesson 1.*

- Mr. Juarez was printing the signs for his weekly produce sales. What would a customer pay for only 1 pound of apples?

Writing Topics
Independent Writing Topic
Students will have a daily writing activity which will incorporate the day's focus math vocabulary.

- Explain how the discount rectangular bar model can help you solve this problem:

  Marty had a bag of feed. He fed 20% to his horses and still had 15 pounds left. How many pounds of feed were in the bag when he bought it?

Objectives
Review the math and language objectives to make sure that they were accomplished and that the students realize how they were accomplished.

Unit 3 Lesson 2 – Follow-up
One per student

Store Circular Problems

Work in partners or small groups to complete this activity. Select two items from the **BLM** *Store Circular and find the PERCENT OF DISCOUNT used to figure Hector's sales prices.*

Item 1: _____

Item 1: _____

Select one item from your classroom **Hector's Treasure Box.** Use the Store Circular to create your own problem to find a retail price when you know the sales price and percent discount.

Unit 3 Lesson 2 – Follow-up
One per student

Store Circular Problems

Trabaja con un compañero o un grupo pequeño para completer esta actividad. Elijan dos artículos del BLM Store Circular y busquen el porcentaje del descuento que se usaba para calcular los precios bajos de Hector.

Artículo 1: _____

Artículo 1: _____

Selecciona un artículo de la caja de tesoso de Hector en la clase. Con el BLM Store Circular, escriban su propia problema para calcular el precio original si saben el precio bajo y el porcentaje del descuento.

Materials
- 2 paper dessert plates
- 2 paper towels
- cm ruler
- 6 pieces of beef jerky

All items above per partner pair
- **BLM** Beef Jerky-Snack Fractions

Math Objectives
- Use addition, subtraction, multiplication and division to solve problems involving fractions and decimals.
- Convert between fractions, decimals, whole numbers and percents.
- Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios).
- Estimate and find solutions to application problems involving percent.

Language Objectives
- Discuss how ratios and proportions can be used to solve real-world problems.

Math Vocabulary
ratio
equivalent
rate
unit rate
percent of
discount
tip

Literature Vocabulary
swapped
traded
collector
gypsy
gypsies

Unit 3, Lesson 2 — Grades 7-8

Snack Fractions

Students should wash their hands before this activity if using food items.

Snack Fractions
Students will continue to use what they've learned about fractions, decimals, ratio and proportion to solve a few problems. Students should have the skills to answer these in small groups. Have the students work through the BLM before sharing the actual snack.

Circulate the room while students are working on the BLM, asking questions as needed to guide, redirect, extend:

QUESTIONS
- Explain one strategy for finding the approximate original dimensions if that beef shrank 15%.
- How can you find the area comparison?

Finally, let them share the jerky with a partner.

Snack Fraction Journal Writing: BLM Beef Jerky Snack Fractions
Explain how you compared the areas.

Objectives: Review the objectives with the class, making sure they understand how they achieved each.

Unit 3 Lesson 2 – Snack Fractions

One per student

Beef Jerky – Snack Fractions

What did it measure before it was dried?

Beef jerky is made from long strips of meat that that have been marinated, then dried for 6 to 8 hours in a low-heat oven or smoke house. In the drying process, the meat shrinks about 15% of the original dimensions.

Measure one strip of your half of the jerky.
long _____ cm
wide _____ cm

Using the measures above, what would the original measures (approximate) be of the beef strip used to make this particular piece of jerky? Draw a diagram of your portion and show your strategy.

How does the area of this portion of your fractional part of the snack compare to its approximate area before it was dried out? Show your work.

Unidad 3 Lección 2 –

Una por estudiante

Carne seca - Fracciones de refrigerios

¿Cuánto medía antes de secarla?

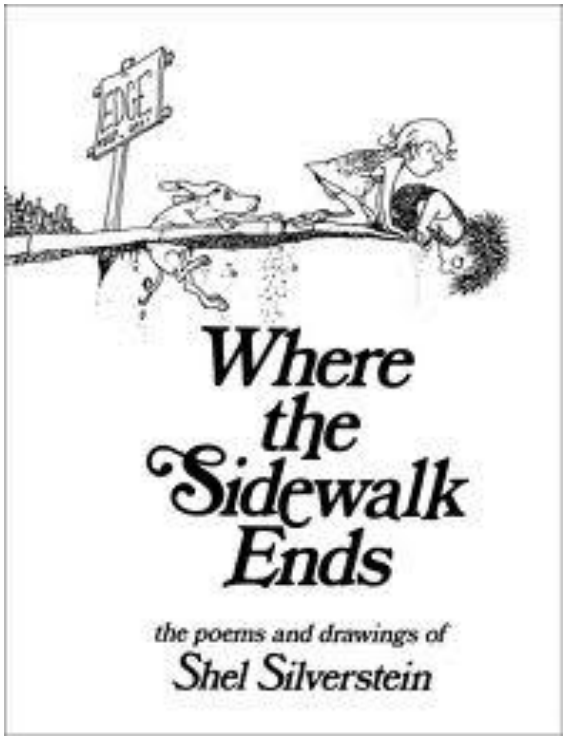
La carne seca se hace con largas tiras de carne que han sido marinadas y luego secadas de 6 a 8 horas en un horno a fuego bajo o en un ahumadero. En el proceso de secado, la carne se encoge cerca de un 15% de sus dimensiones originales.

Mide una tira de tu mitad de carne seca.
largo _____ cm
ancho _____ cm

Utilizando las medidas anteriores, ¿cuáles serían las medidas originales (aproximadas) de la tira de carne usada para hacer esta pieza particular de carne seca? Dibuja un diagrama de tu porción y muestra tu estrategia.

¿Cómo se compara el área de esta porción de tu parte fraccionaria del refrigerio con su área aproximada antes de que se secara? Muestra tu procedimiento.

Unit 3 Lesson 2 – Family Fun



Dear _____,

We read the poem *Hector the Collector* by Shel Silverstein in the book ***Where the Sidewalk Ends***.

The math ideas we used from this poem were…

_____
_____
_____
_____
_____

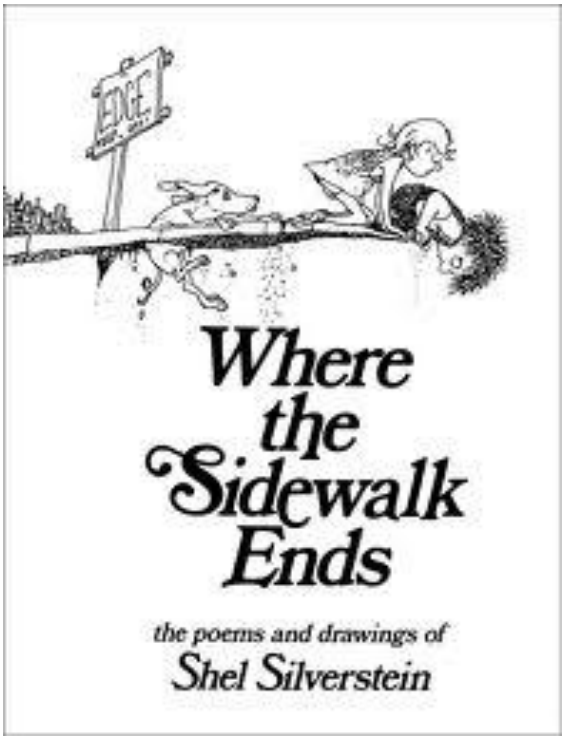
These math concepts can be used in my daily life when…

_____
_____
_____

Sincerely,

_____

Unit 3 Lesson 2 – Family Fun



Querido/a _____,

Hoy leimos el poema “Chencho lista, el colleccionista” por Shel Silverstein en el libro *Donde el camino se corta*.

Las ideas matemáticas del poema son…

_____
_____
_____
_____
_____

Estos conceptos se pueden aplicar a la vida diaria cuando

_____
_____
_____

Atentamente,

_____

Materials

- **BLM** Solve It! Problem 4-5
- **BLM** Fraction Action and *X* Marks the Spot
- **BLM** Lessons 1-3 CGI ***Where the Sidewalk Ends*** (listed in Lesson 1)

Math Objectives

- Solve word problems using a variety of strategies and defend their strategies.
- Model and solve 3-step word problems.
- Compose and decompose values to show a new representation of the value.
- Find equivalent fractions.

Language Objectives

- Speak to partners, teacher, and class using vocabulary.
- Discuss problem solving process and strategies.
- Explain how they decided to rename the target number.

Math Vocabulary

ratio
equivalent
rate
unit rate
percent of
discount
tip

Literature Vocabulary

swapped
traded
collector
gypsy
gypsies

Assessment Items

Students are introduced to and practice the skills necessary for success on the following assessment items: 1, 2, 3, 6, 9

TEKS for this Unit

7^{th} – 7.2,D; 7.3A;
8^{th} -8.2AB; 8.3B, 8.5A

ELPS (English Language Proficiency Standards - TX)
2C, 2D, 2E, 2I, 3D, 3E, 4F, 5G

Unit 3, Lesson 3 Grades 7-8

Daily Routine

The following daily activities will help prepare your students for the Post-assessment. They are not optional.

ESSENTIAL

Measurement Lab

- Lesson 1 – length
- Lesson 2 – capacity
- **Lesson 3 – omit**

Solve It! Multi-step problem solving

- Lesson 1 – threes, related problems
- Lesson 2 – pairs, 3-step problem
- **Lesson 3 – pairs, 3-step problem**

Fraction Action

- Lesson 1 – BLM Fraction Action and X Marks the Spot
- Lesson 2 – BLM Fraction Action and X Marks the Spot
- **Lesson 3 – BLM Fraction Action and X Marks the Spot**

***X* Marks the Spot**

- Lesson 1 – BLM Fraction Action and X Marks the Spot
- Lesson 2 – BLM Fraction Action and X Marks the Spot
- **Lesson 3 – BLM Fraction Action and X Marks the Spot**

CGI

- Lesson 1 – rate, measurement division
- Lesson 2 – rate, multiplication (assessment item 7)
- **Lesson 3 – price, partitive (assessment item 6)**

The following activities, although certainly developmentally appropriate for your 7^{th} and 8^{th} grade students, do not specifically address objectives assessed on the Post-assessment. Schools with shorter teaching spans can consider omitting some or all these activities as your time permits.

OPTIONAL

Target Number

- Lesson 1 – Target Number 25
- Lesson 2 – Target Number 50
- **Lesson 3 – Target Number 75**

Money Matters

(*If you have a full program and wish to use this optional activity, you will find BLMs and Explanations in the Optional Activities Tab of your Teacher's Guide*.)

Unit 3 Lesson 3 – Daily Routines - Solve It! Problems (Pairs)

One per student

Solve your own problem today, showing your work. Verify your partner's problem solution when you both finish your own. Discuss your work.

Partner #1 - Problem 4:

Lupita's party was a huge success! She decided to hire a server to tend to the buffet table and drinks so she could visit with her friends. The server charged $3.75 per guest. She had planned for 36 people but only 75% of the invited guests were there. However, 2 families brought 3 additional guests each. Lupita was so pleased with the server she gave her a 30% tip. How much did she pay the server altogether?

Problem Solution Name:	**Solution Verification** Name:

Unit 3 Lesson 3 – Daily Routines - Solve It! Problems (Pairs)

One per student

Hoy, resuelve tu propio problema, mostrando el procedimiento. Verifica la solución de tu compañero cuando ambos terminen de hacerlo por sí mismos. Hablen sobre su trabajo.

Compañero # 1 - Problema 4:

¡La fiesta de Lupita fue todo un éxito! Decidió contratar a una camarera para que sirviera la mesa del bufé y las bebidas para que ella pudiera estar con sus amigos. La camarera cobró $3.75 por invitado. Lupita había planificado que asistieran 36 personas, pero solo el 75% de los invitados estuvieron allí. Sin embargo, 2 familias llevaron 3 invitados adicionales cada una. Lupita estuvo tan satisfecha con la camarera que le dio un 30% de propina. ¿Cuánto le pagó a la camarera en total?

Solución del problema Nombre:	**Verificación de la solución** Nombre:

Unit 3 Lesson 3 – Daily Routines - Solve It! Problems (Pairs)

One per pair

Solve your own problem today, showing your work. Verify your partner's problem solution when you both finish your own. Discuss your work.

Partner #2 - Problem 5:

Lupita wanted each of her friends to leave with a little gift from the party. She found silver personalized key chains online for $13 apiece. She purchased 36 of them, but bought 8 extra (not personalized) key chains in case extra guests arrived. Since 75% of her guests attended, plus the additional 6 that tagged along with the 2 families, she had enough gifts to hand out. What did she spend on the gifts that were given out at the party? **Hint-Be careful here…Don't forget that some of the gifts are personalized, meaning their name or initials were printed on them.*

Problem Solution Name:	**Solution Verification** Name:

Unidad 3 Lección 3 – Rutinas diarias – ¡Resuélvelo! Problemas (Parejas) 

Una por pareja

Hoy, resuelve tu propio problema, mostrando el procedimiento. Verifica la solución de tu compañero cuando ambos terminen de hacerlo por sí mismos. Hablen sobre su trabajo.

Compañero # 2 - Problema 5:

Lupita quería que cada uno de sus amigos se fuera de la fiesta con un pequeño regalo. Encontró llaveros personalizados de plata en línea por $13 cada uno. Compró 36 llaveros, pero compró 8 extra (no personalizados) en caso de que fueran invitados extra a su fiesta. Dado que asistió el 75% de los invitados, más los 6 que fueron con las 2 familias, tenía suficientes regalos para entregar. ¿Cuánto gastó en los regalos que entregó en la fiesta? **Pista - Ten cuidado aquí…No te olvides que algunos de los regalos eran personalizados, es decir, tenían impresos los nombres o las iniciales*.

Solución del problema Nombre:	**Verificación de la solución** Nombre:

Unit 3 Lesson 3 – Daily Routines – Fraction Action and *X* Marks the Spot
One per student

Fraction Action

Materials:
None for this activity

Task:
Alejandro saw this sign at the market. How much would be pay for one box of his favorite snack crackers?

Today Only!!!

4 boxes for $3.00

X Marks the Spot

Solve for x in these two equations.	
$8x - 4 = 7x - 1$	$2(x - 3) + 3(x + 4) = 36$

Unit 3 Lesson 3 – Daily Routines – Fraction Action and *X* Marks the Spot
One per student

Fraction Action

Materiales:
Ningunas

Tarea:
Alejandro vio esta etiqueta en el Mercado.¿Cuánto pagariía por una caja de sus galletas favoritas?

¡¡¡Hoy!!!

4 cajas por $3.00

X Marks the Spot

Resuelve para el valor de *x* en estas ecuaciones.

$8x - 4 = 7x - 1$	**$2(x - 3) + 3(x + 4) = 36$**

Literature Selection
Where the Sidewalk Ends
(poem – THE GYPSIES ARE COMING, p 50)
by Shel Silverstein
Que vienen las gomías, p. 50

Translation note: The word "gypsy" is translated as "bogeyman." That translation is used on the Spanish cards.

Materials
- Word wall cards
- World wall map
- Pictures of real gypsies http://photobucket.com/images/gypsies/
- Family Fun Game Board (1/pair)
- Family Fun Game Cards (1/pair)
- Game markers (1/ student)
- Answer Key (1/pair)
- Game Movement Cards (1/pair)
- 4-function calculators (1/student)

Literature Vocabulary
swapped
traded
collector
gypsies
gypsy

Math Vocabulary
ratio
equivalent
rate
unit rate
percent of
discount
tip

Research
Research the origins of the Bogeyman (bogieman, boogeyman, boogieman)

Research gypsies.

ELPS (English Language Proficiency Standards - TX)
2C, 2E, 2H, 2I, 3E, 3F, 3J

Unit 3, Lesson 3 — Grades 7-8

Classroom Lesson

Every day teachers must post the objectives on the board, read them to the students, and have students read them together with the teacher. At the end of the lesson, teacher and students should review to see if they have accomplished both math and language objectives.

Math Objectives:
- Solve percent problems in a game format.

Reading Objectives:
- Compare fact and fiction.
- Infer the meaning of a poem and the author's purpose.

Language Objectives:
- Identify synonyms to increase vocabulary.
- Use different word wall words to talk about the literature you've read so far.

BEFORE READING
Building Background – Vocabulary & Literature
Fact/Fiction T-Chart activity
Ask: Did your parents ever tell you tales of a Boogieman who would come at night and take away naughty children? Or perhaps el Hombre de la Bolsa, or el Hombre del Saco? Does anyone have another fanciful character they've heard about? (Let students share.)

Explain: These characters and others like them are common characters all over the world. Why do you suppose parents would tell their children of such a character? (Accept all reasonable answers.)

Ask, "Are these characters real or make-believe?"

Add the characters students have brainstormed to the "FICTION" side of a **FACT / FICTION T-chart** (see example below).

FACT	FICTION
	Boogieman (or bogeyman) La gomía

Comprehensible Input - Vocabulary & Literature

Show students the illustration that goes with the poem "The Gypsies are Coming."

Classroom Lesson - continued

Ask, "What do you see in this picture?" *(A person carrying a sack; it looks like someone is inside the sack because there are feet sticking out.)*

Ask, "What do you think this poem will be about? Think about the characters we listed on the fiction side of our chart."

Have students make predictions with their partner, and then have a few students share with the class. Help students make connections to the FACT / FICTION chart when making their predictions.

Explain: Our poem today by Shel Silverstein is a similar tale of someone with a sack coming around gathering children. But this character is different from the ones we listed in our "FICTION" column. The character is a gypsy *(show word card)*. Does anyone know what a gypsy is? *(Accept all answers without comment.)*

Give students background information about gypsies, so that students understand that gypsies are a real group of people who live in different places around the world.

Explain: Gypsies *(show word card)* are an ethnic group found all over the world. Their 11th century ancestors probably came from India. The modern gypsies are found all over Europe. *(Have students find India and Europe on the wall map.)* These are a "nomadic" people, that is, they like to move from place to place. Although the modern gypsies originated in Europe, they have traveled all over the world. Their language is "Romani" and by some accounts there are 4 million people in Europe who speak the language, or at least one of the 7 languages considered to be Romani.

Show students pictures of gypsies that you've selected from the website, or a website of your choosing.

- What do you see when you look at these pictures?
- How are Gypsies alike/different from you?
- Would you be able to recognize a Gypsy on the street if you saw one? Why or why not?

Explain: So, gypsies are a group of people that exist in real life. This is a FACT. **But,** gypsies don't go around taking children and putting them in sacks! So, what happens in this poem is purely FICTION.

Add "gypsies" to both the FACT / FICTION side of the chart. See example below.

FACT	FICTION
Gypsies are a real group of people who live all over the world. They often move from place to place.	Boogieman (or bogeyman) *La gomía* Gypsies <u>do not</u> take away children in sacks! This is just imaginary.

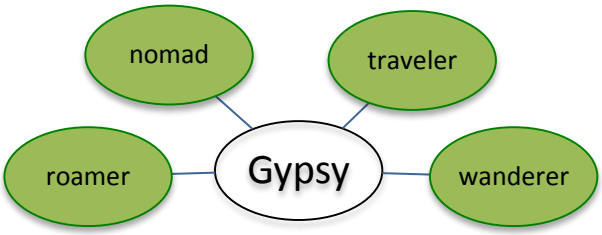
Synonym Web activity
Ask, "Can you think of any synonyms for the word *gypsy*?"

Identifying synonyms for this word may be too difficult for your students, particularly if it is a new concept for them. You can scaffold students by providing guiding questions. For example:

- We know that gypsies are people who travel from place to place. What do we call someone who travels? (*a traveler*)

- I told you that gypsies are *nomadic*, which means they move around. What do you think the noun would be for the word *nomadic?* What would you call someone who is nomadic*? (a nomad)*

After guiding students in this way to determine synonyms, your Synonym Web could look like this:



DURING READING
Comprehensible Input – Literature
For this read aloud, the goal is to support students' comprehension of the text by modeling and practicing several reading strategies:

- **Monitoring for Comprehension**
- **Inferring (including Author's Purpose)**

For this short poem, you will read it aloud without stopping, and then discuss it afterwards with students, using these two reading strategies.

Guided Reading Groups and Independent Reading Connection
If you conduct guided reading groups as part of your balanced literacy instruction, or provide time for independent reading, you can reinforce these same reading strategies.

After students have read the text on their own, to improve their comprehension of the more difficult parts:

- Monitoring for Comprehension
  When you ask students questions about the key ideas and details in the text, have them point to specific excerpts from the text. This helps students provide text evidence to support their response.

- Inferring:
  What is the author really saying in this part?

  When it says _____, what does that really mean?

  Why did the author write this? (the author's purpose)

  What message is the author giving readers?

Listening Center: Independent Reading
Let students listen to "*The Gypsies are Coming"* in a Listening Center as part of their independent reading time.

Students can also listen to other Shel Silverstein poems at his website:
http://shelsilverstein.com/html/books.asp
The website is a great way for students to read along as they listen to someone read aloud different poems and watch the animations that accompany the poems.

Classroom Lesson - continued

Have the poem displayed somewhere the whole class can see, such as written on chart paper, or projected onto a screen. If this is not possible, then pass out copies of ***Where the Sidewalk Ends*** from the classroom set right before you begin the read aloud, and have students open up to the poem "The Gypsies are Coming."

Read the poem aloud to the students.

Monitoring for Comprehension

- Teacher Question: What are the gypsies doing in this poem? Talk with your partner.

  Regroup the class and have students share. When students talk about what the gypsies are doing, help them refer to specific lines in the poem. (Ex: In line 3, it says that the gypsies are buying children and taking them children. In lines 4-8 we begin to learn that they pay different amounts of money for different children.) If students don't refer to a specific line, then after they share, ask: What line or lines from the poem gave you that information?

Inferring

- Teacher Question: Why do the gypsies pay different amounts of money for different children? Talk with your partner.

  When you regroup the class, have several students share their inferences. Remember that inferring means "reading between the lines" – students need to read between the lines to understand that certain characteristics (or traits) in children are more "desirable" than others for the gypsies, so they pay according to what traits they want in the children.

  Show students the following chart with the quantities of money, and have them refer to the poem to help you fill in the characteristics, or traits, that are worth each amount of money. See the example below. Point out to students that all of the words on the chart are adjectives. For adjectives students don't understand, give them a synonym to clarify the meaning and add the synonyms to the chart – preferably in green, as you did with the synonym web.

0¢	1¢	5¢	11¢	20¢	25¢	30¢	40¢	50¢	80¢	$1.00
bad	mean	sad	dirty	lean **thin**	weak	clean	happy	fat	husky **strong** **muscular**	meek **timid** **shy**

Beginning ELLs: Benefit from listening to these short poems. They can listen to them repeatedly to develop word recognition, and also develop their sense of rhyme in English.

Intermediate & Advanced ELLs: Benefit from listening to a poem repeatedly to develop fluency, and reading along softly when possible. Have students record themselves reading the poem aloud using the podcast tool on MAS Space. Then, they listen to that poem several times, reading along softly. When they feel they've had enough time to practice, they record themselves reading the poem again. Have students compare their two recordings to see how their fluency has improved.

Classroom Lesson - continued

ELLs: You can add a quick sketch underneath certain adjective to help ELLs understand the difference between these words.

Inferring

- Teacher Question: What kind of message is Shel Silverstein sending the reader with his last line in the poem? Talk with your partner.

Regroup the class and have several students share.

- Teacher Question: Why do you think Shel Silverstein wrote this poem? *(What is the author's purpose?)*

Synthesizing

- Teacher Question: We know that gypsies are a real group of people who live around the world. How do you think gypsies might feel about this poem? How would *you* feel if this poem were about a group of people you belong to?

After this discussion of the poem, have the class read the whole poem with you as a Shared Reading. They can do this either by looking at the poem you have displayed, or by reading from their copy of the book.

AFTER READING

Partner Reading

Have students read the poem several times with a partner. They can alternate lines or stanzas to share the reading. Each time they reread the poem with their partner, they can change who reads which lines.

Connecting Words Activity

If time permits, you may want to use a Connecting Words activity to help students review all of the word wall words they have learned so far in the unit.

Take any two words off of the word wall *(or point to any two words),* and challenge students to try to use both words in a sentence. Have students try this first with their partner, and then ask a few students to share with the class.

Variations: You can have student volunteers choose the words from the wall that they want their classmates to connect. You can also create an extra challenge by having students connect three words in a sentence, or even four words.

Unit 3, Lesson 3 — Grades 7-8

Classroom Lesson - continued

TRANSITION MATH

Building Background

Teach students the Family Fun Game during this time, omitting the problem cards that have to do with tip *(cards 11-20)*. Read the directions on the game board and special directions for 6-8.

Circulate the room asking students questions to help them with the problems:

QUESTIONS

- What do the numbers represent?
- What do you know?
- What do you need to find?
- How can you visualize this problem?
- What does your answer represent?
- Have you found your solution?
- How do you know?

When the game is over, have students discuss problems that were difficult for them. Model using the discount rectangle.

OBJECTIVES:

Review the objectives, having students tell you how they accomplished each.

Materials
- **BLM** Tipping to Save
- 4-function calculators

Math Vocabulary
ratio
equivalent
rate
unit rate
percent of
discount
tip

Literature Vocabulary
swapped
traded
collector
gypsy
gypsies

ELPS (English Language Proficiency Standards - TX)
2F, 2G, 2I, 3C, 3E, 3H, 3J

Teacher Note
Please facilitate this partner discussion – it will be short, but should be active.

Discussion
As students quickly discuss, listen to their use of the math vocabulary. Encourage proper usage.

Unit 3, Lesson 3 — Grades 7-8

Math Lesson

Math Objectives:
- Calculate tips.

Language Objectives:
- Discuss tipping and how to use percent to calculate tips.

Building Background
Another time when we use percent is in calculating a tip for someone who has performed a service for you – wait staff in a restaurant are the most frequently thought of when you think of tipping; but there are other times as well.

The whole idea of the gypsies coming and taking children away is upsetting to me; so what if we PAID the gypsy and gave her a tip on top of the payment so she would NOT take the children? That's a little far-fetched, but then so is a gypsy taking children at night in a big sack.

So, let's learn about tipping and at the same time save a few imaginary children from an imaginary person with a sack.

Comprehensible Input
To calculate a tip, you first have to know the percent you want to pay them. Take a look at the Tipping to Save sheet. First of all, I've chosen not to pay the same percent for all of the prices. Talk to a partner and decide what my pattern is. *(pause)*

You may have seen other patterns, but the scale I used was prices under 20 cents were to be tipped 15%. Prices more than 50 cents would be tipped 25%, and prices between and including 20 cents to 50 cents would be tipped 20%.

Now, let's look at the language of tipping. Let's take our first price of 50 cents. I want to tip the Gypsy 20% OF the 50 cent price.

As we saw in our other percent problems, OF is a term which translates into multiplication mathematically. So talk to your partner about how you would write an equation for 20 percent of 50 cents equals… Remember, you need to represent the percent in a way that it can be used for computation. *(pause)*

The mathematical translation is .20 (.50) =

We want to write that equation in our "tip" column on our record sheet, leaving room for the answer *(do so)*.

Now use your calculator to find the 20% tip. *(pause)*

Unit 3, Lesson 3 — Grades 7-8

Math Lesson - continued

When you multiplied on the calculator, you probably got an answer like this *(do on calculator which shows .1)*.

What does that represent? *(1-tenth)*
Is that a representation that we usually use for money? *(No, but it can be easily converted to money.)*

Money is usually represented in hundredths. What is the hundredth equivalent of one-tenth? *(10-hundredths)*

What money value does ten-hundredths or .10 represent? *(ten cents)*

OK, so a 20% tip on fifty cents is a dime, or 10 cents. That's the tip.

Now, what would we pay the Gypsy? Remember, my ideal is to pay her the price plus the tip, so what do we do now? *(add the tip to the price)*

Write the mathematical sentence for adding the tip to the price in the TOTAL column *(.10 + .50 = .60)*. So the total is sixty cents.

Let's continue
(***Complete the page, asking questions and having students respond either to a partner or to the class.)***

It seems to me that we have solved several problems.

1. We have certainly practiced calculating tips and totals.
2. We have saved many imaginary children.
3. And we have sent the Gypsy away happy with her money.

During your Follow-up Lesson you will be playing the Family Fun Game, but this time you will be using a set of cards with tipping problems on them. Be sure to read carefully – some of the questions ask you to calculate only the tip. Others ask for the total. I'm sure you will catch the difference.

MAS Space
Share with us online a time when you had to give a tip to someone, how much you tipped them, and why you gave that much.

Objectives:
Read through the math and language objectives, making sure that students understand how they accomplished each.

Teacher Note
Be sure to circulate the room, listening to the discussion and watching to see if there are students who need additional reinforcement on finding percent for tipping. You might want to pull a small group together to play the Family Fun Game with you.

Unit 3 Lesson 3 – Math Lesson

One per student

Tipping to Save

Work with your teacher and class to calculate tips and fill in the chart below.

Type	Price	% of Tip	Tip	Total
Fat ones	**.50**	**20%**		
Lean ones	**.20**	**20%**		
Dirty ones	**.15**	**15%**		
Clean ones	**.30**	**20%**		
Mean ones	**.05**	**15%**		
Husky ones	**.80**	**25%**		
Weak ones	**.25**	**20%**		
Noisy ones	**.01**	**15%**		
Meek ones	**1.00**	**25%**		
Happy ones	**.40**	**20%**		
Sad ones	**.11**	**15%**		

Unit 3 Lesson 3 – Math Lesson

One per student

Tipping to Save

Work with your teacher and class to calculate tips and fill in the chart below.

Tipos de niños	Precio	% de propina	Propina	Total
Gordos	**.50**	**20%**		
Flacos	**.20**	**20%**		
Sucios	**.15**	**15%**		
Limpios	**.30**	**20%**		
Roñosos	**.05**	**15%**		
Voluminosos	**.80**	**25%**		
Ojerosos	**.25**	**20%**		
Escandalosos	**.01**	**15%**		
Buenos	**1.00**	**25%**		
Dichosos	**.40**	**20%**		
Tristes	**.11**	**15%**		

Materials
- Family Fun Generic Game Board
- Family Fun Movement cards
- Unit 3 Family Fun-Problem Cards
- Family Fun Answer Key from Unit 1 (all grade bands)
- Unit 3 Family Fun Special 7th – 8th Game Instructions
- game markers
- 4-function calculator
- **BLM** Recursive Review Problems Lessons 1-3

Math Vocabulary
ratio
equivalent
rate
unit rate
percent of
discount
tip

Literature Vocabulary
swapped
traded
collector
gypsy
gypsies

ELPS (English Language Proficiency Standards - TX)
2G, 2I, 3D, 3E, 3G, 4F, 4G, 5G

Technology Option
Students may use a 4-function calculator to save time with calculations.

Unit 3, Lesson 3 — Grades 7-8

Follow-up

Math Objectives:
- Solve problems involving calculating tips.

Language Objectives:
- Discuss problem solving strategies with peers.
- Explain your problem solving strategy to peers.

Practice and Application
Direct students to play the Family Fun Game again, this time using the cards that involve calculating tips.

QUESTIONS
- What does this number represent?
- What does your answer represent?
- Does your solution answer the question?

Recursive Review
*Use **BLM** Recursive Review Problems found in Lesson 1.*

- Angel made a model of a B-52 Bomber with a scale of 1:144. If the actual plane measures 159 ft. long with a wingspan of 185 ft., what are the dimensions on Angel's model rounding to the nearest tenth of a foot?

Writing Topics
Independent Writing Topic
Students will have a daily writing activity which will incorporate the day's focus math vocabulary.

- **Explain how to calculate tip.**

Family Fun Game
Students will take the Family Fun game materials home to teach and play with their families.

Objectives
Review the math and language objectives to make sure that they were accomplished and that the students realize how they were accomplished.

Materials
- 2 pieces of raisin bread
- 1 banana
- 2 paper dessert plates
- 2 paper towels
- 1 plastic knife
- cm ruler

All items listed above per partner pair
- **BLM** Raisin Bread and Banana-Snack Fractions

Math Objectives
- Use addition, subtraction, multiplication and division to solve problems involving fractions and decimals.
- Convert between fractions, decimals, whole numbers and percents.
- Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios).
- Estimate and find solutions to application problems involving percent.

Language Objectives
- Discuss how ratios and proportions can be used to solve real-world problems.

Math Vocabulary
ratio
equivalent
rate
unit rate
percent of
discount
tip

Literature Vocabulary
swapped
traded
collector
gypsy
gypsies

Unit 3, Lesson 3 — Grades 7-8

Snack Fractions

Students should wash their hands before this activity if using food items.

Snack Fractions
Count the pieces of raisin bread in the loaf and write the total number of pieces on the BLM before you print the BLM.
Students will continue to use what they've learned about fractions, decimals, ratio and proportion to solve a few problems.

Students should have the skills to answer these in small groups. Have the students work through the BLM before sharing the actual snack.

Circulate the room while students are working on the BLM, asking questions as needed to guide, redirect, extend:

QUESTIONS
- What measurements do you need for your piece of bread to calculate the approximate length of the entire loaf? (*depth of the bread*)
- Explain how you will use that measure to determine the approximate length of the original loaf.
- What measurements do you need to calculate the approximate width of a loaf of raisin bread that measured the same as the world record longest loaf of bread? *(use proportions to determine the width)*

Finally, let them share the raisin bread and banana with a partner.

Snack Fraction Journal Writing: BLM Raisin Bread and Banana Snack Fractions
Explain how you calculated the width of the raisin bread if baked to 1,211.6 m and in the same proportion as your slice of raisin bread.

Family Fun Game
Students will take the Family Fun game materials home to teach and play with their families.

Objectives: Review the objectives with the class, making sure they understand how they achieved each.

Unit 3 Lesson 3 – Snack Fraction

One per student

Raisin Bread and Bananas – Snack Fractions

What would the whole loaf measure?

Your portion of the raisin bread is one piece out of _____ in the whole loaf.

Measure the dimensions of one piece of bread in centimeters.

length _____ cm
width _____ cm
height _____ cm

What would a whole loaf measure?

The record for the longest loaf of bread is 1,211.6 meters and was baked in Portugal on July 10, 2005. Using measurements from your slice of raisin bread to determine the proportion, what would the width of a loaf of raisin bread be if baked that long? (Assuming the width grew in proportion to the length.)

How does the volume of this portion of your fractional part of the snack compare to its whole approximate volume before it was cut into slices?

Unidad 3 Lección 3 –
Una por estudiante

Pan de pasas y plátanos - Fracciones de refrigerios

¿Cuánto mediría la hogaza entera?

Tu porción del pan de pasas es una pieza de _____ en la hogaza entera.

Mide las dimensiones de una pieza de pan en centímetros.
longitud _____ cm
anchura _____ cm
altura _____ cm

¿Cuánto mediría una hogaza entera?

El récord para la hogaza de pan más larga es 1,211.6 metros, y se horneó en Portugal el 10 de julio de 2005. Usando tus medidas, ¿cuál sería la anchura de la hogaza del pan de pasas si se la hornea de ese largo? (Asumiendo que la anchura crece en proporción a la longitud).

¿Cómo se compara el volumen de esta porción de tu parte fraccionaria del refrigerio con su volumen total aproximado antes de que se lo cortara en rebanadas?

Unit 3 Lesson 3 – Family Fun

Dear _____,

We learned a few more skills in math involving calculating tips!

Here are some strategies I'll need to solve the problems in this unit's game today…

_____
_____
_____
_____
_____
_____

Sincerely,

_____

Unit 3 Lesson 3 – Family Fun

Querido/a_____,

¡Aprendimos mas habilidades matemáticas en cuanto calcular propinas!

Estas son algunas de las estrategias que necesito hoy para resolver los problemas en el juego de la unidad…

_____
_____
_____
_____
_____
_____

Atentamente,

_____

This portion of the curriculum is NOT required, but should be used to supplement and enrich the Unit's activities.

Enrichment Suggestions Grades 7-8

Unit 3 ***Where the Sidewalk Ends***

Math Walk
Take your math walk to find things that the Hector the Collector could put in his collection. Have students take a picture or sketch the object. Or, if you are free to take the object *(broken, of course)*, take it to your room, being mindful to pick up things outside using something to turn it over and gloves to pick it up to avoid being surprised by anything living under the object. Clean anything you bring into the classroom before you bring it in. Display your pictures, sketches, objects in a Collection Center.

Technology Connection
- More graphing experiences: many lesson plans, some appropriate for home use. http://fcit.usf.edu/math/lessons/lessons8.html
- Cool extension problems to the ratio unit. http://math.rice.edu/~lanius/proportions/

More Curriculum Connection Ideas off the Web
- **Social Studies:** Research coins. Select one of the following questions and create a poem or poster to share your research. When did coins begin to be used? What civilization is credited for their beginning? How have coins in the USA changed since 1776. http://www.usmint.gov/kids/ http://www.livescience.com/2058-profound-history-coins.html http://www.ancienthistory.com/history.shtml
- **Science:** Did you know that there is a science to collecting? Check out the University of Oxford to find out about it. http://www.ox.ac.uk/media/science_blog/080610_1.html
- **Art:** Check out these cool artworks made from junk! Then make your own work of art from things others would throw away. http://www.noupe.com/inspiration/40-terrific-works-of-art-made-from-common-trash.html

BLM All-School Unit 3, Lesson 3 **Family Fun Game Answer Key**

Problem Letter	Kinder	1-2	3-4	5-6	7-8
A	10 apples	5 + 6 = 11	0.25, 0.55, 0.75	2.45 feet	20 % discount
B	3 lights	12 – 3 = 9	6	3.75 cups or $3\frac{3}{4}$ cups	$69.30 sales price
C	9 pies	33	35	92 feet	$4.80 saved
D	The bottom group	61	50 feet	4763.76 miles	28 lbs
E	The top group	49	3 eggs	$180.51	$498.75
F	The bottom group	43	3 bags	129.7 oz	Approx 33%
G	15	32 wild things	4 x 3 or 3 x 4	$37.60	$220.00 retail
H	7	4 wild things	There are 2 equal groups of 5 stars	$14.25	17 pounds
I	8	14 stayed	5 5/10 or 5 1/2	$11,250 earned	40% discount
J	nickel	(divide into fourths)	3.12	$456.00	$181.13 or $181.14
K	dime	There are 2 equal pieces	7 x 8 = 56 8 x 7 = 56 56 ÷ 7 = 8 56 ÷ 8 = 7	$234.06	$5.40 tip
L	quarter	9	Any model that shows 4 groups of 5 items	$14.85	$303.75 total
M	penny	6 more	10 and 5 hundredths	False, inverted ratio	$9.68 spent
N	Any set with 9 objects in it	6 fewer	Use paper and pencil to model an equivalent fraction such as 2/4, 3/6, 4/8	True, scale factor by half	$26.45 spent
O	Any set with 12 objects in it	3 were climbing	3 tenths, 0.3, is UNshaded	54 students: 1 bus	approx. 33% tip
P	These are halves	2 fewer	5 rows of 8 marks – see special instructions	36 strikes	$19.80 gratuity (tip)
Q	There are 2 equal pieces	3 + 7	First marked benchmark line – See special instructions	$\frac{1}{3}$ or $\frac{2}{6}$ or $\frac{4}{12}$	$45.80 bill before tip
R	18 objects Number card 18	6 + 7 = 13 7 + 6 = 13 13 – 7 = 6 13 – 6 = 7	Between the 0.75 and the 1, but much close to 1- See special instructions	$1\frac{2}{9}$	$575.00 total

Generic Family Fun Game Board

Materials Generic to All Units:

- Game Markers
- Game Cards for your Level
- Answer Key for your Level
- Game Movement Cards (white)
- Unit-specific Materials List

Playing the Game

1. Begin in one of the corner shapes. There may be more than one player in each starting shape. Remember where you started.
2. On your turn, draw one of your level game cards and work the problem.
3. One of the other players uses the Answer Key to check your answer. If correct, draw a movement card and move the given places
   - Forward movement in a clockwise direction.
   - Back movement in a counter clockwise direction.

   If incorrect, do not move.
4. Game is over when the first person runs the entire track, ending back on the starting shape.

Tablero de juego

Materiales genéricos para todas las unidades:

- Fichas para jugar
- Tarjetas del juego para su nivel
- Clave de respuestas para su nivel
- Tarjetas de movimiento del juego (blancas)
- Lista de materiales específicos de la unidad

Cómo se juega

1. Empiece en una de las esquinas. Puede haber más de
1 jugador en cada figura de inicio.
2. Cuando sea su turno, saque una de las tarjetas de
juego de su nivel y resuelva el problema.
3. Uno de los otros jugadores usa la clave de respuestas
para ver si su respuesta es correcta. Si es correcta, saque una tarjeta de movimiento y mueva su ficha como lo indica la tarjeta.
   - Movimiento hacia adelante en el sentido de las manecillas del reloj.
   - Movimiento hacia atrás en el sentido contrario a las manecillas del reloj.

   Si es incorrecta, no se mueve.
4. El juego se acaba cuando la primera persona recorre
toda la pista y termina en la figura de inicio.

Units 3 Lesson 3 – FAMILY FUN

One per student for home
One per partner pair in class

*Print on **goldenrod** paper.*

Family Fun – Problem Cards (1 of 2)

A. A bottle of water cost $1.25 last week. This week the water cost $1.00. What is the percent of discount for the water?	**B**. Margo wanted a DVD player. The retail price on the player was $99. This week it is on sale for 30% discount. What is the sales price of the DVD player?	**C**. Makala paid $48 for a bag of bird seed. The next week when she bought the seed, it was on sale for 10% off. How much did Makala save?
D. Sergio opened a new bag of dog food last week for his dogs. He used 25% of the food and still had 21pounds of food left. How much food had been in the full bag?	**E**. Palmer earned money on her savings account at the bank. She put $475 in the bank and didn't touch it for 1 year. If she earned 5% on her money, how much money did she have at the end of the year?	**F**. The daily blue plate special at the diner was $5.95. The dinner was also offered on the regular menu for $8.95. What is the percent of discount for the blue plate special?
G. Mr. Gregorio's Skate Shop has a skateboard on sale for $55. He has discounted that board 75%. What was the retail price on the board?	**H**. The Baker opened a new bag of flour on Monday. By Wednesday he had used 33% of the bag and there were 17 pounds left. How many pounds of flour had been in the full bag? (*Round to nearest 10th*)	**I**. Mrs. Barker read the grocery circular and saw that grapes that had been $2.00 a pound were now $1.25 a pound. What was the percent of discount for the grapes?

Units 2 Lesson 3 – FAMILY FUN

One per student for home
One per partner pair in class

*Print on **goldenrod** paper.*

Family Fun – Problem Cards (2 of 2)

J. The meal at the fancy new steak house in town cost $150.95. What would the total bill be with a 20% tip?	**K**. The meal cost $21.60. If Hannah left a 25% tip, what would the tip be?	**L**. Farrah charged $225.00 to cook for a dinner party. The hostess of the party added a 35% tip on top of the dinner charge. How much did Farrah receive for the dinner party?
M. Kristy and Carla visited over coffee at the new place called Cool Beans. Their bill was $8.42 and they left a 15% tip in the tip mug. How much did they spend at the coffee shop total?	**N**. Casey wanted to leave his barber a 15% tip. His haircut cost $23. What did he spend at the barber shop that day?	**O**. The meal cost $60. What was the percent of the tip if the guests left an additional $15?
P. An 18% gratuity is automatically added to bills for parties of 8 or more. If 10 guests ate at the restaurant together, what will be the gratuity added to their $110.00 bill?	**Q**. The 25% tip was $11.45. What was the total of the bill before the tip was added?	**R**. The Rockers paid a 15% tip of $75 for a custom paint job on the trailer that transports their band equipment. What was the cost of the paint job with the tip included?

Unidad 3

Lección 3 – Lección para el salón – Tarjetas de problemas del Juego Familiar Divertido para grados 7-8

*(Copiar en cartulina **vara de oro**. Estas son las tarjetas de problemas para grados 7-8).*

A. Una botella de agua costaba $1.25 la semana pasada. Esta semana el agua cuesta $1.00. ¿Cuál es el porcentaje de descuento del agua?	B. Margo quería un reproductor de películas DVD. El precio regular de venta del aparato era de $99. Esta semana está en oferta con un 30% de descuento. ¿Cuál es el precio de oferta del reproductor de películas DVD?
C. Makala pagó $48 por una bolsa grande de semillas para pájaros. La siguiente semana que compró las semillas, estaban en oferta con un 10% de descuento. ¿Cuánto ahorró Makala?	D. Sergio abrió una nueva bolsa de alimento para sus perros la semana pasada. Usó 25% del alimento y todavía le quedan 21 libras de alimento. ¿Cuánto alimento había en la bolsa cuando estaba llena?
E. Palmer ganó dinero en su cuenta de ahorros en el banco. Puso $475 en el banco y no lo tocó por 1 año. Si ganó un 5% de su dinero, ¿cuánto dinero tenía al final del año?	F. El platillo especial en el restaurant cuesta $5.95. El restaurante también ofrece el menú regular por $8.95. ¿Cuál es el porcentaje de descuento del platillo especial?
G. La tienda deportiva del Sr. Gregorio tiene una patineta en oferta a $55. La patineta tiene un descuento de 75%. ¿Cuál era el precio regular de la patineta?	H. El panadero abrió una nueva bolsa de harina el lunes. Para el miércoles había usado 33% de la bolsa y quedaban 17 libras. ¿Cuántas libras de harina había en la bolsa antes de abrirla? (*Redondea a la decena más cercana*)
I. La Sra. Barker leyó el folleto de ofertas de comestibles y vio que el precio de las uvas, que había sido antes de $2.00 por libra, ahora era de $1.25 por libra. ¿Qué porcentaje de descuento tenían las uvas?	J. Una cena en el restaurante nuevo cuesta $140.95. ¿Cual sería total con una propina de 20%?

Leson 3 – Lección para el salón – Tarjetas de problemas del Juego Familiar Divertido para grados 7-8

*(Copiar en cartulina **vara de oro**. Estas son las tarjetas de problemas para grados 7-8).*

K. La comida cuesta $21.60. Si Hannah dejó un 25% de propina, ¿cuánto dejó de propina?	**L. Farrah cobró $225.00 para preparer la comida para una fiesta. La anfitriona le dio una propina de 35%. ¿Cuánto recibió Farrah para preparar la comida?**
M. Kristy y Carla charlaban en la nueva cafetería Cool Beans. La cuenta salió a $8.42 y dejaron una propina de 15%. ¿Cuánto gastaron en total en la cafetería?	**N. Casey quería dejarle una propina de 15% al peluquero. El corte de pelo le costó $23. ¿Cuánto gastó en la peluquería ese día?**
O. La comida cuesta $60. ¿Cuál sería el porcentaje de la propina si dejaron $15 extra?	**P. Una propina de 18% se suma automáticamente a la cuenta para un grupo de 8 o más personas. Si 10 personas comieron en el restaurante juntas, ¿cuál sería la propina que se sumaba a la cuenta de $110?**
Q. **La propina fue $11.45. ¿Cuál fue el total de la cuenta antes de sumar la propina?**	R. Los Rockers dejaron una propina de $75 o 15% para un trabajo de pintura de encargo en el remolque que usan para transportar sus instrumentos musicales. ¿Cuál fue el costo del trabajo de pintura con la propina incluída?

Special 7th – 8th Game Instructions

Materials:

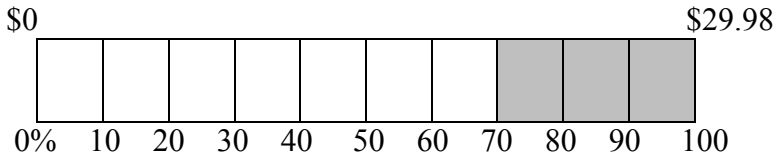
- Family Fun Generic Game Board
- Family Fun Movement Cards
- Unit 3 Family Fun Problem Cards for grades 7-8 (green)
- Family Fun Answer Key for Unit 1 (all grade bands)
- Unit 3 Family Fun Special 7th – 8th Game Instructions

Solution Expectations

Problems A – I

This card set focuses on percent of discount and price. Students may use a bar model to help them visualize the problems and figure out the answers quickly. The model can be used to find any variable in a discount problem situation.

Example: Tori saw a shirt at the store for $29.98. The clearance sign said to take an additional 30% off the ticket price. How much does the shirt cost?



The bar model shows the retail price of the shirt broken into 10 equal pieces. The shaded region represents the 30% discount. $29.98 divided by 10 groups equals $2.99. Each "chunk" equals $2.99. To find how much the shirt costs, we look at the UNshaded region. 7 groups of $2.99 equals $20.93. The shirt costs $20.93 after the discount.

Problems J – R

This card set focuses on calculating tips with percentages. The bar model above can be used for this problem set as well.

Unidad 3 Lección 3 – DIVERSIÓN FAMILIAR

Instrucciones especiales de juego para 7º – 8º

Materiales:

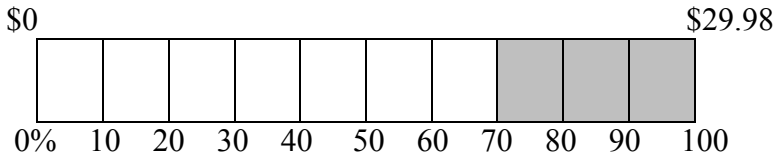
- Tablero de juego genérico de Diversión Familiar
- Cartas de movimiento de Diversión Familiar
- Cartas de problemas de Diversión Familiar de la Unidad 3 para grados 7-8 (verde)
- Guía de respuestas de Diversión Familiar para la Unidad 1 (todos los grados)
- Instrucciones especiales de juego de Diversión Familiar Unidad 3 para 7º – 8º

Expectativas de solución

Problemas A - I

Este juego de cartas se centra en el porcentaje de descuento y precio. Los estudiantes pueden usar un modelo de barra para que les ayude a visualizar los problemas y formular las respuestas rápidamente. El modelo se puede utilizar para encontrar cualquier variable en una situación de problema de descuento.

Ejemplo: Tori vio una camisa en la tienda a $29.98. El cartel de liquidación indicaba que se le quitaba un 30% adicional del precio del ticket. ¿Cuánto cuesta la camisa?



El modelo de barra muestra el precio minorista de la camisa dividido en 10 partes iguales. La zona sombreada representa el 30% de descuento. $29.98 dividido por 10 grupos es igual a $2.99. Cada "trozo" es igual a $2.99. Para saber cuánto cuesta la camisa, miramos la zona NO sombreada. 7 grupos de $2.99 es igual a $20.93. La camisa cuesta $20.93 después del descuento.

Problemas J – R

Este juego de cartas se centra en calcular propinas con porcentajes. El modelo de barra anterior, también se puede utilizar para este conjunto de problemas.

Resuelve los problemas de repaso recursivo usando cualquier estrategia que elijas.

Math Matters 2014 – In-Home Instruction

Math Objectives

Math Lesson 1

- Find ratio of single coin value to a dollar.
- Find fraction and decimal representation of single coin value out of a dollar.
- Find percent of coin value of a dollar.
- Compare the amount the SMART son had to a dollar and find the percent of a dollar for each swap.
- Find the percent of money missing from the dollar for each swap.

Math Lesson 2

- Find the amount saved when you know the percent of discount and the retail price.
- Find percent of discount when you know the retail price and sales price.
- Find sales price when you know the retail price and the percent of discount.
- Find the retail price when you know the percent of discount and the sales price.

Differentiate

Math Lesson 1 – students work with "percent of" problems

Math Lesson 2 – students find the various problem types involved with percent of discount.

Snack Fraction Notice

All snack fractions are common throughout the grade bands. All grade bands have daily snack fraction activities provided. All snack fractions for a unit in a specific grade band will practice the same set of skills. Therefore, you may choose from any of the three activities. Lesson 1, Dill Pickles is the simplest snack to transport.

Materials

Math Lesson 1

- **BLM** Fractions, Decimals, Percents

Math Lesson 2

- **BLM** Repaired Items for Sale Problems 1-4
- 4-function calculator (optional)

Family Fun

- Family Fun Generic Game Board
- Family Fun Movement cards
- Unit 3 Family Fun-Problem Cards
- Family Fun Answer Key from Unit 1 (all grade bands)
- Unit 3 Family Fun Special 7^{th} – 8^{th} Game Instructions
- game markers
- 4-function calculator

Snack Fractions (Math Lesson 1)

- 1 dill pickle
- 2 paper dessert plates
- 2 paper towels
- 1 plastic knife

All items listed above per partner pair

- **BLM** Dill Pickle-Snack Fractions

QUESTIONING
As a result of this lesson, your students should be able to respond to the following:

- What does it mean to find the "percent of" something?
- How can the discount rectangle help you visualize this problem?
- What data are you trying to find?
- Explain your strategy to me.
- Explain your problem to me.
- Explain how the rectangle visualization can help you solve this one.

Math Vocabulary
ratio, equivalent, rate, unit rate, percent of, discount, tip

CGI Problem

- All "price" problems.

Journal Writing
Explain how to find the percent of a quantity and how this relates to solving the various types of discount problems.

Family Fun
A generic game board is being used in all grade levels, differentiated by game cards specific to the grade level. Students use problem cards with discount and tip word problems.

Snack Fractions
Students divide their snack in half and calculate various percentages based on their portion.

Assessment
Students will be introduced to and practice skills for items 1, 2, 3, 7, 8, 9.

Grades 7-8 Overview

Unit 4, Lesson 1 *Spaghetti and Meatballs for All*

This is a quick snapshot of each of the three math lessons for this unit. For detailed instructions, balanced literacy objectives and enrichment ideas, refer to the complete lesson plans for each lesson.

Lesson Segment	Math Objectives	Language Objectives	Activity	Manipulatives	Supplies
Unit 4 Lesson 1 Daily Routine 30 – 45 minutes	Mid-assess summer skills	Mid-assess summer skills	**Administration of Mid-assessment**		• **Mid-assessment** 1 per student
Classroom ***Lesson 1*** 30 min. – 1 hour	Compare the perimeter to the area in specific arrays made from tiles.	Read and speak self-created sentences containing vocabulary words. Create a poster of your favorite spaghetti that includes proportions. Make predictions, give rationales, hypothesize. Classify words as parts of speech.	**Vocabulary** Use vocabulary words to write a creative paragraph. **Literature** Read literature selection and create spaghetti posters to display around the room. **Transition to Math** Investigate area and perimeter.	• 16 color tiles per pair	• class set of vocabulary cards • 9x12 manila paper 1 per pair • markers or crayons • tape • labels (nouns, verbs) • sentence strips (1 for each vocabulary word sentence) • **BLM** Mrs. Comfort's Tables • **BLM** Mrs. Comfort's Tables-Teacher Key
Math ***Lesson 1*** 30 minutes	Compare measurements of squares. Work with others to find scale factors for similar squares.	Discuss observations and measurements of shapes and their relationships. Explain scale factors to classmates. Discuss problem solving strategies with classmates. Justify answers regarding similarity among squares.	**Vocabulary** Use vocabulary pervasively in the lesson, including literature vocabulary (see suggestions in side bar of lesson). **Mathematics** Explore concepts of similarity and proportionality through the properties of squares.	• 36 color tiles per student • customary ruler	
Follow-up ***Lesson 1*** 30 min. – 1 hour	Compare measurements of squares. Work with others to find scale factors for similar	Discuss observations and measurements of shapes and their relationships. Explain scale factors to	Students continue to establish data that answers the question: "Are all squares similar?" Justify	• 36 color tiles per student	• **BLM** Recursive Review Problems Lessons 1-3

(including Snack Fractions)	squares.	classmates. Discuss problem-solving strategies with classmates. Justify answers regarding similarity among squares.	your reasoning. **Writing Prompt** What is a scale factor and how is it used?		
Snack Fractions ***Lesson 1***	Use addition, subtraction, multiplication and division to solve problems involving fractions and decimals. Convert between fractions, decimals, whole numbers and percents. Use division to find unit rates and ratios in proportional relationships such as (speed, density), price, recipes, and (student-teacher ratios). Estimate and find solutions to application problems involving percent.	Discuss how ratios and proportions can be used to solve real-world problems.	Students will work in pairs and explore fraction, decimal, and percent concepts through fair-sharing kabobs.	• 1-in cubes cooked meat (16) • 8 cubes pineapple • 8 cheese cubes • 8 cherry tomatoes • 2 paper dessert plates • 2 paper towels • 2 skewers *All items listed above per partner pair*	• **BLM** Kabob-Snack Fractions

Grades 7-8 Overview

Unit 4, Lesson 2 *Spaghetti and Meatballs for All*

This is a quick snapshot of each of the three math lessons for this unit. For detailed instructions, balanced literacy objectives and enrichment ideas, refer to the complete lesson plans for each lesson.

Lesson Segment	Math Objectives	Language Objectives	Activity	Manipulatives	Supplies
Unit 4 Lesson 2 Daily Routine 30 – 45 minutes	Solve word problems using a variety of strategies and defend strategies. Model and solve 3-step word problems. Compose and decompose values to show a new representation of the value. Find equivalent fractions.	Speak to partners, teacher, and class using vocabulary. Discuss problem solving process and strategies. Explain how they decided to rename the target number.	**Essential:** • Measurement Lab • Solve It! Problems • Fraction Action • *X* Marks the Spot • CGI **Optional:** • Target Number 15 • Graphing • Money Matters	• 36 color tiles	• **BLM** Color Tile Craziness-Measurement Lab Record Sheet • graph paper • **BLM** Solve It! Problem 1-2 • **BLM** Fraction Action and *X* Marks the Spot • **BLM** Lessons 2-3 CGI ***Spaghetti and Meatballs for All***
Classroom ***Lesson 2*** 30 min. – 1 hour	Verify similarity of objects found by classmates.	Create a poster of Silly Associations among words. Write a friendly letter. Recognize problems and possible alternative solutions.	**Vocabulary** Continue building vocabulary through lesson. **Literature** Look for problems and solutions in the story as it is being read. **Transition to Math** Students discuss findings from Lesson 1 square investigation.		• class set of vocabulary word cards • 12x18 light colored construction paper • markers or crayons • magazines for clipart • computers for clipart • scissors
Math ***Lesson 2*** 30 minutes	Compare measurements of rectangles. Work with others to find scale factors and similar rectangles.	Discuss observations and measurements of shapes and their relationships. Explain scale factors to classmates. Discuss problem solving strategies with classmates. Write solutions for finding scale factors and similar rectangles. Explain how to determine when a rectangle is similar to another rectangle.	**Vocabulary** Use vocabulary pervasively in the lesson, including literature vocabulary (see suggestions in side bar of lesson). **Mathematics** Solve problems using similarity.	• customary ruler	• **BLM** Similar Rectangle Cut-outs • **BLM** Similar Rectangles Record Sheet • **BLM** Similar Rectangles Record Sheet-Teacher Guide • scissors

Follow-up ***Lesson 2*** 30 min. – 1 hour *(including Snack Fractions)*	Compare measurements of rectangles. Work with others to find scale factors and similar rectangles.	Discuss observations and measurements of shapes and their relationships. Explain scale factors to classmates. Discuss problem solving strategies with classmates. Write out solutions for finding scale factors and similar rectangles. Explain how to determine when a rectangle is similar to another rectangle.	Play a game describing the sides of a new similar shape when the original dimensions and scale factor are known. **Writing Prompt** Explain your conclusions to the investigation for today. What is your answer to the questions, "Are all rectangles similar," and "Why do you feel that way?"	• rectangle cut-outs • dominoes (1 set per pair)	• **BLM** Similar Rectangles Record Sheet • **BLM** King of the Mountain-Game Instructions • King of the Mountain Game Board • game markers • graph paper • scratch paper
Snack Fractions ***Lesson 2***	Use addition, subtraction, multiplication and division to solve problems involving fractions and decimals. Convert between fractions, decimals, whole numbers and percents. Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios). Estimate and find solutions to application problems involving percent.	Discuss how ratios and proportions can be used to solve real-world problems.	Students will work in pairs and explore fraction, decimal, and percent concepts through fair-sharing snack bags.	• 2 paper dessert plates • 2 paper towels • 2 – 100 calorie snack bags • 2 – 4-function calculators *All items above per partner pair*	• **BLM** Snack Bag-Snack Fractions

Grades 7-8 Overview

Unit 4, Lesson 3 *Spaghetti and Meatballs for All*

This is a quick snapshot of each of the three math lessons for this unit. For detailed instructions, balanced literacy objectives and enrichment ideas, refer to the complete lesson plans for each lesson.

Lesson Segment	Math Objectives	Language Objectives	Activity	Manipulatives	Supplies
Unit 4 Lesson 3 Daily Routine 30 – 45 minutes	Solve word problems using a variety of strategies and defend strategies. Model and solve 3-step word problems. Compose and decompose values to show a new representation of the value. Find equivalent fractions.	Speak to partners, teacher, and class using vocabulary. Discuss problem solving process and strategies. Explain how they decided to rename the target number.	**Essential:** • Measurement Lab • Solve It! Problems • Fraction Action • *X* Marks the Spot • CGI **Optional:** • Target Number 45 • Graphing • Money Matters		• **BLM** Models and Designs-Measurement Lab Record Sheet • **BLM** Solve It! Problems 3-4 • **BLM** Fraction Action and *X* Marks the Spot • **BLM** Lessons 2-3 CGI ***Spaghetti and Meatballs for All***
Classroom *Lesson 3* 30 min. – 1 hour	Solve similarity problems using any strategy including scale factor and equivalent ratios.	Use a Gallery Walk as an opportunity to discuss similarities and differences between your understanding of the vocabulary words and other students' understandings. Explain how to find scale factors and use them in solving similarity problems. Analyze character traits from author's clues and illustrations.	**Vocabulary** Continue building vocabulary through lesson. **Literature** Guided gallery walk of the Silly Association posters from Lesson 2. **Transition to Math** Play game from Lesson 2.	• dominoes (1 set per pair)	• class set of vocabulary cards • **BLM** Silly Association Gallery Walk Discussion • **BLM** King of the Mountain-Game Instructions (Lesson 2) • King of the Mountain Game Board • game markers • graph paper • scratch paper
Math *Lesson 3* 30 minutes	Use any strategy to determine the dimensions of a model using a specified scale factor. Make a visual representation to help solve scale factor (model) problems.	Discuss problems solving strategies with peers. Write out solutions for solving the model problem. Explain how to make a model using a specified scale factor.	**Vocabulary** Use vocabulary pervasively in the lesson, including literature vocabulary (see suggestions in side bar of lesson). **Mathematics** Students calculate scale model measurements and test for proportionality.	• ruler	• **BLM** Thinking Smaller

Follow-up ***Lesson 3*** 30 min. – 1 hour *(including Snack Fractions)*	Use any strategy to determine the dimensions of a model using a specified scale factor. Make visual representations to help solve scale factor (model) problems.	Discuss problem solving strategies with peers. Write solutions for solving the model problem. Explain how to make a model using a specified scale factor. Write an explanation to determine whether a scale factor is for enlarging or reducing an object.	Students work in teams to solve the Thinking Smaller, Sears Tower sheet. Continue the recursive review problems, modeling another problem before circulating the room to assure students understand the problems and how to set up ratios. **Writing Prompt** Explain how you can know whether you are reducing or enlarging a figure by looking at the scale factor.		• Sears Tower article • **BLM** Thinking Smaller-Sears Tower • Family Fun Generic Game Board • Family Fun Movement cards • Unit 4 Family Fun-Problem Cards • Family Fun Answer Key from Unit 1 (all grade bands) • Unit 4 Family Fun Special 7^{th} – 8^{th} Game Instructions • game markers • **BLM** Recursive Review Problems Lessons 1-3
Snack Fractions ***Lesson 3***	Use addition, subtraction, multiplication and division to solve problems involving fractions and decimals. Convert between fractions, decimals, whole numbers and percents. Use division to find unit rates and ratios in proportional relationships such as (speed, density), price, recipes, and (student-teacher ratios). Estimate and find solutions to application problems involving percent.	Discuss how ratios and proportions can be used to solve real-world problems.	Students will work in pairs and explore fraction, decimal, and percent concepts through fair-sharing crackers and cream cheese.	• 3 graham crackers (whole sheets) • 2T cream cheese • 2 paper dessert plates • 2 paper towels • 2 plastic knife *All items above per partner pair*	• **BLM** Crackers and Cream Cheese-Snack Fractions

Project SMART/Math MATTERS 2014

Grade Level: 7-8	Unit 4 / Lessons 1 – 2 – 3

Daily Routine Math Objectives:
Solve word problems using a variety of strategies and defend strategies.
Model and solve 2 and 3-step word problems.
Compose and decompose values to show a new representation of the value.
Solve problems involving ratios, proportions, and similarity.

Daily Routine Language Objectives:
Listen, read, speak, and write the problem.
Listen to, read, speak and write about measurement vocabulary.
Speak to partners, teacher, and class using vocabulary introduced in the Daily Routines.

Unit Math Objectives:
Make observations and measurements regarding specific shapes and their relationships to one another.
Verify that all squares are similar.
Compare measurements of rectangles.
Work with others to find scale factors and similar objects (including rectangles).
Solve similarity problems using any strategy including scale factors and equivalent ratios.
Use any strategy to determine the dimensions of a model, using a specified scale factor.
Make visual representations to help solve scale factor (model) problems.

Unit Language Objectives:
Use a Gallery Walk as an opportunity to discuss similarities and differences between your understanding of the vocabulary words and other student's understandings.
Explain how to find scale factors and use them in solving similarity problems.
Analyze character traits from author's clues and illustrations.
Discuss problem solving strategies with classmates.
Write out solutions for finding scale factors and similar objects.
Explain how to determine when objects (including rectangles) are similar and when they are not similar.
Discuss examples and non-examples of similar objects.
Write about scale factors and how they are used.
Create a poster of Silly Associations among words.
Write a friendly letter.
Recognize problems and possible alternate solutions.
Discuss the use of scale factors and models used by architects, engineers, etc.
Explain how to find scale factors and how to use them in solving similarity problems.
Write a creative sentence using several vocabulary words.
Explain how to make a model using a specified scale factor.
Write an explanation to determine whether a scale factor is for enlarging or reducing an object.

Technology Objectives:
Use research skills and electronic communication, with appropriate supervision, to create new knowledge.

Vocabulary
Math: scale factor, similarity, similar, proportion, ratio
Language: comfort, tending, stretched, reunion, banquets, balancing, arrival, relatives

Resources/Literacy Links
Spaghetti and Meatballs for All
by Marilyn Burns

Lesson Sequence

- Daily Routine: 30 – 45 minutes
- Classroom Lesson: 30 minutes - 1 hour
- Math Lesson: 30 minutes
- Classroom Follow-up including Independent Writing: 30 minutes - 1 hour

Enrichment Activities – These are BEYOND EXPECTATION

Math Extensions:

Fraction/Decimal/Percent games:
http://www.bbc.co.uk/skillswise/numbers/fractiondecimalpercentage/comparing/comparingall3/index.shtml
http://www.quia.com/jg/65724.html

Strand Extensions:

- **Social Studies:** History of spaghetti
  http://www.online-gourmet-foods.com/history-of-spaghetti.html
  http://www.bestofsicily.com/mag/art73.htm
  http://www.inmamaskitchen.com/FOOD_IS_ART/pasta/historypasta.html
- **Science:** Physical changes in spaghetti from raw to cooked - science experiments
  http://www.gk-12.osu.edu/Lessons/4th%20Grade/Spagetti%20Physical%20Change.pdf
  http://www.ehow.com/info_7966876_spaghetti-science-activities.html
- **Art:** Pasta Art
  http://tlc.howstuffworks.com/family/pasta-crafts1.htm

Technology:

Applet to SMART board for this literature book:
http://exchange.smarttech.com/search.html?q=%22literature%22
Online geometry resizing tool: http://www.mathsisfun.com/geometry/resizing.html
Recipe for healthy Almond Joy bar: http://www.healthyindulgences.net/2009/01/almond-joy-of-cooking.html
Mini Unit on writing a friendly letter: http://abcteach.com/_Writing/FLinfo.htm
Mini Unit on character analysis:
http://homeworktips.about.com/od/writingabookreport/a/characteranalysis.htm
http://www.funattic.com/game_flingsock.htm#anchor349698
Walk – Art Walk: http://entertainment.howstuffworks.com/paintings-by-gustave-caillebotte2.htm

Unit 4 Writing Workshop 

1. Genre: Memoir

2. Writing Objective: Students write a memoir about their experiences as a new arrival. *(To the United States; to the town they're currently in; to the school, etc.)*

- Organization of text:

The memoir is a narrative text relating certain life experiences. In this case, it is what students experienced as a new arrival to a particular place. This can be a powerful way for students to tell their immigrant/migrant story. The memoir can narrate what students experienced, how they felt, how the experiences changed them, how it changed their families, etc.

- Possible sequence of mini-lessons:

1. Brainstorm: Talk with students about how they learned the word *arrival* from ***Spaghetti and Meatballs for All***. An arrival is a person who has just arrived somewhere. Explain how everyone in the classroom has been a new arrival at some point – a new arrival to the United States, to the town they're currently in for the summer, to the school they are at this summer, etc.

   Explain that this week they will have the chance to write a memoir – the story of their lives – focusing on when they moved and became a new arrival somewhere. The memoir can tell each of their personal immigrant/migrant stories. It is a way for them to tell what they have experienced, how it felt being in that situation, how it changed them and their families, etc. Some of the students' experiences might be similar to each other, and others will be very unique.

   Give students a chance to share with the class some of the things they experienced as a migrant – as a new arrival. If students are reluctant at first to share, ask specific questions to get them started. Continue asking questions to help them share more details about what they experienced. As more students share, more students will want to build off of what their classmates said, sharing similar experiences or emotions. The more time you spend having students share, and asking questions to dig deeper into their experiences, the more detailed ideas they will have for writing their memoirs. Have students tell specific stories to illustrate certain experiences/emotions they mention. (The power of a memoir is in the personal details the author includes.)

2. Draft: Model for students how to begin drafting a memoir. Remember, this is a narrative, so you can include narrative elements such as dialogue, descriptive language, and sequential story telling.

3. Revise: Once students have an initial draft, put students in small groups to have them share their writing with their peers. Model how they should take turns reading their memoirs aloud to the small group and then get feedback. Model how the feedback should first mention something they like about the student's writing, and then a question they have to clarify a certain part, or a comment they have about how the student could add more detail to a certain part. It is essential to model this small group process for students so they can give helpful feedback to their peers.

4. Publish: Have students create a final version of their memoirs, based on any changes/additions they made to their writing from the feedback they received. You may want to have students share their memoirs at a writing celebration, inviting families to join.

Materials
- Mid-assessment

Math Objectives
- Mid-assess summer skills.

Language Objectives
- Mid-assess summer skills.

Math Vocabulary
scale factor
similarity
similar
proportion
ratio

Literature Vocabulary
comfort
tending
stretched
reunion
banquets
balancing
arrival
relatives

Unit 4, Lesson 1 — Grades 7-8

Daily Routine

Mid-assessment – The Daily Routines have been omitted to accommodate the administration of this tool. Please be sure to give the assessment as per the instructions under the Assessment Tab in your Teacher's Guide.

The following daily activities will help prepare your students for the Post-assessment. They are not optional.

ESSENTIAL

Measurement Lab
- **Lesson 1 – omit**
- Lesson 2 – area
- Lesson 3 – similar figures

Solve It! Multi-step problem solving
- **Lesson 1 – omit**
- Lesson 2 – pairs, 3-step problem
- Lesson 3 – pairs, 3-step problem

Fraction Action
- **Lesson 1 – omit**
- Lesson 2 – BLM Fraction Action and X Marks the Spot
- Lesson 3 – BLM Fraction Action and X Marks the Spot

***X* Marks the Spot**
- **Lesson 1 – omit**
- Lesson 2 – BLM Fraction Action and X Marks the Spot
- Lesson 3 – BLM Fraction Action and X Marks the Spot

CGI
- **Lesson 1 – omit**
- Lesson 2 – rate, multiplication (assessment item 7)
- Lesson 3 – price, partitive (assessment item 6)

Assessment Items As a result of this unit, students will be prepared for the following assessment items: 2, 3, 4, 5, 6, 7 **TEKS for this Unit** 7th – 7.2D, 7.3B, 7.4B 8th – 8.2D, 8.6AB	**Unit 4, Lesson 1** **Grades 7-8** **Daily Routine** - continued  **----------** **The following activities, although certainly developmentally appropriate for your 7th and 8th grade students, do not specifically address objectives assessed on the Post-assessment. Schools with shorter teaching spans can consider omitting some or all these activities as your time permits.** **----------** **OPTIONAL** **Target Number** • **Lesson 1 – omit** • Lesson 2 – Target Number 15 • Lesson 3 – Target Number 45 **Money Matters** (*If you have a full program and wish to use this optional activity, you will find BLMs and Explanations in the Optional Activities Tab of your Teacher's Guide*.)

Unit 4 Lesson 2-3 – Daily Routines - CGI Problems
One per student

CGI – *Spaghetti and Meatballs for All*

	Multiplication	**Measurement Division**	**Partitive Division**
Grouping/ Partitioning	Mr. Comfort had 2 1/2 pounds of meat from which he used to make the meat sauce for his spaghetti. Each pound cooked out about 4 ounces of fat. Approximately how many ounces of fat were cooked out of the meat?	There were 16.05 pounds of spaghetti for Mr. Comfort to cook for the banquet. If he wanted each of his relatives to have about half a pound, how many relatives could he serve? (Hint: a pound equals 16 ounces.)	Mr. Comfort shared 128 meatballs among 32 guests at the reunion. How many meatballs did each guest receive?
Rate	Mr. Comfort can make 15 meatballs in a minute. At that rate, how many meatballs can he make in 30 minutes?	Mr. Comfort can make 15 meatballs in one minute. At that rate, how long would it take him to make 120 meatballs?	Mr. Comfort stretched his strength and made 1800 meatballs in 15 minutes. If he made them at a constant rate, about how many meatballs did he make in one minute?
Price	A head of Romaine lettuce cost $2.49. If Mr. Comfort bought 16 heads of lettuce, how much did he pay for the lettuce?	Mr. Comfort calculated that each salad costs $2.80 to serve. If he spent $84.00 on the salads, how many salad servings did he prepare?	Mr. Comfort spent $97.50 on salad ingredients for the banquet. If he served a total of 30 relatives, how much did each serving cost?

Unit 4 Lesson 2-3 – Daily Routines - CGI Problems
One per student

CGI – *Spaghetti and Meatballs for All*

	Multiplicación	**División de medida**	**División partitiva**
Agrupación/ Partición	El Sr. Comfort tenía 2 1/2 libras de carne, de las que usó para hacer la salsa de carne para el espagueti. De cada libra se cocinaron aproximadamente 4 onzas de grasa. ¿Aproximadamente cuántas onzas de grasa se cocinaron de la carne?	Había 16.05 libras de espagueti para que el Sr. Comfort cocinara para el banquete. Si quisiera que cada uno de sus parientes recibiera cerca de media libra, ¿a cuántos parientes les podría servir? (Pista: una libra equivale a 16 onzas).	El Sr. Comfort compartió 128 albóndigas entre 32 invitados en la reunión. ¿Cuántas albóndigas recibió cada invitado?
Tasa	El Sr. Comfort puede hacer 15 albóndigas en un minuto. A esa tasa, ¿cuántas albóndigas puede hacer en 30 minutos?	El Sr. Comfort puede hacer 15 albóndigas en un minuto. A esa tasa, ¿cuánto tiempo le llevaría hacer 120 albóndigas?	El Sr. Comfort excedió sus fuerzas e hizo 1800 albóndigas en 15 minutos. Si las hizo a una tasa constante, ¿aproximadamente cuántas albóndigas hizo en un minuto?
Precio	Una planta de lechuga romana cuesta $2.49. Si el Sr. Comfort compró 16 plantas de lechuga, ¿cuánto pagó por la lechuga?	El Sr. Comfort calculó que cada ensalada cuesta $2.80 para servir. Si gastó $84.00 en las ensaladas, ¿cuántas porciones de ensalada preparó?	El Sr. Comfort gastó $97.50 en ingredientes para la ensalada para el banquete. Si le sirvió a un total de 30 parientes, ¿cuánto costó cada porción?

Materials
- class set of vocabulary cards
- 9x12 manila paper 1 per pair
- markers or crayons
- tape
- labels (nouns, verbs)
- Sentence strips (1 for each vocabulary word sentence)
- 16 color tiles per pair
- **BLM** Mrs. Comfort's Tables
  BLM Mrs. Comfort's Tables-Teacher Key

Literature Selection
Spaghetti and Meatballs for All
by Marilyn Burns

Math Vocabulary
scale factor
similarity
similar
proportion
ratio

Literature Vocabulary
comfort
tending
stretched
reunion
banquets
balancing
arrival
relatives

ELPS *(English Language Proficiency Standards):*
2D, 2H, 2I, 3D, 3E, 4G, 4J, 5B

Technology Option
Great use for SMART board!

Unit 4, Lesson 1 — Grades 7-8

Classroom Lesson

Every day teachers must post the objectives on the board, read them to the students, and have students read them together with the teacher. At the end of the lesson, teacher and students should review to see if they have accomplished both math and language objectives.

Math Objectives:
- Compare the perimeter to the area in specific arrays made from tiles.

Reading Objectives:
- Determine the meaning of words using context clues.
- Describe how characters respond or change as the plot moves toward a resolution.

Language Objectives:
- Use vocabulary words to discuss a story.
- Match definitions with vocabulary words.

BEFORE READING
Building Background – Literature & Vocabulary
Show students the cover of the book. Ask them to discuss what they see. Draw attention to the subtitle "A Mathematical Story" and to the cover illustration. How might this story involve mathematics?

Comprehensible Input - Vocabulary
Explain: This is a story about a husband and wife – Mr. and Mrs. Comfort (*point to them on the cover*) who decide to invite their relatives to a family reunion.

Write the following sentence somewhere the entire class can see:

> Mr. and Mrs. **Comfort** decide to invite their **relatives** to a family **reunion.**

Talk with students about the meaning of the three bold literature vocabulary words. You can ask:
- What does *comfort* mean? Why might the author choose this last name for the characters? *(What might it symbolize about the kind of people they are?)*
- Who are *relatives? (Help students understand that* ***relatives*** *can mean* <u>any</u> *family member.)*

- What is a *reunion*? Have you ever had a family reunion? Perhaps when you returned home after being away for the summer?

Matching Activity – Part 1
Place the three word cards on the word wall. Add to the word wall the student-friendly definitions for these words *(not in order)* – see **BLM Student-Friendly Definitions**. Have students talk with a partner to discuss which definition describes which word.

Regroup the class and have students come up to the word wall to correctly match the definitions with the words. Your word wall should look like this:

comfort	To make someone feel better

relatives	People in your family

reunion	A get-together for people who haven't seen each other for awhile

Vocabulary Predictions activity
This activity helps students preview the five remaining literature vocabulary words in a meaningful way. You will show students a short list of words, and students predict which ones they think will be in this story, based on what they see on the cover.

- Tell students: The three words we have on our word wall so far are all in the story ***Spaghetti and Meatballs for All***. Here is a short list of some other words you **might** be hearing in this story today.

  (Five of the words are the literature vocabulary words; two are extra words that are NOT in the story: ***ice cream*** *and* ***fight****).*

Classroom Lesson - continued

arrival

ice cream

stretched

fight

tending

balancing

banquet

- Read aloud the list of words to students. Ask, "Which of these words do you think will be in ***Spaghetti and Meatballs for All***?" Make predictions with your partner. **Note:** Don't tell students the meaning of the words just yet! You want to use their discussion time to assess what they already know about these words.

- Have students share their predictions with their partner, discussing why they think each word will or will not be in the story. If students don't know what certain words mean, that is OK. Circulate during this talk time, taking mental note of the words students don't understand.

- Regroup the class. For each word, ask students to give a thumbs-up if they think the word will be in the text; then ask students to give a thumbs-down if they predict the word will not be in the text. Call on one or two students to share why they made that prediction.

- Tell students that as you read the story, if they hear any of the words from the list, they should give a thumbs-up sign. They will find out if their predictions are correct, and they will figure out what each word means!

DURING READING

Comprehensible Input - Literature

For this read aloud, the goal is to support students' comprehension of the text by modeling and practicing two reading strategies:

1. **Monitoring for Comprehension**
2. **Determining Word Meaning**

This section indicates places in the text where you can:

- Briefly pause to model a reading strategy by thinking aloud.
- Briefly pause to have students practice a reading strategy by answering a question you pose.

Keep in mind that pausing the reading for too long at any of these places will make the reading very disconnected. This interferes with

Technology Option
Students could create their arrays in Word graphic tools or KidPix.

Applet to SMART exchange is available for this book. Membership is free.
http://exchange.smarttech.com/search.html?q=%22literature%22

Guided Reading Groups and Independent Reading Connection

If you conduct guided reading groups as part of your balanced literacy instruction, or provide time for independent reading, you can reinforce these same reading strategies.

After students have read the text on their own, to improve their comprehension of the more difficult parts:

1. Monitoring for Comprehension: You can continue to have students think about how different characters respond to a problem, and how they change as the story moves towards a resolution. You can also ask students questions about the resolution:
   a. Was the problem resolved? How?
   b. Were there other problems that weren't resolved?

2. Have students point to specific excerpts from the text to provide evidence to support their responses.

3. Determining Word Meaning: "What does _____ mean?" *(Reread the sentence. Does it give us any clues? Read the next sentence(s) or previous sentence(s). Do they give us any clues?)*

Classroom Lesson - continued

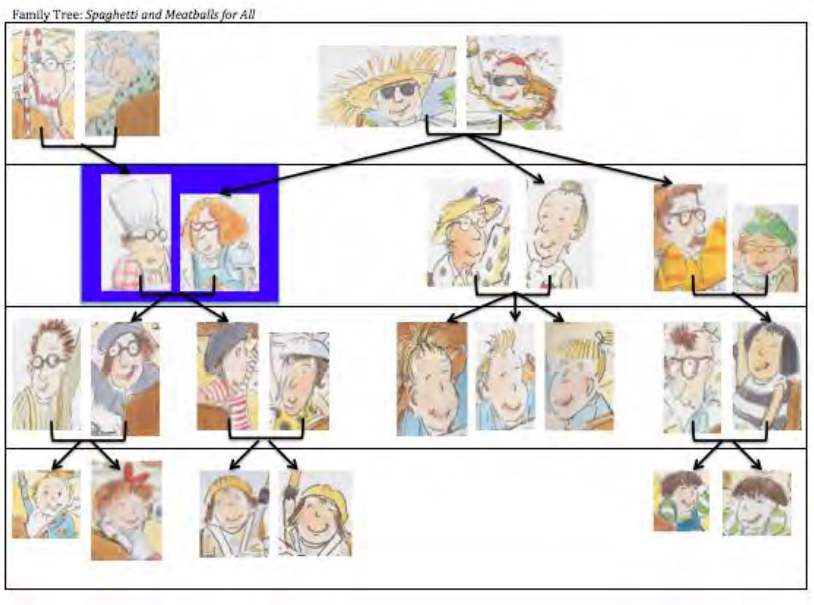
students' comprehension and enjoyment of the text, so keep the reading as fast-paced as possible.

You may want to mark the following stopping points in the text with sticky notes, indicating what you will say to students.

Throughout the Reading: Monitoring for Comprehension

There are so many characters in this story that it quickly becomes confusing even for English-proficient readers. To complicate this further, the author refers to the characters by their relation to Mr. and Mrs. Comfort *(Ex: Mrs. Comfort's brother's wife)*. To clarify who is who in a visual way, you can display the **BLM Family Tree**, which shows how all of the characters are related**.** As you read the story and new characters arrive to the reunion, point them out on the Family Tree *(image shown here)*. You may want to cover up each character with a small sticky note until they appear in the story, and then reveal them. That makes the Family Tree less overwhelming, and helps focus students' attention. You may also want to enlarge the Family Tree or project it on a screen to enlarge the image.

ELLs: You may need to explain to ELLs the possessive "s" used to indicate family relations *(Mrs. Comfort**'s** daughter)*. The apostrophe is used in English to show that something or someone belongs to the subject. Relate this to Spanish, which uses the preposition "de" *(La hija **de** Mrs. Comfort)*. You can label the family tree with the characters' names, so students can SEE how this is used.



Listening Center: Independent Reading
You can record ***Spaghetti and Meatballs for All***, and let students listen to it in a Listening Center as part of their independent reading time.
Beginning ELLs: Benefit from listening to a text repeatedly to connect oral and written language.
Intermediate & Advanced ELLs: Benefit from listening to a text repeatedly to develop fluency, and reading along softly when possible. Using the podcast tool on MAS Space, have students choose their favorite page(s) and record themselves reading that part aloud. Then, they listen to that particular part several times, reading along softly. When they feel they've had enough time to practice, they record themselves reading that page again. Have students compare their two recordings to see how their fluency has improved.

Unit 4, Lesson 1 — Grades 7-8

Classroom Lesson - continued

p. 1 "One fine day…"
Determining Word Meaning

- Teacher Think Aloud: I saw many of you give the thumbs-up sign. What words did you hear? *tending, stretched, banquet.* Let me read this page again, and make sure we understand what each word means.
  - Tending: She is tending the lettuce in her garden –In the picture we can see how she is taking care of the lettuce, so I think *tending* means taking care of something.
  - Stretched: I can figure out what this word means because I can see how Mr. Comfort is extended on the bench. *(Act out **stretched**.)*
  - Banquet: Many of you thought this word would be in the story. Mr. Comfort is looking at a cookbook for recipes that serve banquets – that must mean a meal for a large group of people – not just two or four people like the other recipes. He wants to know how many people are coming, to decide if they need to serve a banquet, or a smaller meal.

p. 7 "Mrs. Comfort found a folding chair…"
Determining Word Meaning

- Teacher Question: Some of you gave the thumbs-up sign – you heard the word *balancing*. Let me read that sentence again. Show me what *balancing* means, based on what you heard in this sentence. *[Have students act out.]*

p. 11 "You're so right," Mr. Comfort said.
Monitoring for Comprehension

- Teacher Question: *(after reading the page)* Why does Mrs. Comfort keep saying that it won't work? What is the problem?

p. 13 "Save some of that garlic bread for me!"
Determining Word Meaning

- Teacher Question: Did anyone catch the vocabulary word here? Let me read the first sentence again. What does *arrival* mean? Talk with your partner.

p. 25 ""Wait! Wait!"
Monitoring for Comprehension

- Teacher Think Aloud: The problem just keeps getting worse! No one is listening to Mrs. Comfort, and she is the only one who knows that the tables have to be arranged a specific way so all of the relatives have a place to sit.

- Teacher Question: How is Mrs. Comfort changing as the problem gets worse? Talk with your partner.

Classroom Lesson - continued

Circulate to listen in to a few partners' discussions, and then regroup the class. Have a few students share. Emphasize the fact that characters change throughout a story. Here, Mrs. Comfort is showing that she is getting increasingly frustrated.

p. 29 "I say we divide the four pairs of tables…"
Monitoring for Comprehension

- Teacher Question**:** Mr. Comfort says that "it all worked out" and that he knew Mrs. Comfort would "think of something." Was Mrs. Comfort the one who solved the problem? How was the problem resolved? Talk to your partner.

  Listen in to partners' discussions, and then regroup the class. Have students share with the class, and make sure students correctly understand the resolution and how each character responded to this resolution.

Evaluation

- Teacher Question: What would you have done if you were Mrs. Comfort?

Launch Unit 4 Writing Workshop:
Students write a **memoir** about their migrant experiences – telling the story of when they were a **new arrival** (to the United States; to the town they're in this summer; to the school). In their memoir, students can reflect on their migrant experiences and being a new arrival, how they felt, and how it has affected them.
See Writing Workshop in Balanced Literacy Extensions for an outline of possible.

AFTER READING

Matching Activity – Part 2
Display the five vocabulary words that appeared in the story on the word wall, and identify the two words from the list that were not in the story: *ice cream* and *fight*. You can discuss with students how the family didn't fight, but Mrs. Comfort got very frustrated.

Show students the **BLM Student-Friendly Definitions** for the five new words, in a mixed-up order. Have students work with a partner to decide which definitions belong with which word. At the end of the matching activity, your word wall will look like the following example:

comfort	To make someone feel better
relatives	People in your family

Classroom Lesson - continued

reunion	A get-together for people who haven't seen each other for awhile
tending	To care for something
stretched	To extend something that is flexible
banquet	A formal meal for many people
balancing	To keep something in a steady position so it won't fall
arrival	A person who has arrived (come)

Language Center
Throughout the week, you can have students independently create Visual-Verbal Word Association charts for different literature vocabulary words from this unit, and add the charts to their binders. Students can copy the student-friendly definitions from the word wall for that part of the chart.

Math Connection: Proportions activity
Ask, "How many of you like spaghetti? What is your favorite sauce? Meat sauce? Marinara? Alfredo? Do you like meatballs with it? What about cheese? Do you want Parmesan cheese sprinkled or grated on it?"

Explain: I would like for you and a partner to get together and create a poster *(9 x 12 construction paper and markers/crayons)* of a bowl of your favorite spaghetti. You only have about seven minutes, so get together and get going!

(After seven minutes) Explain: Now, I would like for you to think for a moment about your favorite recipe. What would you say are the ideal PROPORTIONS of sauce to spaghetti to meatballs? Note those proportions creatively on your posters.

When you are done, we will post them around the room and be surrounded by Spaghetti and Meatballs from all of you!

Technology
Students could create their arrays in Word graphic tools or KidPix.

Applet to SMART exchange is available for this book. Membership is free.
http://exchange.smarttech.com/search.html?q=%22literature%22

Distribute Materials
- Color tiles – 8 per student
- **BLM** – Mrs. Comfort's Tables

Shared across grade bands

Pirate's Corner
What are some of the math skills you have learned so far this summer that you either didn't know before or that you were not comfortable with before?

Unit 4, Lesson 1 — Grades 7-8

Classroom Lesson - continued

Transition to Math

During the math portion of our lesson we are going to be investigating area and perimeter. The Math Lesson will be delving into ratio and proportion, taking a little different perspective on the story.

We are going to be looking at the arrangements of Mrs. Comfort's tables. What were the table arrangements in the book?

How many tables did Mrs. Comfort order? *(8)*

Eight groups of one table – we can represent that with eight separate ONE color tiles. *(Demo with color tiles and have students do the same.)* Let's record on our record sheet as we go.

- First, write the description and draw the picture in the first column *(do so as per TEACHER KEY)*.
- What does the label on the next column ask? *(perimeter of one group)*
- We can look at these tables as eight groups of one. What is the perimeter of one table? *(4 units)*
- The next column label is area – what is area*? (the part of the shape inside the perimeter)* Well, if we consider one table tabletop to be ONE area, then what area does one group have? *(1 square unit or 1 unit^2)*
- The next column requires us to figure the total perimeter of the groups. What is the total area of all of the groups? Eight tables times four unit perimeter on each equals 32 units.
- The next column requires us to figure the total area of the groups. So what is the total area of all eight groups? *(8 square units or 8 units^2)*
- Capacity, then, of the single tables is what? *(If one person sits at each side, then 32 people can be seated with this configuration.)*
- Finally, an extension column. This column allows us to add within the column to the left of it if need be. We don't have two figures in this column, so our extension is the same as the previous column, or 32 people.

What was the second arrangement?

Unit 4, Lesson 1 — Grades 7-8

Classroom Lesson - continued

Two tables were pulled together – that makes a 2 x 1 array and is arranged like this.

So that left how many single tables? *(6)*
(*Repeat process, having students model and record. Notice that each GROUP is counted. As tables are pulled together, they are considered a single group. So in this case you have the 2 x 1 as a group, and you have the six singles as six different groups*.)

Students then complete the worksheet, finding the perimeter and area for each group, then finding the total perimeter and area as well as the number of people that can be seated.

Ask students first to help one another as a class fill in the arrangements. You may need to read through the book another time to see what the table redistributions were.

Circulate the room asking questions:

- What does this arrangement look like as an array?
- Show me how you are finding the perimeter.
- Show me how you are finding the area.
- What do you notice about the total area each time? *(remains the same)*
- How do you explain that? *(same number of tables – each table is 1 square unit)*

When students are finished, tell them they will be using this record sheet in Lesson 2 to discover and verify a few patterns in the data. Have students report back to the class the data they have collected so that everyone agrees with what should be on the chart. Each answer should be verified through models.

Objectives
Read through the language and math objectives with the students, having them tell you how they accomplished each.

Unit 4 – Classroom Lesson – Vocabulary

Duplicate on cardstock and cut apart for word cards.

comfort

tending

stretched

reunion

Unit 4 – Classroom Lesson – Vocabulary

Duplicate on cardstock and cut apart for word cards.

consuelo
cuidando
estiró
reunión

Unit 4 – Classroom Lesson – Vocabulary

Duplicate on cardstock and cut apart for word cards.

banquets

balancing

arrival

relatives

Unit 4 – Classroom Lesson – Vocabulary

Duplicate on cardstock and cut apart for word cards.

banquetes

balancear

llegada

familiares

Unit 4 Lesson 1 – Math Lesson

One per student

Mrs. Comfort's Tables

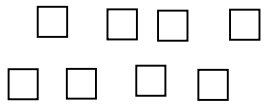
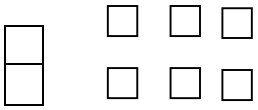
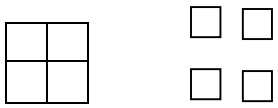
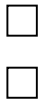
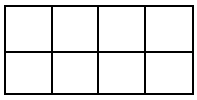
Work with an elbow partner and your teacher to complete the table below.

Arrangements (description and picture)	Perimeter 1 group	Area 1 group	Perimeter Total	Area Total	Seating Capacity	Extension
8 single tables ☐ ☐☐ ☐ ☐☐ ☐	**4 units**	**1 unit^2**	**32 units**	**8 units^2**	**32**	**32**

Unit 4 Lesson 1 – Math Lesson
One per student

Mrs. Comfort's Tables – Teacher Key

Work with an elbow partner and your teacher to complete the table below.

Arrangements (description and picture)	Perimeter 1 group	Area 1 group	Perimeter Total	Area Total	Seating Capacity	Extension
8 single tables 	**4 units**	**1 unit²**	**32 units**	**8 units²**	**32 people**	**32 people**
2 x 1 array **6 singles** 	**6 units** **4 units**	**2 units²** **1 unit²**	**6 units** **24 units**	**2 units²** **6 units²** **8 units²**	**6 people** **24 people**	**30 people**
2 x 2 array **4 singles** 	**8 units** **4 units**	**4 units²** **1 unit²**	**8 units** **16 units**	**4 units²** **4 units²** **8 units²**	**8 people** **16 people**	**24 people**
2 x 3 array 	**10 units** **4 units**	**6 units²** **1 unit²**	**10 units** **8 units**	**6 units²** **2 units²** **8 units²**	**10 people** **8 people**	**18 people**
2 x 4 array 	**12 units**	**8 unit²**	**12 units**	**8 units²**	**12 people**	**12 people**

Materials
- 36 color tiles per student
- customary ruler (inches)

Math Vocabulary
scale factor
similarity
similar
proportion
ratio

Literature Vocabulary
comfort
tending
stretched
reunion
banquets
balancing
arrival
relatives

ELPS *(English Language Proficiency Standards):*
2C, 2E, 2F, 3D, 3E, 3J

Unit 4, Lesson 1 — Grades 7-8

Math Lesson

Math Objectives:
- Compare measurements of squares.
- Work with others to find scale factors for similar squares.

Language Objectives:
- Discuss observations and measurements of shapes and their relationships.
- Explain scale factors to classmates.
- Discuss problem solving strategies with classmates.
- Justify answers regarding similarity among squares.

Building Background
As I was working with Mrs. Comfort's arrangements, I saw some interesting patterns that I wanted to investigate further. Mrs. Comfort started out with eight tables, and those tables were SQUARES; that is all sides of each table measured the same unit. Mrs. Comfort's guests made several rectangles, but only one of the rectangles was a square. What were its measurements? *(two tables by two tables)*

We are going to investigate squares today and using **scale factor** we will see what kinds of relationships we can find.

Comprehensible Input
Each of you should have 36 color tiles, scratch paper, and a pencil. (S*how your supplies.*) Let's see what squares we can make using our tiles.

The first square that we can make is a one by one square – one tile. (*Place the tile on the table.*)
Let's draw this on our scratch paper. (*Do so, trying to begin an orderly drawing and leaving room for measurement labels.)*

Now label the dimensions (*label one side only*). Since this is a square, I know that all of the sides are congruent, that is they all have the same measurement. I could label this as "1 unit," but I happen to know that this is a one-inch square tile (*measure with ruler*), so rather than labeling in generic "units," we can label in inches.

And what is the area of this square? *(pause)* Well, it's easy to see that this is ONE square. And I know that the sides are one inch. How do we find area? *(multiply l x w)*
1 inch times 1 inch = 1 SQUARE inch or $1in^2$. Label the inside your 1 tile, A =$1in^2$.

What is the next square we can make with our tiles? *(Pause to let them explore.)*

If I add one more tile to this tile, do I have a square *(no)?* No, this is a 1 x 2 rectangle.

What do I need to do to make the next largest square from this rectangle? *(pause)*

If these two sides of my rectangle measures 2 inches, then the other two sides have to measure 2 inches. Let's create a 2 x 2.

Label each side 2 inches.
What is the area? *(pause)* It's easy to see that I have FOUR square tiles covering the area – check it out with the formula l x w. The area is 2 x 2 or 4 squares, 4 square inches, or 4 in^s.

(*Follow this same pattern to create the 3 square, 4 square, 5 square and 6 square. Each time ask students if they can make any more squares from the tiles and give them time to think about it. In response, ask them if they can make a (4 x 4, etc. in order), and then process that square with the tiles. When you have created and recorded all six squares, continue.)*

I want to look at these two squares – the 1 x 1 and the 2 x 2. My question to you is, are they similar? That is, can I multiply the dimensions of all sides by the same number to get the dimensions of the other square? Discuss that with your teacher and be sure to justify your answer by saying, *(yes or no)* the squares *(are or are not)* similar because…
(pause)

Yes, these are similar squares. Let's verify by setting up a ratio of the length to the width.
L:W or $\frac{L}{W} \quad \frac{1}{1} = \frac{2}{2}$

Are these equivalent ratios? *(pause)* Of course they are – they are both forms of one.

When we change the shape of a shape or solid in proportion to the original, we call it dilation. An increase in size is called an enlargement. What SCALE FACTOR would you use to increase or enlarge the 1 by 1 square to the 2 x 2 square? In other words, what would you multiply by to increase or enlarge the 1/1 to the 2/2? *(pause)*
We would have to multiply each of the measurements by two. The scale factor is 2.

Unit 4, Lesson 1 — Grades 7-8

Math Lesson – continued

Suppose we wanted to decrease or contract or compress the size of the 2 x 2 square to the 1x1. What is the SCALE FACTOR? What would you multiply each dimension by to go from the 2 x 2 to the 1 x 1? *(pause)* 1/2 – decreasing in size from the 2 x 2 square to the 1 x 1 square uses a SCALE FACTOR of 1/2.

What about the other squares that we created with our color tiles? Are they similar to the 1 x 1 square? Check out the 3 x 3 and the 4 x 4, always using the 1/1 as the beginning square. Be sure that you verify and justify in your discussions *(pause and give students time to check them out)*.

(*Use the same strategy to work through as many of the squares as you can and still leave time for the next problem.)*

We have been using the 1/1 as our base shape, and I think we can say that all of the squares are similar to the 1/1. Are there other squares that would be easy to see without having to use arithmetic that they are similar, and what the scale factors would be for each pair? *(pause)*
I can easily find squares that are similar to 2 x 2 – any of the squares with even sides – 4 x 4 and 6 x 6. *(SCALE FACTORS for each enlarging and contracting)*

What about the 3 x 3? *(pause)* The 6 x 6 is an easy match for that one, using an enlarging scale factor of two because we have to multiply each side by two to create the enlarged shape; and a contracting scale factor of 1/2 because we have to multiply all dimensions by 1/2 to contract from the 6 x 6 to the 3 x 3.

What about the 3 x 3 and the 4 x 4? Are these two squares similar? You are going to investigate that relationship and other square relationships during the Follow-up Lesson. When you finish, I'd like for you to answer the question, ARE ALL SQUARES SIMILAR, and then justify your answer with examples.

MAS Space
What are some of the math skills you have learned so far this summer that you either didn't know before or that you were not comfortable with before? Are all squares similar?

Objectives:
Read through the math and language objectives, making sure that students understand how they accomplished each.

Unit 4 – Math Lesson – Vocabulary

Duplicate on cardstock and cut apart for word cards.

scale factor

similarity

similar

proportion

Unit 4 – Math Lesson – Vocabulary

Duplicate on cardstock and cut apart for word cards.

factor de escala
semejanza
similar
proporción

Materials
- **BLM** Recursive Review Problems Lessons 1-3
- 36 color tiles

Math Vocabulary
scale factor
similarity
similar
proportion
ratio

Literature Vocabulary
comfort
tending
stretched
reunion
banquets
balancing
arrival
relatives

Unit 4, Lesson 1 — Grades 7-8

Follow-up

Math Objectives:
- Compare measurements of squares.
- Work with others to find scale factors for similar squares.

Language Objectives:
- Discuss observations and measurements of shapes and their relationships.
- Explain scale factors to classmates.
- Discuss problem solving strategies with classmates.
- Justify answers regarding similarity among squares.

Practice and Application
Students work with the color tiles to continue their investigation of squares. Students can work together using both sets of color tiles to create more squares to verify their theory. When finished, if you have the technology available, please go online to MAS Space and respond to the question – "Are all squares similar?" Be sure that students have plenty of examples for why they know squares are similar.

QUESTIONS
- Are these two squares similar?
- How do you know these two squares are similar?
- What is the SCALE FACTOR used to determine the dimensions of the larger square?
- Suppose you had started with the larger square and wanted to contract to the smaller square – what scale factor would you use to create the smaller square?
- Explain your answer to the TV Teacher's question: Are all squares similar?

Recursive Review
Please use **BLM** *to answer the Recursive Review questions.*

- Veronica decided to buy a pair of heels she had been eying at a boutique downtown. They were originally priced at $112.00, but were on sale for 25% off. She also had a coupon for an extra 15% off of a purchase over $50. What will the price of the heels be before the clerk adds tax?

Technology Option Website that shows students how to draw midpoints to resize. http://www.mathsisfun.com/geometry/resizing.html	**Unit 4, Lesson 1** **Grades 7-8** **Follow-up** - continued --- **Writing Topics** **Independent Writing Topic** Students will have a daily writing activity which will incorporate the day's focus math vocabulary. ▪ **What is a scale factor and how is it used?** **Objectives** Review the math and language objectives to make sure that they were accomplished and that the students realize how they were accomplished.

Unit 4 Lessons 1-3 – Follow-up

Recursive Review Problems

Solve the recursive review problems using any strategy of your choice.

Unit 4 Lesson 1
Veronica decided to buy a pair of heels she'd been eying at a boutique downtown. They were originally priced at $112.00, but were on sale for 25% off. She also had a coupon for an extra 15% off of a purchase over $50. What will the price of the heels be before the clerk adds tax?

Unit 4 Lesson 2
What savings on his bill can Pedro expect if his favorite sandwich is discounted 10% off of the regular price of $8.95?

Unit 4 Lesson 3
Gary's dinner bill at the restaurant was $42.95. If he leaves the server a 20% tip, how much will his bill be altogether?

Unit 4 Lessons 1-3 – Follow-up

Recursive Review Problems

Solve the recursive review problems using any strategy of your choice.

Unidad 4 Lección 1
Verónica decidió comprar un par de zapatos que había estado mirando en una boutique en el centro. El precio original era $112.00, pero estaban en oferta por un 25% menos. También tenía un cupón por un descuento extra del 15% para una compra superior a los $50. ¿Cuál será el precio de los zapatos antes de que el vendedor le agregue los impuestos?

Unidad 4 Lección 2
¿Qué ahorro puede esperar Pedro en su cuenta si a su sándwich favorito le descuentan un 10% del precio normal de $8.95?

Unidad 4 Lección 3
La cuenta de la cena del restaurante de Gary era de $42.95. Si le deja al mozo una propina del 20%, ¿de cuánto será su cuenta en total?

Materials
- 2 skewers
- 1-in cubes cooked meat (16)
- 8 cubes pineapple
- 8 cheese cubes
- 8 cherry tomatoes
- 2 paper dessert plates
- 2 paper towels

All items listed above per partner pair
- **BLM** Kabob-Snack Fractions

Math Objectives
- Use addition, subtraction, multiplication and division to solve problems involving fractions and decimals.
- Convert between fractions, decimals, whole numbers and percents.
- Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios).
- Estimate and find solutions to application problems involving percent.

Language Objectives
- Discuss how ratios and proportions can be used to solve real-world problems.

Math Vocabulary
scale factor
similarity
similar
proportion
ratio

Literature Vocabulary
comfort
tending
stretched
reunion
banquets
balancing
arrival
relatives

Unit 4, Lesson 1 — Grades 7-8

Snack Fractions

Students should wash their hands before this activity if using food items.

Snack Fractions
Students should have the skills to answer these in small groups. Have the students work through the BLM before sharing the actual snack.

Circulate the room while students are working on the BLM, asking questions as needed to guide, redirect, extend:

QUESTIONS
- What does that number represent?
- What strategy will you use to find the percent?
- Why did you choose the bar model?
- What does your answer represent?

Finally, let them enjoy their snack.

(*Naturally, if you think the portions suggested in the materials list are too small for a middle schooler's snack, feel free to increase the amounts; make sure, though, that you make the amounts easily divided in halves – they've already done a great deal of work to get the snack.)*

Snack Fraction Journal Writing: BLM Kabob-Snack Fractions
Explain why it is or is not reasonable for 12 meats out of 40 ingredients to be more than 50% of the ingredients.

Objectives: Review the objectives with the class, making sure they understand how they achieved each.

Unit 4 Lesson 1 – Snack Fraction

One per student

Kabob – Snack Fractions

Work with your partner to solve the problems.

1. Divide the ingredients with your partner and assemble your kabob on the skewer provided. Draw your kabob on the skewer below.

2. From your picture, fill in the chart below. Then answer the following questions.

	meat	cheese	pineapple	tomatoes	Total ingredients combined
total pieces					
your portion (half)					

3. Using the ratio of (TOTAL PIECES: TOTAL INGREDIENTS COMBINED) find the percent each represents of the whole.

Meat _____% cheese _____% pineapple _____% tomatoes _____%

4. Using the ratio of (YOUR PORTION: TOTAL INGREDIENTS COMBINED) find the percent each represents of the whole.

Meat _____% cheese _____% pineapple _____% tomatoes _____%

Unidad 4 Lección 1 – Fracciones de refrigerios

Una por estudiante

Brocheta – Fracciones de refrigerios

Colabora con tu compañero para resolver los problemas.

1. Divide los ingredientes con tu compañero y arma tu brocheta en el pincho provisto. Dibuja tu brocheta en el pincho a continuación.

2. A partir de tu imagen, completa el cuadro que se encuentra abajo. Luego, responde las siguientes preguntas.

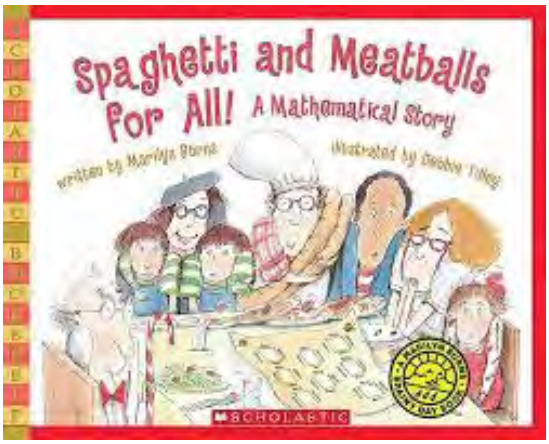
	carne	queso	piña	tomates	Ingredientes totales combinados
piezas totales					
tu porción (mitad)					

3. Usando la relación de (PIEZAS TOTALES: INGREDIENTES TOTALES COMBINADOS), encuentra el porcentaje que cada uno representa del total.

Carne _____% queso _____% piña _____% tomates _____%

Unit 4 Lesson 1 – Family Fun

Dear _____,



We read ***Spaghetti and Meatballs for All*** by Marilyn Burns today in class.

The math ideas in the story included…

_____

_____

_____

Some of the activities we did in math that relate to the book were…

_____

_____

_____

My teacher would like for us to:

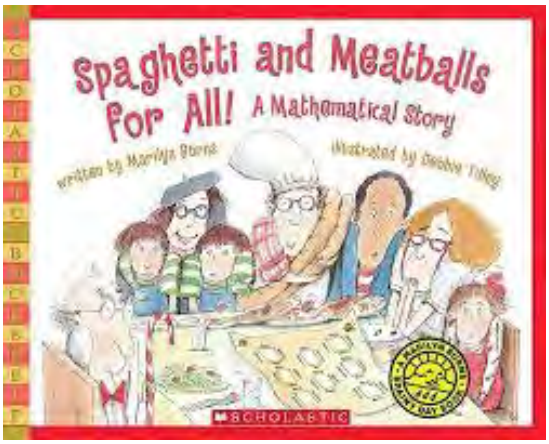
- Calculate the area of the first surface I find, at home or on a family outing, that is covered in tiles.

Sincerely,

_____

Unit 4 Lesson 1 – Family Fun

Querido _____,



Leimos ***Spaghetti and Meatballs for All*** por Marilyn Burns hoy en la clase.

Las ideas matemáticas en en cuento son:

_____
_____
_____

Algunas de las actividades que hicimos en la clase de matemáticas son:

_____
_____
_____

Mi maestro quiere que nosotros:

- Calcular el área de la primera superficie que encontremos, en casa u otro lugar, que esté cubierto de azulejos.

Atentamente,

_____

Materials
- **BLM** Color Tile Craziness-Measurement Lab Record Sheet
- **BLM** Solve It! Problems 1-2
- **BLM** Fraction Action and *X* Marks the Spot
- **BLM** Lessons 2-3 CGI ***Spaghetti and Meatballs for All***

Math Objectives
- Solve word problems using a variety of strategies and defend their strategies.
- Model and solve 3-step word problems.
- Compose and decompose values to show a new representation of the value.
- Find equivalent fractions.

Language Objectives
- Speak to partners, teacher, and class using vocabulary.
- Discuss problem solving process and strategies.
- Explain how they decided to rename the target number.

Math Vocabulary
scale factor
similarity
similar
proportion
ratio

Literature Vocabulary
comfort
tending
stretched
reunion
banquets
balancing
arrival
relatives

Unit 4, Lesson 2 — Grades 7-8

Daily Routine

The following daily activities will help prepare your students for the Post-assessment. They are not optional.

ESSENTIAL

Measurement Lab
- Lesson 1 – omit
- **Lesson 2 – area**
- Lesson 3 – similar figures

Lesson 2 Materials
- 36 color tiles
- graph paper

Lesson 2 Student Groups
1) create as many arrays as possible with all 36 color tiles
2) create a diagram of each array on graph paper
3) label the dimensions of each array next to its diagram
4) answer questions on **BLM** Color Tile Craziness

Solve It! Multi-step problem solving
- Lesson 1 – omit
- **Lesson 2 – pairs, 3-step problem**
- Lesson 3 – pairs, 3-step problem

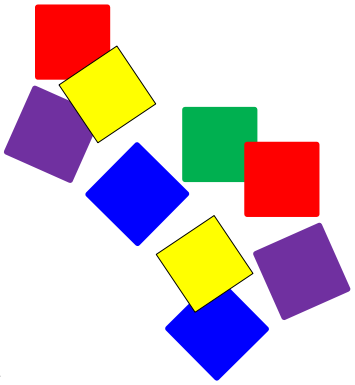
Fraction Action
- Lesson 1 – omit
- **Lesson 2 – BLM Fraction Action and X Marks the Spot**
- Lesson 3 – BLM Fraction Action and X Marks the Spot

***X* Marks the Spot**
- Lesson 1 – omit
- **Lesson 2 – BLM Fraction Action and X Marks the Spot**
- Lesson 3 – BLM Fraction Action and X Marks the Spot

CGI
- Lesson 1 – omit
- **Lesson 2 – rate, multiplication (assessment item 7)**
- Lesson 3 – price, partitive (assessment item 6)

Assessment Items As a result of this unit, students will be prepared for the following assessment items: 2, 3, 4, 5, 6, 7 **TEKS for this Unit** 7th – 7.2D, 7.3B, 7.4B, 8th – 8.2D, 8.6AB	**Unit 4, Lesson 2** **Grades 7-8** **Daily Routine** - continued  **----------** **The following activities, although certainly developmentally appropriate for your 7th and 8th grade students, do not specifically address objectives assessed on the Post-assessment. Schools with shorter teaching spans can consider omitting some or all these activities as your time permits.** **----------** **OPTIONAL** **Target Number** • Lesson 1 – omit • **Lesson 2 – Target Number 15** • Lesson 3 – Target Number 45 **Money Matters** (*If you have a full program and wish to use this optional activity, you will find BLMs and Explanations in the Optional Activities Tab of your Teacher's Guide*.)

Unit 4 Lesson 2 – Daily Routines – Measurement Lab
One per student



Color Tile Craziness – Measurement Lab Record Sheet

Students should work in small groups.

Materials:

- 36 color tiles
- graph paper

Task:

1) Create as many arrays as possible using ALL 36 color tiles at one time.
2) Shade a diagram of the arrays on the graph paper.
3) Label each array with its dimensions.

Which array has the greatest perimeter?

Which array has the least perimeter?

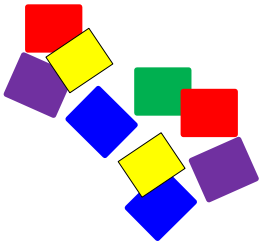
What is the area of each of those arrays?

What is the area of ALL of the arrays you created?

What conclusions can you make from this investigation?

Unidad 4 Lección 2 –
Una por estudiante

Locura de fichas de colores - Hoja de registro del laboratorio de medición



Los estudiantes deben trabajar en grupos pequeños.

Materiales:

- 36 fichas de colores
- papel cuadriculado

Tarea:

1) Crea la mayor cantidad de matrices posible usando las 36 fichas de colores a la vez.
2) Sombrea un diagrama de las matrices en el papel cuadriculado.
3) Etiqueta cada matriz con sus dimensiones.

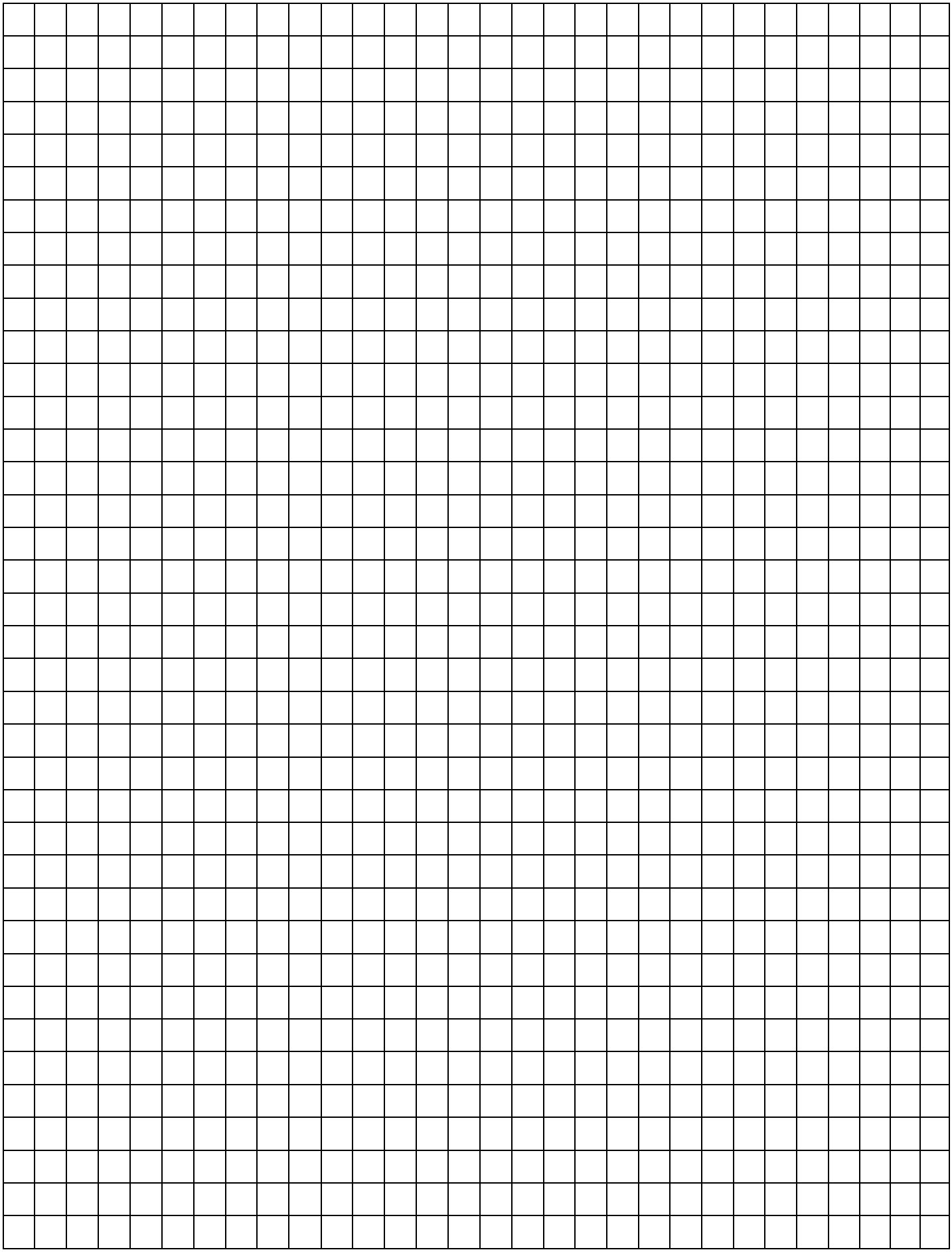
¿Qué matriz tiene el perímetro más grande?

¿Qué matriz tiene el perímetro más pequeño?

¿Cuál es el área de cada una de esas matrices?

¿Cuál es el área de todas las matrices que creaste?

¿Qué conclusiones puedes sacar de esta investigación?



Unit 4 Lesson 2 – Daily Routines - Solve It! Problems (Pairs)

One per student

Partner #1 - Problem 1:
Martin needed a few new tools for his lawn service. He saw an ad in the paper for a big sale at his favorite store. All power tools were 20% off the regular price, which meant he could finally buy that new edger he needed, regularly priced $399.99. Hand tools were 45% off the regular price, so he could buy a new landscape shovel, regularly priced $49.99. If he only bought these two items on sale, what would his total be before sales tax?

Problem Solution Name:	**Solution Verification** Name:

Partner #2 - Problem 2:
Martin had saved $300 for buying new tools for his lawn service. He needed both a new weed eater and a new leaf vac. He found a big sale online. Power lawn tools were on sale for 25% off the regular price. The combination tool he really liked was on sale for $119.00 for both the weed eater and the vac in one machine. He had enough money to buy a new hedge trimmer, also 25% off the regular price, on sale for $89. How much did he save buying at the sale prices?

Problem Solution Name:	**Solution Verification** Name:

Unit 4 Lesson 2 – Daily Routines - Solve It! Problems (Pairs)

One per student

Compañero # 1 - Problema 1:

Martin necesitaba unas herramientas nuevas para su servicio de mantenimiento de césped. Vio un anuncio en un periódico de una gran venta en su tienda favorita. Todas las herramientas eléctricas estaban un 20% menos del precio normal, lo que significaba que finalmente podría comprar esa nueva bordeadora que necesitaba, cuyo precio regular era $399.99. Las herramientas manuales estaban un 45% menos del precio normal, por lo que podría comprar una nueva pala de jardinería, cuyo precio regular era $49.99. Si solo comprara estos dos artículos en oferta, ¿cuál sería el total antes del impuesto sobre las ventas?

Solución del problema: **Nombre:**	**Verificación de la solución** Nombre:

Compañero # 2 - Problema 2:

Martin había ahorrado $300 para comprar herramientas nuevas para su servicio de mantenimiento de césped. Necesitaba una nueva desmalezadora y una aspiradora de hojas. Encontró una gran venta en línea. Las herramientas eléctricas para el césped estaban en oferta con un 25% de descuento sobre el precio regular. La herramienta combinada que él realmente quería estaba en oferta a $119.00 para ambas, la desmalezadora y las aspiradoras en una máquina. Tenía suficiente dinero para comprar un nuevo cortasetos eléctrico, también con un 25% de descuento sobre el precio regular, en oferta a $89. ¿Cuánto ahorró comprando a los precios de oferta?

Solución del problema: **Nombre:**	**Verificación de la solución** Nombre:

Unit 4 Lesson 2 – Daily Routines – Fraction Action and *X* Marks the Spot

One per student

Fraction Action

Materials:
None for this activity

Task:
Maria ordered a 48 ounce drink and finished 50% of it. Eleanor ordered a 32 ounce drink and finished 75% of it. Jackie ordered a 24 ounce drink and drank 100% of it. Compare the quantities of fluids the friends drank.

X Marks the Spot

Write an equation for each statement.	
Sarah has $10, which is four less than twice the amount that Matt has?	At the middle school dance, the DJ played 12 slow songs, which was two less than half the number of fast songs?

Unit 4 Lesson 2 – Daily Routines – Fraction Action and *X* Marks the Spot
One per student

Fraction Action

Materiales:
Ninguno para esta actividad

Tarea:
María pidió una bebida de 48 onzas y terminó un 50% de esta. Eleanor pidió una bebida de 32 onzas y terminó un 75% de esta. Jackie pidió una bebida de 24 onzas y bebió un 100% de esta. Compara la cantidad de líquidos que las amigas bebieron.

X Marca el sitio

Escribe una ecuación para cada oración.	
Sarah tiene $10, los cuales son cuatro menos que el doble de lo que tiene Matt.	En la escuela intermedia de danza, el DJ puso 12 canciones lentas, lo que fue dos menos que la mitad del número de canciones rápidas.

Unit 4 Lesson 2-3 – Daily Routines - CGI Problems

One per student

CGI – *Spaghetti and Meatballs for All*

	Multiplication	**Measurement Division**	**Partitive Division**
Grouping/ Partitioning	Mr. Comfort had 2 1/2 pounds of meat from which he used to make the meat sauce for his spaghetti. Each pound cooked out about 4 ounces of fat. Approximately how many ounces of fat were cooked out of the meat?	There were 16.05 pounds of spaghetti for Mr. Comfort to cook for the banquet. If he wanted each of his relatives to have about half a pound, how many relatives could he serve? (Hint: a pound equals 16 ounces.)	Mr. Comfort shared 128 meatballs among 32 guests at the reunion. How many meatballs did each guest receive?
Rate	Mr. Comfort can make 15 meatballs in a minute. At that rate, how many meatballs can he make in 30 minutes?	Mr. Comfort can make 15 meatballs in one minute. At that rate, how long would it take him to make 120 meatballs?	Mr. Comfort stretched his strength and made 1800 meatballs in 15 minutes. If he made them at a constant rate, about how many meatballs did he make in one minute?
Price	A head of Romaine lettuce cost $2.49. If Mr. Comfort bought 16 heads of lettuce, how much did he pay for the lettuce?	Mr. Comfort calculated that each salad costs $2.80 to serve. If he spent $84.00 on the salads, how many salad servings did he prepare?	Mr. Comfort spent $97.50 on salad ingredients for the banquet. If he served a total of 30 relatives, how much did each serving cost?

Unit 4 Lesson 2-3 – Daily Routines - CGI Problems
One per student

CGI – *Spaghetti and Meatballs for All*

	Multiplicación	**División de medida**	**División partitiva**
Agrupación/ Partición	El Sr. Comfort tenía 2 1/2 libras de carne, de las que usó para hacer la salsa de carne para el espagueti. De cada libra se cocinaron aproximadamente 4 onzas de grasa. ¿Aproximadamente cuántas onzas de grasa se cocinaron de la carne?	Había 16.05 libras de espagueti para que el Sr. Comfort cocinara para el banquete. Si quisiera que cada uno de sus parientes recibiera cerca de media libra, ¿a cuántos parientes les podría servir? (Pista: una libra equivale a 16 onzas).	El Sr. Comfort compartió 128 albóndigas entre 32 invitados en la reunión. ¿Cuántas albóndigas recibió cada invitado?
Tasa	El Sr. Comfort puede hacer 15 albóndigas en un minuto. A esa tasa, ¿cuántas albóndigas puede hacer en 30 minutos?	El Sr. Comfort puede hacer 15 albóndigas en un minuto. A esa tasa, ¿cuánto tiempo le llevaría hacer 120 albóndigas?	El Sr. Comfort excedió sus fuerzas e hizo 1800 albóndigas en 15 minutos. Si las hizo a una tasa constante, ¿aproximadamente cuántas albóndigas hizo en un minuto?
Precio	Una planta de lechuga romana cuesta $2.49. Si el Sr. Comfort compró 16 plantas de lechuga, ¿cuánto pagó por la lechuga?	El Sr. Comfort calculó que cada ensalada cuesta $2.80 para servir. Si gastó $84.00 en las ensaladas, ¿cuántas porciones de ensalada preparó?	El Sr. Comfort gastó $97.50 en ingredientes para la ensalada para el banquete. Si le sirvió a un total de 30 parientes, ¿cuánto costó cada porción?

Materials
- class set of vocabulary word cards
- 12x18 light colored construction paper
- markers or crayons
- magazines for clipart
- computers for clipart
- scissors

Literature Selection
Spaghetti and Meatballs for All
by Marilyn Burns

Math Vocabulary
scale factor
similarity
similar
proportion
ratio

Literature Vocabulary
comfort
tending
stretched
reunion
banquets
balancing
arrival
relatives

ELPS *(English Language Proficiency Standards):*
2D, 2I, 3E, 3G, 4G, 5B, 5G

Unit 4, Lesson 2 — Grades 7-8

Classroom Lesson

Every day teachers must post the objectives on the board, read them to the students, and have students read them together with the teacher. At the end of the lesson, teacher and students should review to see if they have accomplished both math and language objectives.

Math Objectives:
- Verify similarities of objects found by classmates.

Reading Objective:
- Infer character traits based on what characters say and do.

Language Objectives:
- Use vocabulary words to create a poster of Silly Associations.
- Use adjectives to discuss character traits.

BEFORE READING
Practice and Application - Vocabulary
Silly Association word posters
1. Look at the word wall with the eight literature vocabulary words for this unit, along with the student-friendly definitions (posted in Lesson 1). For each word, have students explain how the word was used in the story. You can ask questions to relate some of the word to students' own lives. Some possible questions are:
   - Who **comforts** you when you're upset? A **relative**? A friend?
   - Have you ever had a family **reunion**? When? Where? Why?
   - What are you **balancing** in your life right now? *(time with family, school, time with friends, work, etc.)* Do you think you have a good balance?

2. Explain: Today I would like for you to select three words from these eight words, and create a Silly Association Poster. This is a poster that ties words together in some silly way that is meaningful to you.

3. Model this process for students:
   a. Choose three words from the list.
   b. Say a silly sentence using all three words.
   c. Write the sentence down for students to see, underlining the vocabulary words.
   d. Draw an illustration of your sentence.

Example: It was a great comfort to the cow to be stretched out while balancing on the moon.
(The visual would be of a cow stretched out in the curve of the fingernail moon.)

4. Have students work on their own posters. Circulate and help students as needed to correctly use each word in their sentence.

Language Center
Student should continue creating Visual-Verbal Word Association Charts for different literature vocabulary words, and adding them to their binders. Make sure students are able to reference the word wall with the student-friendly definitions to fill in that part of the chart.

Unit 4, Lesson 2

Classroom Lesson - continued

Grades 7-8

ELLs: You may want to meet with a small group of ELLs during this time to help them create a sentence, since this is a more challenging writing task.
As students finish their posters, let them walk around the room looking silently at others. When everyone is finished, have students tape their posters to the wall in preparation for a Gallery Walk in Lesson 3.

Building Background - Literature
Attribute Chart activity
Explain to students that in life the things we do and the things we say tell others what kind of a person we are. Give students several examples of this, based on things students have done/said recently. What does that tell us about them? Do their actions/words show that they're kind? Responsible? Concerned? Frustrated? Anxious? etc. Lead students in a brief discussion about this.

Explain that today they are going to think more deeply about what certain characters do and say in the story, and what this tells us about them. What kind of a person are they? Show students an Attribute chart you have prepared *(image below)*, similar to the one used in Unit 1 to think about Ricardo's traits. Read the adjectives in the chart, discussing unfamiliar adjectives. Tell students that today as you read the story, they will be thinking about which of these words describe which characters.

Attributes						
	organized	**helpful**	**rushed**	**frustrated**	**comforting**	**oblivious**
Mrs. Comfort						
Mr. Comfort						
Mr. and Mrs. Comfort's daughter						

Mini-Unit
Writing a Friendly Letter
Teach students the form of a friendly letter. Provide them with stationery and envelopes for their final drafts. Here is a simple template: http://abcteach.com/Writing/FLinfo.htm

Unit 4, Lesson 2 — Grades 7-8

Classroom Lesson - continued

ELLs: You can use these suggested adjectives, or switch them for different ones based on the words you would like your students to work with. To make the activity less language-intensive, you can use fewer adjectives, focusing on just four key words. You can also choose simpler *(or more challenging)* adjectives for some of the words.

Example: Alternative adjectives for **frustrated**:
- **upset, angry** (simpler)
- **exasperated, irritated** (more challenging)

TEACHERS
Students should have the five rectangles cut out from the BLM Similar Rectangles record sheet; HOWEVER, they will need the table on the sheet, so tell them not to destroy the record sheet.

DURING READING
Comprehensible Input - Literature
Read aloud ***Spaghetti and Meatballs for All***. Pause occasionally to have students think about which adjectives they feel describe the three characters in the chart.

Make sure students explain WHY they think the character has that particular trait – what did the character **do** or **say** to show that trait?

AFTER READING
Attribute chart

1. Put students in small groups. Give each group a copy of **BLM Attribute Chart Template.** Have students discuss in small groups which attributes they feel best describe each character, and mark them on their copy of the chart. (Note: the **BLM** has a blank template as well, if you choose to use different adjectives with your group of students.)

2. Regroup the class and have students share. Place check marks in the class Attribute chart to indicate which traits students feel best describe each character.

   Keep in mind that students could have different opinions on which traits are best for each character; there isn't necessarily a "right" or "wrong" answer. For example, some students may think Mr. Comfort is comforting because he keeps telling his wife "Don't worry." On the other hand, some students may think that Mr. Comfort is NOT really comforting, because he doesn't realize that what he's saying is making his wife more and more frustrated.

3. If time permits, you may want to have students share whether any of the traits could be used to describe them, or a relative of theirs.

Classroom Lesson - continued

Transition to Math

Students discuss their findings from Lesson 1 square activity. If they haven't already done so, please answer the final question – are all squares similar? Be sure that students can justify their answers, backing them up with facts.

Sample student discussion:

The ratios that represent the length of the square as compared to the width are all equivalent ratios; therefore they must represent equivalent forms, in this case similar squares.

All squares are similar to the 1 x 1 square. If all squares are similar to the 1 x 1 square, then all squares must be similar to one another.
Regardless of the dimensions of the squares, there is a scale factor which can be used to generate the similar square.

If you have not placed your responses on MAS Space, and you have the technology to do so, please do now.

Objectives

Review both language and math objectives, making sure students understand how they accomplished each.

Materials
- **BLM** Similar Rectangle Cut-outs
- **BLM** Similar Rectangles Record Sheet
- **BLM** Similar Rectangles Record Sheet-Teacher Guide
- scissors
- customary ruler (inches)

Math Vocabulary
scale factor
similarity
similar
proportion
ratio

Literature Vocabulary
comfort
tending
stretched
reunion
banquets
balancing
arrival
relatives

ELPS *(English Language Proficiency Standards):*
2C, 2E, 2F, 3D, 3E, 3J, 4F, 5G

Teacher Note
Make sure to give the students a few minutes to cut out their rectangles.

Unit 4, Lesson 2 — Grades 7-8

Math Lesson

Math Objectives:
- Compare measurements of rectangles.
- Work with others to find scale factors and similar rectangles.

Language Objectives:
- Discuss observations and measurements of shapes and their relationships.
- Explain scale factors to classmates.
- Discuss problem solving strategies with classmates.
- Write solutions for finding scale factors and similar rectangles.
- Explain how to determine when a rectangle is similar to another rectangle.

Building Background
In Lesson 1 you discovered that all squares are similar. When you think about it, all of the ratios that represent the length as compared to the height of the square are all equivalent ratios – they all equal ONE! No matter what the dimensions are, there is a SCALE FACTOR that can represent an enlargement or a contraction. You might have to use fractions or decimals, but there is one for all squares.

I wonder if that is true for all rectangles…? That is what we are going to investigate today – various rectangles. What do you think? Since all squares are similar, do you think that all rectangles are similar as well? *(Let students discuss with elbow partner, then share thoughts with whole class. Make sure they are giving mathematical reasons for their predictions.)*

Comprehensible Input
Using the BLM Similar Figures, walk through the lesson modeling and stopping for discussions as you go.

First, line up the rectangles so that you have them in order from the smallest to the largest. In the middle of the rectangles, number them 1-5 *(smallest to largest)*. Leave room to label your side lengths!

Now, let's take a look at the side lengths of each of the rectangles. Let's measure each rectangle and label it INSIDE the perimeter.

Unit 4, Lesson 2 — Grades 7-8

Math Lesson - continued

Because copy machines can sometimes distort images, we are going to measure to the nearest half-inch. As you investigate during the follow-up lesson, you will want to use these measurements. Let's measure the rectangles now. Fill in the chart as you go. *(Walk around and monitor student progress. Help with measuring to the nearest inch if necessary.)It would benefit the students, and you, to take a minute to discuss some organizational issues while measuring. Dimensions of length and width (and ultimately height) are all dependent on the position of the figure. If left the way the rectangles are positioned on the handout, students may overlook the necessity of comparing corresponding sides between rectangles. Students may want to turn rectangles in the same direction to help. However, let them discover this concept through trial and error rather than telling them up front to do so.*

Start the following discussion. Let this be the opportunity for students to realize they need to organize their measurements in the chart the same for each rectangle. The organizational method used for this lesson example was the longer side for length and the shorter side for width.

Let's check with the rest of the class and make sure we all agree on the measurements. *(Student measurements may vary from these. Please see* **Teacher Note** *in the sidebar.)*

#1: (1 in x $\frac{1}{2}$ in)

#2: ($1\frac{1}{2}$ in x 1in)

#3: ($2\frac{1}{2}$ in x 2 in)

#4: (3 in x 2 in)

#5: (5 in x 4 in)

According to your measurements, do you see any rectangles that are obviously similar? Don't put pencil and paper to it yet, just look at the numbers and see if you can see any relationships between them. *Give students time to discuss with partners or groups because they will have to deal with fractions mentally. Although the arithmetic is simple mental math, students tend to be insecure about their mental calculations. The proportional rectangles may NOT be as obvious as we hope they are at first. This is a good way to read the level of understanding with your class.*

Teacher Note
The copy machine may have distorted the size of the images a bit, so the answers in this lesson can be considered guides. Please use whatever measurements your students are finding on the rectangles. Do NOT make them substitute their actual real-world measurements for the measurements listed in the lesson directions. That will defeat the purpose of having them measure with the ruler.

Even if the copy machine enlarges the images, they will stay proportional to what was originally intended. Therefore, the assignments holds validity and the lesson steps remain the same.

Unit 4, Lesson 2 — Grades 7-8

Math Lesson - continued

The lesson notes that follow will vary from the discussion you have with your class. It is just an example. Let the students guide the discussion; you facilitate and ask probing, clarifying, and thought provoking questions.

So you think rectangles #3 and #5 are proportional at first glance? Why? …So you're saying I can just double the measurements of #3 and get the same measurements that #5 has? Great! Now think about that in the opposite direction. What would I have to do to #5 to get the measurements for #3? *(half them)*

Let's see if our cut-outs represent what we're thinking. *(Take your cut outs and lay the smaller one on top of the larger one.)*

What relationship can you see by comparing the actual rectangles?

(Fold the larger one over the smaller one – the length of the larger one is two times the length of the smaller one. Do the same for the width. The width is two times the length of the smaller rectangle.)

When you said to "double" the measurements, you discovered what is called Scale Factor. Going from rectangle #3 to #5 has a scale factor of 2. Going from #5 to #3 has a scale factor of? *(* $\frac{1}{2}$ *) (Mathematically, this relationship is always multiplication and not written as division. However, it is common practice to allow students to say ÷2 instead of times* $\frac{1}{2}$*).* This is always a multiplicative relationship and NOT additive.

Let's compare the dimensions. (*calculate equivalent ratios)*

Repeat the process with the other rectangles. This lesson will continue into the Follow-up.

Rectangles are purposefully set up like this:

#3 to #5 scale factor (x2)
#5 to #3 scale factor (x $\frac{1}{2}$ or ÷2)
#2 to #4 scale factor (x2)
#4 to #2 scale factor (x $\frac{1}{2}$ or ÷2)
#1 is NOT proportional to any of the other rectangles

Some were set up to catch the common mistake of making additive relationships. #4 and #5 are NOT proportional to each other but will

	Unit 4, Lesson 2 **Grades 7-8** **Math Lesson** - continued  --- appear to be mathematically if a student recognizes the additive relationship of *(+2)* on the length and width. #2 and #4 are NOT proportional. Students may see the additive relationship of *(+1)*. It is important to address this misconception if it is not naturally brought up in class. Disprove their proportionality mathematically *(equivalent ratios)* and visually *(with cut-outs)*. **MAS Space** Share your findings during the Measurement Lab today about area and perimeter. What conclusions did you draw from your investigation? **Objectives** Read through the math and language objectives, making sure that students understand how they accomplished each.

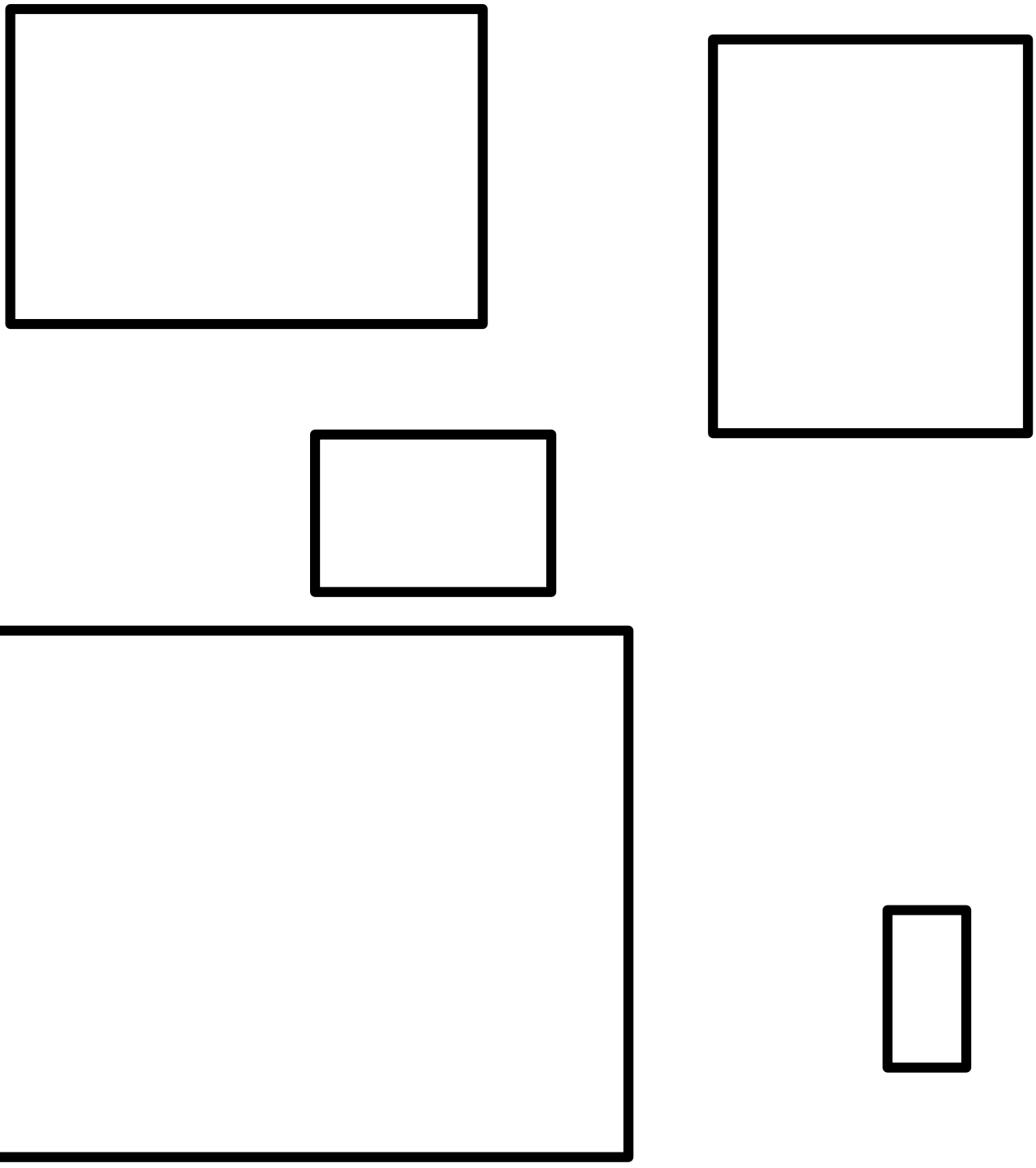
Attributes						
	organized	**helpful**	**rushed**	**frustrated**	**comforting**	**oblivious**
Mrs. Comfort						
Mr. Comfort						
Mr. and Mrs. Comfort's daughter						

Atributos						
	Organizado/a	**servicial**	**corrio**	**frustrado**	**consolador**	**inconsciente**
Sra. Comfort						
Sr. Comfort						
La hija del sr. y la sra. Comfort						

Unit 4 Lesson 2 – Math Lesson
One per student

Similar Rectangle Cut-outs

Cut out rectangles leaving as much black border as possible.



Unit 4 Lesson 2 – Math Lesson
One per student

Similar Rectangles Record Sheet

Work with your peers and teacher to complete this activity.

Task:

- label rectangles from 1-5 in order from smallest to largest
- measure dimensions of each rectangle to the nearest half-inch (length and width)
- label side lengths on each rectangle
- fill in the chart on the right
- answer questions below

Measurement Chart		
rectangles	**length**	**width**
smallest 1		
2		
3		
4		
largest 5		

1. What organizational strategy did your group use to fill in the Measurement Chart? Why?

2. List all of the proportional relationships you could find between the rectangles and list them in the Proportions Chart. Don't forget the inverse relationships!

3. Did you find any rectangles that were NOT proportional to any other rectangle? How did you know it wasn't proportional?

Proportions Chart		
first rectangle	**Scale Factor**	**second rectangle**

4. List any rectangles that appeared to be proportional but were NOT. Why did they seem proportional? How did your group disprove their proportionality?

Unit 4 Lesson 2 – Math Lesson
One per student

Similar Rectangles Record Sheet

Trabaja con tus compañeros y maestro/a para completar esta actividad.

Tarea:

- Etiqueta los rectángulos de 1-5, de más pequeño a más grande
- Mide las dimensiones de cada rectángulo hasta la media pulgada más cercana (largo y ancho)
- Etiqueta la longitud de los lados en cada rectángulo
- Llena el gráfico a la derecha
- Contesta las preguntas a continuación:

Gráfico de medición		
rectángulos	**largo**	**ancho**
más pequeño 1		
2		
3		
4		
más grande 5		

1. ¿Qué estrategia empleó tu grupo para llenar el gráfico de medición? ¿Por qué?

2. Haz una lista de todas las relaciones proporcionales que podías encontrar entre los rectángulos y escríbelas en el gráfico de proporciones. ¡No te olvides de las relaciones inversas!

Grafico de proporciones		
Primer rectangulo	**Factor de escala**	**Segundo rectangulo**

3. Encontraste algunos rectángulos que no fueron propocionales a los otros rectángulos? ¿Cómo sabías que no fue proporcionales?

4. Has una lista de los rectángulos que a primera vista parecían proporcionales pero que no lo eran. ¿Por qué parecían ser proporcionales cuando en realidad no lo eran? ¿Cómo desaprobaron su proporcionalidad?

Unit 4 Lesson 2 – Math Lesson
One teacher copy

Similar Rectangles Record Sheet – Teacher Guide

Work with your peers and teacher to complete this activity.

Task:

- label rectangles from 1-5 in order from smallest to largest
- measure dimensions of each rectangle to the nearest half-inch (length and width)
- label side lengths on each rectangle
- fill in the chart on the right
- answer questions below

Measurements in chart were intended. Please use whatever measurements your copier produces. Measure rectangles prior to lesson and make adjustments to copier settings if needed.

Measurement Chart		
rectangles	**length**	**width**
smallest 1	**1**	**$\frac{1}{2}$**
2	**$1\frac{1}{2}$**	**1**
3	**$2\frac{1}{2}$**	**2**
4	**3**	**2**
largest 5	**5**	**4**

1. What organizational strategy did your group use to fill in the Measurement Chart? Why?
length = long side and width = short side OR width = long side and length = short side
Either strategy works mathematically as long as corresponding sides of rectangles are compared.

2. List all of the proportional relationships you could find between the rectangles in the Proportions Chart. Don't forget the inverse relationships!

3. Did you find any rectangles that were NOT proportional to any other rectangle? How did you know it wasn't proportional?
Yes. #1 was not proportional. Does not have a scale factor with the other rectangles. *(Discuss how they worked this out mathematically and/or tactilely.)*

Proportions Chart		
first rectangle	**Scale Factor**	**second rectangle**
#2	**(x2)**	**#4**
#4	**(x $\frac{1}{2}$)**	**#2**
#3	**(x2)**	**#5**
#5	**(x $\frac{1}{2}$)**	**#3**

4. List any rectangles that appeared to be proportional but were NOT. Why did they seem proportional? How did your group disprove their proportionality?
They look proportional because #2 to #3 had a relationship of (+1) and #4 to #5 had a relationship of (+2). But a scale factor is a multiplication of dimensions like the ZOOM IN and ZOOM OUT buttons on computers or the magnification settings on a microscope (x10, x20, x50, x100).

Materials
- rectangle cut-outs
- **BLM** Similar Rectangles Record Sheet
- **BLM** King of the Mountain-Game Instructions
- King of the Mountain Game Board
- game markers
- dominoes (1 set per pair)
- graph paper
- scratch paper
- **BLM** Recursive Review Problems Lessons 1-3

Math Vocabulary
scale factor
similarity
similar
proportion
ratio

Literature Vocabulary
comfort
tending
stretched
reunion
banquets
balancing
arrival
relatives

Unit 4, Lesson 2 — Grades 7-8

Follow-up

Math Objectives:
- Compare measurements of rectangles.
- Work with others to find scale factors and similar rectangles.

Language Objectives:
- Discuss observations and measurements of shapes and their relationships.
- Explain scale factors to classmates.
- Discuss problem solving strategies with classmates.
- Write solutions for finding scale factors and similar rectangles.
- Explain how to determine when a rectangle is similar to another rectangle.

Practice and Application
Continue Math Lesson. Circulate the room asking questions to clarify, probe, and enrich.

QUESTIONS
- How do you know these two rectangles are similar?
- What is the SCALE FACTOR used to determine the dimensions of the larger rectangle?
- Suppose you had started with the larger rectangle – what scale factor would you have used to create the smaller rectangle?
- You have not included these two rectangles as a similar pair. How do you know they are NOT similar?

When you are finished, discuss the findings.

Teach students how to play the game – King of the Mountain. It is a two player game. Be sure students understand the path their game piece will follow throughout gameplay. Arrows lead the way, but check for understanding before they start. Each player has his/her own side of the board.

Recursive Review
*Use **BLM** Recursive Review Problems found in Lesson 1.*

- What savings on his bill can Pedro expect if his favorite sandwich is discounted 10% off of the regular price of $8.95?

	Unit 4, Lesson 2 **Grades 7-8** **Follow-up** - continued  --- **Writing Topics** **Independent Writing Topic** Students will have a daily writing activity which will incorporate the day's focus math vocabulary. • **Explain your conclusions from the rectangle investigation today. Are all rectangles similar? Why do you feel that way?** **Objectives** Review the math and language objectives to make sure that they were accomplished and that the students realize how they were accomplished.

Unit 4 Lesson 2 – Follow-up

One per pair

King of the Mountain – Game Instructions

Materials:

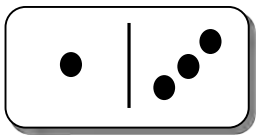
- King of the Mountain Game Board
- game markers (1 per player)
- dominoes (1 set per pair)
- die (1 per pair) *10-sided or 12-sided dice would be ideal
- graph paper
- scratch paper

Procedure:

The object of the game is to be the first player to make it to the top of the mountain. You advance on the arrow-led path by correctly creating a similar rectangle using the dimensions provided by a domino and a scale factor determined by the die.

- Place all of the dominoes face down.
- Place the game board so that each player is positioned on their own side of the mountain.
- Each player puts his/her game piece in the start position.
- Player 1 chooses a domino and rolls the die.
    - Domino – dimensions of rectangle. Player must announce which number will be used for length and width. Ratio **length:width** will be used for this game.
    - Die – scale factor
- Player 1 calculates the dimensions for a similar rectangle using the information from his/her domino and die combination. Player 2 also calculates the new dimensions. (Player may use graph paper to aid in calculations.)
- Player 1 gives answer. Player 2 confirms.
    - Correct answer – Player advances 1 space following arrows.
    - Incorrect answer – Player does not advance.
- Repeat process with Player 2.
- Play continues until someone reaches the top and is crowned King of the Mountain!

Ex: Player decides **3** is length and **1** is width. Sets up ratio as $\frac{\textbf{length}}{\textbf{width}} = \frac{\mathbf{3}}{\mathbf{1}}$.



Player multiplies $\frac{\mathbf{3}}{\mathbf{1}}$ **x 5** to get similar rectangle dimensions of $\frac{\mathbf{15}}{\mathbf{5}}$.

If player answers $\frac{\mathbf{5}}{\mathbf{15}}$ that is INCORRECT because ratio order was not kept consistent with **length** as numerator and **width** as denominator.

Unit 4 Lesson 2 – Follow-up

One per pair

Rey de la montaña – Game Instructions

Materiales

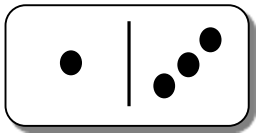
- Dominó
- 1 dado
- tablero de juego
- piezas del juego
- Papel borrador y lápiz
- Papel gráfico

Procedimiento:

El primer jugador que llega a la cima de la montaña gana el juego. Los jugadores avanzan según las flechas y senderos al generar correctamente un rectángulo similar usando las dimensiones representadas por la pieza de dominó y un factor de escala indicado por el dado. .

- Coloca los dominós boca abajo en el centro del área de juego. Coloca el tablero de juego para que cada jugador pueda ver su propio lado de la montaña.
- Los jugadores colocarán sus piezas del juego en el tablero, en los bloques iniciales.
    - El Jugador 1 escoge una pieza de dominó y arroja el dado
    - Dominó – dimensiones del rectángulo. El jugador tiene que anunciar cuál número representa lo largo del rectángulo y cuál representa lo ancho. Razón: **largo:ancho** se utilizará para el juego.
    - Dado – escala de factor
- Jugador 1 calcula las dimensiones de un rectángulo similar usando la información prestado por la combinación de pieza de dominó y dado. Jugador 2 también calcula las nuevas dimensiones. (Los jugadores pueden usar papel gráfico para hacer las calculaciones.)
- Jugador 1 da la repuesta. Jugador 2 confirma la respuesta.
    - Respuesta correcta – El jugador mueve 1 espacio siguiendo las flechas.
    - Respuesta incorrecta- El jugador no mueve
- El juego continúa con el siguiente jugador.
- El juego continúa de esta manera hasta que alguien llega a la parte de arriba de la montana y se corona "rey".

Ex: El jugador decide que **3** es la longitud y **1** es la enchura. La razón es $\frac{\text{1argo}}{\text{a } ncho} = \frac{\mathbf{3}}{\mathbf{1}}$.



Unit 4 Lesson 2 – Follow-up

One per pair

King of the Mountain Game Board

KING KING

Move 1 extra space!

Move 1 extra space!

Move 2 extra spaces!

Move 2 extra spaces!

Move 2 extra spaces!

Move 2 extra spaces!

START

START

Materials
- 2 paper dessert plates
- 2 paper towels
- 2 – 100 calorie snack bags
- 2 – 4-function calculators

All items above per partner pair
- **BLM** Snack Bag-Snack Fractions

Math Objectives
- Use addition, subtraction, multiplication and division to solve problems involving fractions and decimals.
- Convert between fractions, decimals, whole numbers and percents.
- Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios).
- Estimate and find solutions to application problems involving percent.

Language Objectives
- Discuss how ratios and proportions can be used to solve real-world problems.

Math Vocabulary
scale factor
similarity
similar
proportion
ratio

Literature Vocabulary
comfort
tending
stretched
reunion
banquets
balancing
arrival
relatives

Unit 4, Lesson 2 — Grades 7-8

Snack Fractions

Students should wash their hands before this activity if using food items.

Snack Fractions
Students should have the skills to answer these in small groups. Have the students work through the BLM before sharing the actual snack.

The strategies suggested are certainly not the only strategies that could be used to solve the unit rate and proportion problems, but are helpful to students who don't yet understand the short cuts.

Please be sure to LABEL every part of proportions – students often get lost in what the numbers represent.

Sharing Between Two People
- 7-8 graders should not have a problem with this portion. If they do, you know you need to spend more time developing the concept rather than jumping into the arithmetic processes. There are plenty of opportunities during the regular curriculum for this.

Sharing Between Six People
- One stumbling stone could be the comparison of proportional unit costs of halves and sixths. Simply set up proportions for students to see the difference, and be sure to label each number in the proportions.

Snack Operations (optional)
- If your students do not yet understand percent of decrease, don't do this now, but collect the BLMs and come back at a later time to complete.

Circulate the room while students are working on the BLM, asking questions as needed to guide, redirect, and extend.

Finally, let them enjoy their snack.

Snack Fraction Journal Writing: BLM Snack Bag Snack Fractions
Explain how to find the percent of the snack $\frac{1}{6}$ represents.

Objectives: Review the objectives with the class, making sure they understand how they achieved each.

Unit 4 Lesson 2 – Snack Fractions
One per student

Snack Bag – Snack Fractions

Share Between Two People

Write a fraction representation of your snack portion: _____

Write a decimal representation of your snack portion: _____

What percent of the snack is your portion? _____

There are _____ snack bags in the room. The total cost for all the snacks was _____

What is the ratio of snacks to students? _____

What is the cost of each student's portion of the snack? _____

Sharing Between Six People

Write a fraction representation of your snack portion: _____

Write a decimal representation of your snack portion: _____

What percent of the snack is your portion? _____

Refer to the number of snacks in the room and the actual cost based on sharing with a partner. How would sharing the snack among six students have changed the proportion of snacks to students, the number of snacks that would have been purchased for the group, and the total cost of the snack?

Snack Operations
By what percent would your portion decrease if you shared with six people rather than with a partner?

_____

Unit 4 Lesson 2 – Snack Fractions

One per student

Snack Bag – Snack Fractions

Compartir entre dos personas

Escribe una representación fraccioinaria de tu porción: _____

Escribe una representación decimal de tu porción: _____

¿Qué porcentaje del refrigerio es tu porción? _____

Hay _____ bolsas de comida en el salón de clase. El costo total de la comida fue _____

¿Cuál es la relación de refrigerios a estudiantes? _____

¿Cuál es el costo de la porción de refrigerio de cada estudiante? _____

Compartir entre seis personas

Escribe una representación fraccioinaria de tu porción: _____

Escribe una representación decimal de tu porción: _____

¿Qué porcentaje del refrigerio es tu porción? _____

Considera el número de refrigerios en el salón de clase y el costo real basado en compartir con un compañero.
¿Cómo habrían cambiado la proporción de refrigerios a estudiantes, el número de refrigerios que se habrían comprado para el grupo y el costo total del refrigerio si se hubieran compartido los refrigerios entre seis estudiantes?

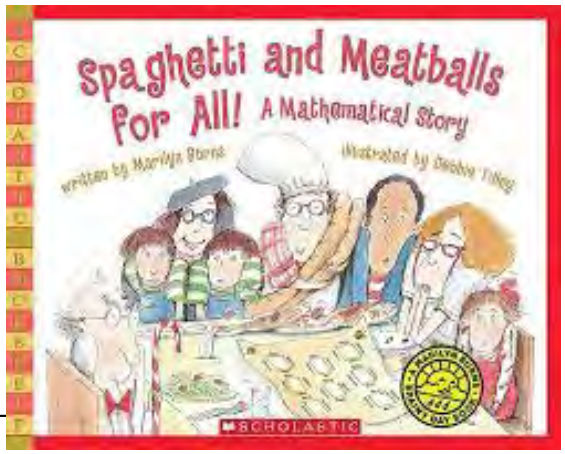
Operaciones con refrigerios

¿En qué porcentaje disminuiría tu porción si compartieras con seis personas en vez de con un compañero? By what percent would your portion decrease if you shared with six people rather than with a partner?

_____

Unit 4 Lesson 2 – Family Fun

Dear _____,



The math strategy we used today was…

_____

_____

I think that will be helpful when I…

_____

_____

_____

One thing I'd like to do at home using this math with the family is…

_____

_____

_____

Sincerely,

_____

Unit 4 Lesson 2 – Family Fun

Querido_____,

La estrategia que usamos en la clase de mathematics hoy fue:

_____
_____

Será útil cuando…

_____
_____
_____

Una cosa que me gustaría hacer con esta estrategia en casa con la familia es…

_____
_____
_____

Sincerely,

_____

Materials
- **BLM** Models and Designs-Measurement Lab Record Sheet
- **BLM** Solve It! Problems 3-4
- **BLM** Fraction Action and *X* Marks the Spot
- **BLM** Lessons 2-3 CGI ***Spaghetti and Meatballs for All***

Math Objectives
- Solve word problems using a variety of strategies and defend strategies.
- Model and solve 3-step word problems.
- Compose and decompose values to show a new representation of the value.
- Find equivalent fractions.

Language Objectives
- Speak to partners, teacher, and class using vocabulary.
- Discuss problem solving process and strategies.
- Explain method used to rename the target number.

Math Vocabulary
scale factor
similarity
similar
proportion
ratio

Literature Vocabulary
comfort
tending
stretched
reunion
banquets
balancing
arrival
relatives

Unit 4, Lesson 3 Grades 7-8

Daily Routine

The following daily activities will help prepare your students for the Post-assessment. They are not optional.

ESSENTIAL

Measurement Lab
- Lesson 1 – omit
- Lesson 2 – area
- **Lesson 3 – similar figures**

Lesson 3 Materials
- **BLM** Models and Designs

Lesson 3 Student Groups
- Answer questions on **BLM** Models and Designs

Solve It! Multi-step problem solving
- Lesson 1 – omit
- Lesson 2 – pairs, 3-step problem
- **Lesson 3 – pairs, 3-step problem**

Fraction Action
- Lesson 1 – omit
- Lesson 2 – BLM Fraction Action and X Marks the Spot
- **Lesson 3 – BLM Fraction Action and X Marks the Spot**

***X* Marks the Spot**
- Lesson 1 – omit
- Lesson 2 – BLM Fraction Action and X Marks the Spot
- **Lesson 3 – BLM Fraction Action and X Marks the Spot**

CGI
- Lesson 1 – omit
- Lesson 2 – rate, multiplication (assessment item 7)
- **Lesson 3 – price, partitive (assessment item 6)**

Assessment Items As a result of this unit, students will be prepared for the following assessment items: 2, 3, 4, 5, 6, 7 **TEKS for this Unit** 7th – 7.2D, 7.3B, 7.4B, 8th – 8.2D, 8.6AB	**Unit 4, Lesson 3** **Grades 7-8** **Daily Routine** - continued  **----------** **The following activities, although certainly developmentally appropriate for your 7th and 8th grade students, do not specifically address objectives assessed on the Post-assessment. Schools with shorter teaching spans can consider omitting some or all these activities as your time permits.** **----------** **OPTIONAL** **Target Number** • Lesson 1 – omit • Lesson 2 – Target Number 15 • **Lesson 3 – Target Number 45** **Money Matters** (*If you have a full program and wish to use this optional activity, you will find BLMs and Explanations in the Optional Activities Tab of your Teacher's Guide*.)

Unit 4 Lesson 3 – Daily Routines – Measurement Lab

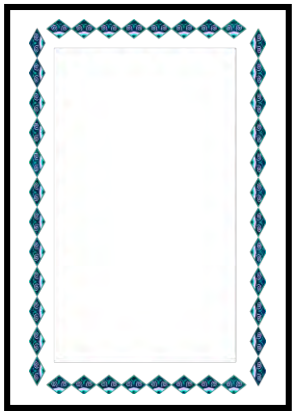
One per student

Models and Designs – Measurement Lab Record Sheet

You are a stained glass window designer. The projects below are your creation. Read each problem carefully, using your ruler and the illustration to help you solve each,

Width:

Length:



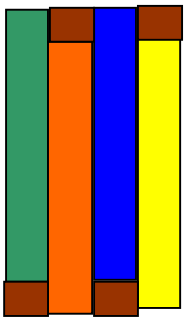
The design to the left is your model for a piece of a larger design. When finished, the stained glass will need to be framed and hung inside another larger window to reflect the light.

The frame for this piece will need to be 7.5 inches wide. If the frame is similar, how long will the frame be?

This illustration to the right is a stained glass window that you designed.

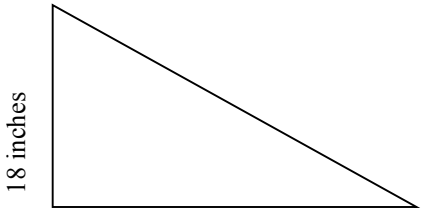
You purposely placed the window so that it would reflect on the floor in a similar pattern to those in the window.

The large rectangles in the window measure 12 inches long and 2 inches wide. What is the width of the entire reflected rectangle if the length of the reflection is 60 inches long?



The model to the left is your beginning sketch of a staircase you designed.

The actual staircase was built with a SCALE FACTOR of 40. How many feet tall was the actual staircase?



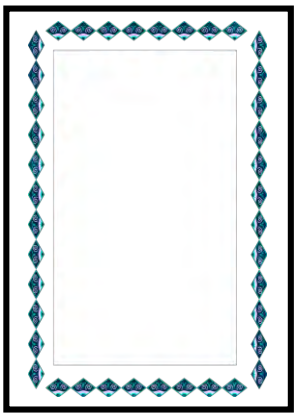
Unidad 4

Lección 3 – Rutinas diarias, laboratorio de Medidas – Modelos y Diseños (Uno por estudiante)

Eres un diseñador de ventanas con vitrales. Los proyectos debajo son tu creación. Lee cada problema cuidadosamente, usando una regla y la ilustración para ayudarte a resolver cada uno.

Ancho:

Largo:



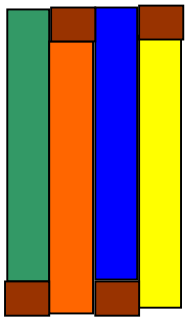
El diseño de la izquierda es tu modelo para una pieza de un diseño más grande. Cuando esté terminado, el vitral deberá enmarcarse y colgarse dentro de una ventana más grande para reflejar la luz.

El marco para esta pieza tendrá que ser de 7.5 pulgadas de ancho. Si el marco es similar, ¿Qué tan largo deberá ser?

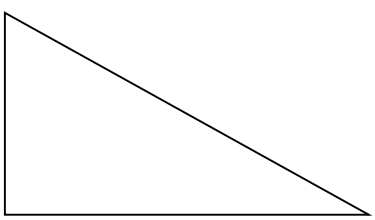
La ilustración a la derecha es un vitral que tú diseñaste.

Colocaste la ventana con el propósito de que se reflejara en el piso con un patrón similar al de la ventana.

Los rectángulos grandes en la ventana miden 12 pulgadas de largo y 2 pulgadas de ancho. ¿Cuál es el ancho del rectángulo completo reflejado si la longitud del reflejo es de 60 pulgadas de largo?



18 pulgadas



24 pulgadas

El modelo de la izquierda es tu dibujo inicial de unos escalones que diseñaste.

El escalón real fue construido con un FACTOR DE ESCALA de 40. ¿De cuántos pies de alto quedaron las escaleras reales?

Unit 4 Lesson 3 – Daily Routines - Solve It! Problems (Pairs)

One per student

Solve your own problem today, showing your work. Verify your partner's solution when you both finish your own. Discuss your work.

Partner #1 - Problem 3:

Martin charges a flat rate of $75 per lawn, plus $20 an hour over 4 hours of work. He also charges a clean-up fee of $5.00 per bag if he has to remove bags of rubbish to the dump. Mr. Herrera had a really big yard that took Martin 8.5 hours to complete, and Martin had 21 bags of leaves and grass clippings to remove. What did Martin charge Mr. Herrera for the job?

Problem Solution Name:	**Solution Verification** Name:

Unit 4 Lesson 3 – Daily Routines - Solve It! Problems (Pairs)

One per student

Hoy, resuelve tu propio problema, mostrando el procedimiento. Verifica la solución de tu compañero cuando ambos terminen de hacerlo por sí mismos. Hablen sobre su trabajo.

Compañero # 1 - Problema 3:

Martin cobra una tarifa fija de $75 por cada servicio de mantenimiento de césped, más $20 por hora por más de 4 horas de trabajo. Además, cobra una tarifa de limpieza de $5.00 por bolsa si tiene que llevar bolsas de basura hasta el vertedero. El Sr. Herrera tenía un jardín muy grande, y a Martin le llevó 8.5 horas terminar su trabajo. Martin tenía 21 bolsas de hojas y césped cortado para retirar. ¿Cuánto le cobró Martin al Sr. Herrera por el trabajo?

Solución del problema Nombre:	**Verificación del problema** Nombre:

Unit 4 Lesson 3 – Daily Routines - Solve It! Problems (Pairs)

One per pair

Solve your own problem today, showing your work. Verify your partner's solution when you both finish your own. Discuss your work.

Partner #2 - Problem 4:

Martin knows that cleaning gutters can take all day, and he'll have lots of bags of yard rubbish to take to the dump. He has a flat charge of $225, which includes cleaning the gutters, washing down any sidewalks or patios affected by the gutter cleaning and hauling away 20 bags of yard rubbish. Mrs. Merriweather had a very small house. Martin gave her a 30% discount for the job. She gave Martin a 15% tip on the discounted price. How much less did Martin make than the $225 he usually charges for gutters?

Problem Solution Name:	**Solution Verification** Name:

Unit 4 Lesson 3 – Daily Routines - Solve It! Problems (Pairs)

One per pair

Hoy, resuelve tu propio problema, mostrando el procedimiento. Verifica la solución de tu compañero cuando ambos terminen de hacerlo por sí mismos. Hablen sobre su trabajo.

Compañero # 2 - Problema 4:

Martin sabe que limpiar canaletas le puede llevar un día entero, y tendría muchas bolsas de basura para llevar al vertedero. Tiene una tarifa fija de $225, en la que incluye limpiar las canaletas, lavar cualquier acera o patio afectados por la limpieza de la canaleta y depositar 20 bolsas de desechos de césped. La Sra. Merriweather tenía una casa muy pequeña. Martin le hizo un 30% de descuento por el trabajo. Ella le dio a Martin una propina del 15% sobre el precio descontado. ¿Cuánto dinero menos ganó Martin de los $225 que normalmente cobra para las canaletas?

Solución del problema Nombre:	**Verificación del problema** Nombre:

Unit 4 Lesson 3 – Daily Routines – Fraction Action and *X* Marks the Spot

One per student

Fraction Action

Materials:
None for this activity

Task:

Maria's pickle recipe called for $\frac{1}{4}$ cup of vinegar per 10 cups of water for 5 pounds of cucumbers.

If she only had 1 pound of cucumbers, how much vinegar and water did she need?

X Marks the Spot

Write an equation for each of the statements.

Monty earns $12 an hour walking dogs which is $3 more than a third as much as he does painting houses.	At the Middle School Dance, the students danced 12 slow dances, which was 6 less than half the number of fast dances.

Unit 4 Lesson 3 – Daily Routines – Fraction Action and *X* Marks the Spot

One per student

Fraction Action

Materiales:
Ninguno para esta actividad

Tarea:

La receta de pepinillos de María lleva $\frac{1}{4}$ taza de vinagre por 10 tazas de agua por 5 libras de pepinos. Si solo tiene 1 libra de pepinos, ¿cuánto vinagre y agua necesita?

X Marca el sitio

Escribe una ecuación para cada oración.	
Monty gana $12 por hora por pasear perros, lo que es $3 más que un tercio de lo que hace pintando casas.	En el baile de la escuela intermedia, los estudiantes bailaron 12 canciones lentas, lo que fue 6 menos que la mitad del número de bailes rápidos.

Materials
- class set of vocabulary cards
- **BLM** Silly Association Gallery Walk Discussion
- **BLM** King of the Mountain-Game Instructions (Lesson 2)
- King of the Mountain Game Board
- game markers
- dominoes (1 set per pair)
- graph paper
- scratch paper

Literature Selection
Spaghetti and Meatballs for All
by Marilyn Burns

Math Vocabulary
scale factor
similarity
similar
proportion
ratio

Literature Vocabulary
comfort
tending
stretched
reunion
banquets
balancing
arrival
relatives

ELPS *(English Language Proficiency Standards):*
2D, 2I, 3C, 3J, 4F, 4I

Unit 4, Lesson 3 — Grades 7-8

Classroom Lesson

Every day teachers must post the objectives on the board, read them to the students, and have students read them together with the teacher. At the end of the lesson, teacher and students should review to see if they have accomplished both math and language objectives.

Math Objectives:
- Solve similarity problems using any strategy including scale factor and equivalent ratios.

Reading Objective
- Find text evidence for the trait that best describes a character.

Language Objectives:
- Use a Gallery Walk as an opportunity to discuss similarities and differences between your understanding of the vocabulary words and other students' understandings.
- Explain how to find scale factors and use them to solve similarity problems.
- Analyze character traits from author's clues and illustrations.

BEFORE READING
Practice and Application - Vocabulary
In Lesson 2 we created these wonderful Silly Association Posters. Today you are going to take a Gallery Walk to view and discuss the posters. We'll divide into groups of three. (*Use a group of four if you need to balance the class, but threes work better.*) Each of you will need a pencil and notebook to use as you walk along the gallery, talk to one another about the associations that seem to be made in the poster.

- Write the Silly Association sentence on the record sheet.
- What is the first thing that strikes you about the poster?
- What associations seem to be made in the sentence? The art work?
- How is this poster different from your understanding of the words used?
- How is this poster similar to your understanding of the words used?
- What positive comment or clarifying question would you like to share with the creator of the poster?

As a group, you are not to visit the posters that your members made. You will have 15 minutes to browse the gallery. Take your time, talk softly to one another as if you are in an art gallery. You are not expected to view all of the posters. Please select a poster that is not being viewed. We will gather in 15 minutes. You may begin.

Classroom Lesson - continued

Language Center
Student should continue creating Visual-Verbal Word Association Charts for different literature vocabulary words from this unit, and adding them to their binders. Make sure students are able to reference the word wall with the student-friendly definitions to fill in that part of the chart.

At the end of 15 minutes, call the students back to their seats.

- *Ask students to share some of their insights from the gallery walk.*
- *What did they learn about their classmates as they viewed their posters?*
- *Were any of their understandings of words deepened through walking the gallery? How?*
- *What were some of the positive comments they would like to share with the artists?*
- *What are some comments about the activity?*

Guess My Word Activity
Tell students that they are going to use their new deepened understanding of the vocabulary words to play a word game, "Guess My Word." One person will be "it" and think of a word from one of the units that is on the word wall.

Students are to ask questions that can be answered YES or NO to guess the word. *(similar to 20 questions)*

They must ask questions in such a way that the guess is the only reasonable answer. And no one can make a guess until the questions have led you to the answer.

Display the following on the board. Questions may be about:

- Part of speech *(Is the word a noun?)*
- Tense *(Is the word in the past tense?)*
- Meaning *(Does the word mean "on the property?")*
- Synonym (*Is _____ a synonym for your word?)*
- Antonym *(Is _____ an antonym for your word?)*
- Unit (*Was the word from unit _____?)*
- Questions may NOT be about sounds in the words *(initial, blends, ending, etc.)*.
- Make a guess when the word is the only possible choice.
- Frame your guess as a question: Is your word _____*?*

Playing the Game:
Begin the game by modeling. Ask a student to select one of the words on the word wall and not tell anyone what that word is, but to write it on a piece of paper to show at the end of the game. You begin the questioning. Remember, ask only questions that can be answered with YES or NO. If someone asks a question that doesn't qualify, simply say, "Sorry, that question cannot be answered with YES or NO."

Encourage the students to ask questions, too, so that you can model the orderly fashion of the game. Hands raised – ask question only when acknowledged.
Once the word is obvious, model the question: Is your word *(your guessed word)*?
Play the game as a class until all words have been identified.

Mini Unit
Character Analysis
http://homeworktips.about.com/od/writingabookreport/a/characteranalysis.htm

DURING READING
Building Background - Literature
Tell students that the author has created characters to act in a certain way. You can find hints of their character in the character's description, the dialog, the interaction with other people, and the illustrations.
Today we will investigate several of those characters:
Mrs. Comfort, Mr. Comfort, The Comfort's daughter, and
Mr. Comfort's father.

Explain that they will read ***Spaghetti and Meatballs for All*** with their partner. While they are reading they will **use sticky notes** to mark the places in the text that give evidence of the character's trait. Model this for students.

Give each student a copy of the book from the classroom set, and a few sticky notes. *(You may want to stick a small stack on the front cover of each copy of* ***Spaghetti and Meatballs for All*** *ahead of time.)*

Give students sufficient time to read the book with their partner. Students can alternate reading pages, or they may want to chorally read each page together. This provides more support for ELLs.

Partners should be spread out in the room so the reading aloud doesn't disturb them. Anyone who finishes early can go back and reread the parts where they found text evidence.

ELLs: You can have beginning ELLs in groups of three so they can listen to the other two students read aloud ***Spaghetti and Meatballs for All***. All students should mark their books with sticky notes. Encourage ELLs to use Spanish to better express their understandings about how the text evidence shows a particular trait.

AFTER READING
Reading Response activity
1. Gather the class together after the partner reading activity.

2. Ask different partners to share what text evidence they found for the character and the trait they chose. How does that text evidence show that particular trait?

Unit 4, Lesson 3 — Grades 7-8

Classroom Lesson - continued

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3. Model for students how to take this text evidence and write a reading response *(a paragraph)*. Example structure for the response:

In ***Spaghetti and Meatballs for All***, _____is _____. *(Then, provide several sentences explaining the text evidence that best reveals this character's trait. Cite specific things the character said, how the character said those things, specific things the character did, ways the character reacted, how the character looked, etc.)*

4. Have partners work together to create a reading response about the character and trait they chose. Remind students to use your response *(displayed)* as a guide for their own writing. They should follow a similar structure.

As they work, circulate the room asking questions:

- I see that you feel *(character)* is *(trait)*. What in the story led you to that conclusion?
- Tell me what you are thinking. How can you express that in your writing?

Transition to Math

Play King of the Mountain from Lesson 2.

Objectives

Review both language and math objectives, making sure students understand how they accomplished each.

Unit 4

Lesson 3 – Classroom Lesson – Gallery Walk Discussion (5 per student)

Silly Association sentence: _____

What is the first thing that strikes you about the poster?

What associations seem to be made in the sentence?

……the art work?

How is this poster different from your understanding of the words used?

How is this poster similar to your understanding of the words used?

What positive comment or clarifying question would you like to share with the creator of the poster?

Unidad 4

Lección 3 – Lección de Salón de Clases – Discusión de Caminata por la Galería (5 por estudiante)

Frase tonta de asociación:

_____

¿Qué es lo primero que te llama la atención del poster?

¿Qué asociaciones parecen haberse hecho en la oración?

……¿El arte?

¿Cómo difiere este poster de tu entendimiento de las palabras usadas?

¿En que es similar este poster a tu entendimiento de las palabras usadas?

¿Qué comentario positivo o pregunta aclaradora te gustaría compartir con el creador del poster?

Materials
- **BLM** Thinking Smaller
- ruler

Math Vocabulary
scale factor
similarity
similar
proportion
ratio

Literature Vocabulary
comfort
tending
stretched
reunion
banquets
balancing
arrival
relatives

ELPS *(English Language Proficiency Standards):*
2C, 2E, 2F, 3D, 3E, 3J, 4F, 5G

Unit 4, Lesson 3 — Grades 7-8

Math Lesson

Math Objectives:
- Use any strategy to determine the dimensions of a model using a specified scale factor.
- Make a visual representation to solve scale factor (model) problems.

Language Objectives:
- Discuss problems solving strategies with peers.
- Write solutions for solving the model problem.
- Explain how to make a model using a specified scale factor.

Building Background
We've been using SCALE FACTORS that make similar 2-dimensional shapes. But when an architect creates a model, he/she actually has to think in 3-dimensions. They think about the finished product, the building dimensions, then scale down, or reduce the size to a workable model. We're going to think 3-D smaller today.

Comprehensible Input
Look carefully at the question on the **BLM** Thinking Smaller.
- What is the SCALE FACTOR? $(\frac{1}{10})$
- Will the model be larger or smaller than the original? *(smaller)*
- How do you know? *(You will be multiplying by 1/10. When you take one-tenth of something, you only have a small portion of it.)*

Let's work through this Thinking Smaller problem sheet together.

- What does the paper tell you this rectangle under the cabin represents?
  - *The rectangle under the log cabin represents the dimensions of the floor of the cabin.*
- Where can you find the data that tells you the dimensions of the cabin?
- What are the dimensions of the log cabin? *(30 feet long and 20 feet wide)*

Look back at that rectangle again. Each little mark represents one foot. Let's label the length *(30 ft.)* and width *(20 ft.) (do so).*

- What is it that I want to find? *(model dimensions based on scale factor)*
- What is my SCALE FACTOR? $(\frac{1}{10})$

Discuss how you will determine the dimensions of the scale model with the data we have. (*pause for discussion)*

One way is to take one-tenth of the known measurements. How would you translate ONE-TENTH OF KNOWN MEASUREMENTS into a number sentence?

I'm going to start with the known measurement, **width**. The **width** is 20 feet. So…

(scale factor)	x	(known measurement)	=	(model measurement)
$(\frac{1}{10})$	**x**	**20 ft.**	**=**	**$\frac{20}{10}$**

When multiplied algorithmically students must then perform the operation of division *(20 ÷ 10)* to find the new model measure. This is certainly acceptable. However, remind students that they learned very valuable mental math skills in the percent unit in regards to finding one-tenth *(or 10%)* of something. A scale factor of *$(\frac{1}{10})$* is no different than saying "the model cabin will be 10% of the size of the actual cabin." Practice your mental math skills in this problem:

What is *$(\frac{1}{10})$* of a group of 20 feet?

(2 - Students can think of a decimal moving left one place value spot, or of breaking 20 into 10 equal pieces.)

Let's make sense of our answer of 2. What does that number represent? *(It represents the width of our scale model.)*

So, our model's width would be 2 feet. *(Place a heavy pencil mark on the 2 ft. mark in the upper left hand corner on the width of the cabin floor. You are going to "draw" the dimensions of the scaled model in that corner.)*

Length: *(30 feet)*

(scale factor)	x	(known measurement)	=	(model measurement)
$(\frac{1}{10})$	**x**	**30 ft.**	**=**	**$\frac{30}{10}$**

Use your mental math skills to calculate one-tenth, or 10%, of 30 feet. 30 divided equally into 10 pieces = ???? *(3 feet)* So our model's length will be 3 feet. *(Place a heavy pencil mark on the 3 ft. mark in the upper left hand corner on the length side of the cabin floor.)*

Teacher Note
With compatible numbers like these, it isn't necessary to walk through tedious algorithms unless the procedure is the focus. The concepts of scale factors, percentages, ratios, and similarity are the focus of this lesson, so it is recommended students practice their mental math skills while working the problems.

Math Lesson - continued

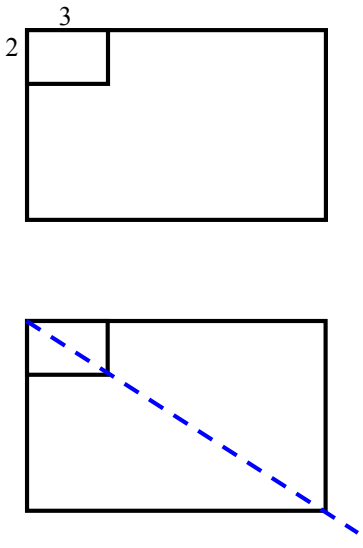
Now draw the 2 x 3 rectangle in the corner, using your ruler so that you have straight lines. What part of the cabin have we just drawn? *(the floor from a birds-eye view)*

There's a way to test figures for proportionality. When you are working on the computer and you need to enlarge or shrink a picture, what do you do? *(There are several ways to accomplish this but the most common is to click the picture, and then drag your mouse, either out or in, to achieve your desired result. Dragging out maximizes the picture, and dragging in minimizes it.)*

Technology Option
Demonstrate dilating (zooming in) or contracting (zooming out) a picture on a projector screen if available. Students should pay close attention to the "line" your mouse follows.

Next time you resize a picture on the computer pay close attention to the "line" that your mouse makes when moving inward or outward. That line is real and created mathematically when a scale factor is present. Therefore, proportional figures *(similar figures)* will have a straight "line of dilation" so to speak.

For instance, the larger rectangle on your graph reflects the length and width *(in feet)* of the actual cabin. *(20 x 30)* You sketched the scaled down measurements in the corner. *(2 x 3)* Both figures share an origin point in the upper left corner. If the figures are proportional then a "line of dilation" will cut through BOTH rectangles from the origin to its diagonal vertex.



Have students test their rectangles for proportionality using their rulers as a straight edge. Mark the diagonal line. Did it cut through corresponding points? *(yes)*

Now you can use this test to make sure your scaled drawings are proportional to the original measurements. There are more measurements to find before we can build that model. Let's get started.

(Continue finding the measures of the reduced model and completing the Thinking Smaller sheet. Students should be working with you, so do give time for them to compute.)

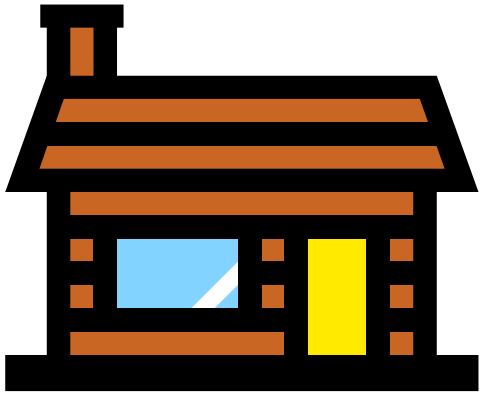
MAS Space
Create your own design model that you intend to either enlarge or reduce. Share your model and work together to figure out how small or large the actual design would be!

Objectives:
Read through the math and language objectives, making sure that students understand how they accomplished each.

Unit 4 Lesson 3 – Math Lesson

One per student

Thinking Smaller



Work with your teacher and class to complete the activity.

This is a little one-room cabin in the woods. The floor measures 20 feet by 30 feet, and it is 9 feet tall at the peak. The chimney is 3 feet by 3 feet square and 2 feet tall.

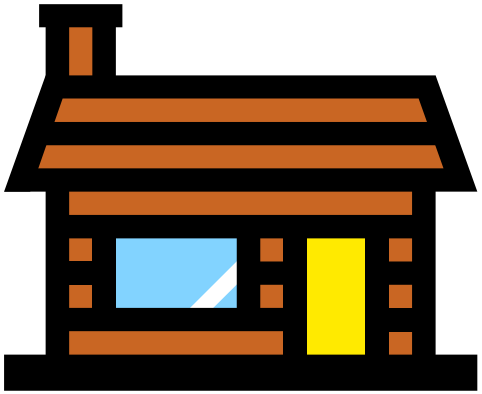
If you were going to make a model of this cabin to a SCALE FACTOR of $\frac{1}{10}$, what would all of the dimensions be? Show your work in the space provided. Fill in the chart.

When the scale factor is a fraction, I know that the new scaled dimensions will be (smaller or larger) than the original because…

	floor plan			chimney		
	length	width	height	length	width	height
life sized						
scale model						

Unit 4 Lesson 3 – Math Lesson

One per student



Thinking Smaller

Work with your teacher and class to complete the activity.

Esta es una pequeña cabaña de una sola habitación en el bosque. El piso mide 20 pies por 30 pies, y la cabaña tiene 9 pies de alto en la cima. La chimenea es de 3 pies por 3 pies cuadrados y 2 pies de alto.

Si vas a hacer un modelo de esta cabaña en un FACTOR ESCALA de 1/10, ¿Cuáles serían las dimensiones? Muestra tu trabajo en el rectángulo abajo.

Cuando el factor escala es una fracción, yo sé que las dimensiones a escala serán más (pequeñas/grandes) que el original porque:

	Cabaña modelo			**chiminea**		
	largo	ancho	alto	largo	ancho	alto
life sized						
scale model						

Materials
- Sears Tower article
- **BLM** Thinking Smaller-Sears Tower
- Family Fun Generic Game Board
- Family Fun Movement cards
- Unit 4 Family Fun-Problem Cards
- Family Fun Answer Key from Unit 1 (all grade bands)
- Unit 4 Family Fun Special 7th – 8th Game Instructions
- game markers
- **BLM** Recursive Review Problems Lessons 1-3

Math Vocabulary
scale factor
similarity
similar
proportion
ratio

Literature Vocabulary
comfort
tending
stretched
reunion
banquets
balancing
arrival
relatives

Unit 4, Lesson 3 — Grades 7-8

Follow-up

Math Objectives:
- Use any strategy to determine the dimensions of a model using a specified scale factor.
- Make visual representations to help solve scale factor (model) problems.

Language Objectives:
- Discuss problem solving strategies with peers.
- Write out solutions for solving the model problem.
- Explain how to make a model using a specified scale factor.
- Write an explanation to determine whether a scale factor is enlarging or reducing an object.

Practice and Application
Students work in teams to solve the Thinking Smaller, Sears Tower sheet. The configuration of the nine tubes is just an option – it is not the actual configuration; although the measures of the tubes are correct.

QUESTIONS
- Explain your strategy for solving the problem.
- What is the SCALE FACTOR used to determine the new dimensions?
- What is this question asking you to do?

Recursive Review
*Use **BLM** Recursive Review Problems found in Lesson 1.*

- Gary's dinner bill at the restaurant was $42.95. If he leaves the server a 20% tip, how much will his bill be altogether?

Writing Topics
Independent Writing Topic
Students will have a daily writing activity that will incorporate the day's focus math vocabulary.

- **Explain how you know whether you are reducing or enlarging a figure by looking at the scale factor.**

Family Fun Game
Students will take the Family Fun game materials home to teach and play with their families.

Objectives
Review the math and language objectives to make sure that they were accomplished and that the students realize how they were accomplished.

Unit 4 Lesson 3 – Follow-up
One per student

Sears Tower Article

Sears Tower – Chicago, IL

The Sears Tower, now called the Willis Tower under new owners, is a beautiful landmark in Chicago. Construction started in 1970 and was completed in 1973. It is 1454 feet tall and weighs a whopping 445,000,000 pounds! An observation deck at 1,353 ft., is the highest observation point in Chicago, and a very popular attraction. When it was built, the Sears Tower was the tallest building in the world, and maintained that title until 1997 when the Petronas twin towers in Malaysia were constructed. Today the tallest building in the world is the Burj Dubai in Dubai. If you watched the movie Mission Impossible 4, you saw Tom Cruise trying to walk up that building.

The Sears Tower is constructed of 9 square steel tubes, each measuring 75ft x 75ft and arranged in groups of threes. The height of the Tower is 1730 feet from street level to the top of the tallest antenna.

Unit 4 Lesson 3 – Follow-up
One per student

Sears Tower Article

Sears Tower – Chicago, IL

La Torre Sears, ahora llamada la Torre Willis por los nuevos dueños, es un hermoso lugar muy conocido en Chicago. Su construcción comenzó en 1970 y se completó en 1973. Tiene 1454 pies de alto y ¡pesa 445,000,000 libras! Un observatorio a los 1,353 pies, es el punto más alto de observación en Chicago, y una atracción muy popular.
Cuando se construyó, la Torre Sears era el edificio más alto del mundo, y mantuvo ese título hasta 1997 cuando se construyeron las torres gemelas Petronas de Malasia. Hoy en día, el edificio más alto del mundo es el Burj Dubái en Dubái. Si viste la película Misión Imposible 4, viste a Tom Cruise tratando de caminar hacia arriba de ese edificio.

La Torre Sears está construida con 9 tubos cuadrados de acero, cada uno midiendo 75 pies x 75 pies y acomodados en grupos de tres. La altura de la Torre es de 1730 pies desde el nivel de la calle a la punta de la antena más alta.

Unit 4 Lesson 3 – Follow-up

One per student

Thinking Smaller – Sears Tower

Work with a partner or group and use the information from the article to complete this activity.

Scale Model

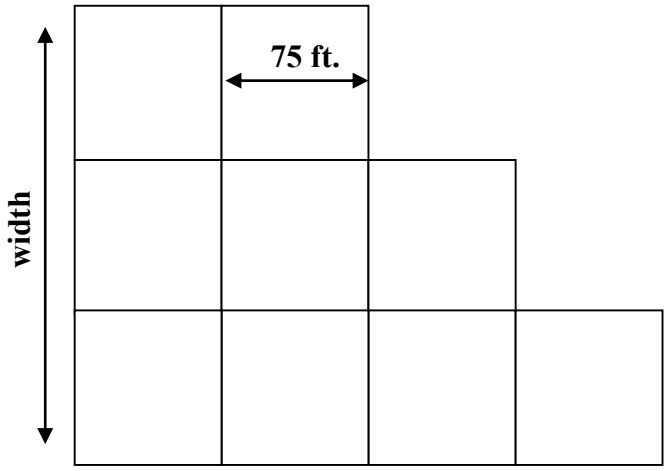
If you were to make a model of the Sears Tower using a scale factor of $\frac{1}{25}$, the dimensions would be:

- Tubes _____ x _____
- The perimeter of each tube _____
- The perimeter of configuration shown in figure _____
- The height to the top of the tallest tower _____

Actual Tower

This is one possible configuration of the 9 tubes. If each tube on the Sears Tower is a 75 foot square, what is the:

- The perimeter of each tube _____
- The perimeter of configuration shown in figure _____
- The width of the configuration at its longest point _____
- The length of the configuration for 2 tubes _____
  3 tubes _____
  4 tubes _____



Unit 4 Lesson 3 – Follow-up

One per student

Thinking Smaller – Sears Tower

Work with a partner or group and use the information from the article to complete this activity.

Modelo a Escala

Si fueras a hacer un modelo a escala de la Torre Sears usando un factor escala de $\frac{1}{25}$, cuáles serían las dimensiones de:

- Tubos _____ x _____
- el perímetro de cada tubo: _____
- el perímetro de la configuración de los tubos según se muestra debajo: _____
- la altura a la parte más alta de la torre más alta _____

Torre Real

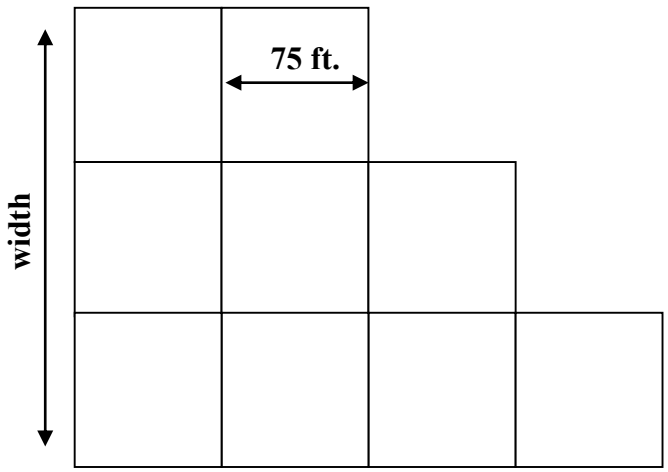
Esta es una posible configuración de los 9 tubos. Si cada tubo en la Torre Sears es un cuadro de 75 pies, cuál es el:

- perímetro de cada tubo: _____
- perímetro de la configuración: _____
- el ancho de la configuración en su punto más largo _____
- largo de la configuración para:

  2 tubos _____

  3 tubos _____

  4 tubos _____



Materials
- 3 graham crackers (whole sheets)
- 2T peanut butter ***Allergy Warning – please substitute a different spread for the entire class if nut allergies are present.***
- 2 paper dessert plates
- 2 paper towels
- 2 plastic knife

All items listed above per partner pair
- **BLM** Crackers and Peanut Butter-Snack Fractions

Math Objectives
- Use addition, subtraction, multiplication and division to solve problems involving fractions and decimals.
- Convert between fractions, decimals, whole numbers and percents.
- Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios).
- Estimate and find solutions to application problems involving percent.

Language Objectives
- Discuss how ratios and proportions can be used to solve real-world problems.

Math Vocabulary
scale factor
similarity
similar
proportion
ratio

Literature Vocabulary
comfort
tending
stretched
reunion
banquets
balancing
arrival
relatives

Unit 4, Lesson 3 — Grades 7-8

Snack Fractions

Students should wash their hands before this activity if using food items.

Snack Fractions
Students should have the skills to answer these in small groups. Have the students work through the BLM before sharing the actual snack.

The strategies suggested are certainly not the only strategies that could be used to solve the unit rate and proportion problems, but are helpful to students who don't yet understand the short cuts.

Please be sure to LABEL every part of proportions – students often get lost in what the numbers represent.

Sharing Between Two People
- 7-8 graders should not have a problem with this portion. If they do, you know you need to spend more time developing the concept rather than jumping into the arithmetic processes. There are plenty of opportunities during the regular curriculum for this.

Sharing Between Eight People
- One stumbling stone could be the comparison of proportional unit costs of halves and sixths. Simply set up proportions for students to see the difference, and be sure to label each number in the proportions.

Snack Operations (optional)
- If your students do not yet understand percent of decrease, don't do this now, but collect the BLMs and come back at a later time to complete.

Circulate the room while students are working on the BLM, asking questions as needed to guide, redirect, and extend.

Snack Fraction Journal Writing: BLM Crackers and Peanut Butter Snack Fractions
How do you think the unit cost of the snacks would be affected when sharing in fourths to sharing in eighths? Justify your answer.

Objectives: Review the objectives with the class. Make sure they understand how they achieved each.

Unit 4 Lesson 3 – Snack Fraction

One per student

Crackers and Peanut Butter – Snack Fractions

Share Between Two People

Write a fraction representation of your snack portion: _____

Write a decimal representation of your snack portion: _____

What percent of the snack is your portion? _____

There are _____ snack bags in the room. The total cost for all the snacks was _____

What is the ratio of snacks to students? _____

What is the cost of each student's portion of the snack? _____

Sharing Between Eight People

Write a fraction representation of your snack portion: _____

Write a decimal representation of your snack portion: _____

What percent of the snack is your portion? _____

Refer to the number of snacks in the room and the actual cost based on sharing with a partner. How would sharing the snack among six students have changed the proportion of snacks to students, the number of snacks that would have been purchased for the group, and the total cost of the snack?

Snack Operations

By what percent would your portion decrease if you shared with six people rather than with a partner?

_____

Unidad 4 Lección 3 – Fracciones de refrigerios

Una por estudiante

Galletas saladas y mantequilla de maní – Fracciones de refrigerios

Compartir entre dos personas

Escribe una representación en fracciones de tu porción de refrigerio: _____

Escribe una representación decimal de tu porción de refrigerio: _____

¿Qué porcentaje del refrigerio es tu porción? _____

Hay _____ bolsas de refrigerios en el salón de clase. El costo total de todos los refrigerios fue de _____

¿Cuál es la relación de refrigerios a estudiantes? _____

¿Cuál es el costo de la porción de refrigerio de cada estudiante? _____

Compartir entre ocho personas

Escribe una representación en fracciones de tu porción de refrigerio: _____

Escribe una representación decimal de tu porción de refrigerio: _____

¿Qué porcentaje del refrigerio es tu porción? _____

Considera el número de refrigerios en el salón de clase y el costo real basado en compartir con un compañero.

¿Cómo habrían cambiado la proporción de refrigerios a estudiantes, el número de refrigerios que se habrían comprado para el grupo y el costo total del refrigerio si se hubieran compartido los refrigerios entre seis estudiantes?

Operaciones con refrigerios

¿En qué porcentaje disminuiría tu porción si compartieras con seis personas en vez de con un compañero?

_____

Unit 4 Lesson 3 – Family Fun

Dear _____,

We learned a few more skills in math involving similar figures and scale factor!

Here are some strategies I'll need to solve the problems in this unit's game today…

_____

_____

_____

_____

_____

_____

Sincerely,

_____

Unit 4 Lesson 3 – Family Fun

Querido _____,

Aprendimos mas en la clase de matematicas hoy sobre figuras semejantes y la factor de escala.

Estas son algunas estrategias que necesito para resolver los problemas en el juego de esta unidad.

_____
_____
_____
_____
_____
_____

Atentamente,

_____

This portion of the curriculum is NOT required, but should be used to supplement and enrich the unit's activities.

Enrichment Suggestions

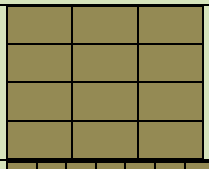
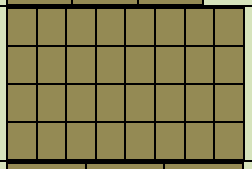
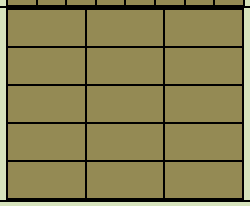
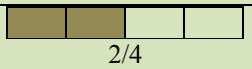
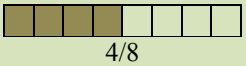
Unit 4 ***Spaghetti and Meatballs for All***

Math Walk
Look around the campus. Is there an area that is set up for a special purpose? Walk the area and see how efficiently it functions for its purpose. Then consider what would happen if that area were arranged differently? How would it change the number of people who could access the area? The traffic flow in and out of the area? The access for people with different needs? What other functions might be altered because of a change? Discuss in small groups. Create a 2-sided poster which illustrates on one side the "as is" area and what its functions are and on the other side the "changes to the area" and how the changes would affect the functionality.

Technology Connection
- Fraction, Decimal, Percent practice, including games: http://www.bbc.co.uk/skillswise/numbers/fractiondecimalpercentage/comparing/comparingall3/index.shtml
- A Few More Games: http://www.quia.com/jg/65724.html

More Curriculum Connection Ideas off the Web
- **Social Studies:** What is the history of spaghetti? When and where did people first start to eat this popular meal? There seems to be a differing opinion. Decide what you think and debate the issue. http://www.online-gourmet-foods.com/history-of-spaghetti.html http://www.bestofsicily.com/mag/art73.htm http://www.inmamaskitchen.com/FOOD_IS_ART/pasta/historypasta.html
- **Science:** Did you know that there is a science to cooking? Check what are the physical changes to dry spaghetti as it is cooked? Investigate using one of these experiments. http://www.gk-12.osu.edu/Lessons/4th%20Grade/Spagetti%20Physical%20Change.pdf http://www.ehow.com/info_7966876_spaghetti-science-activities.html
- **Art: Art, - Pasta Art**
  Modify this activity by having students first look at the various types of pasta available to them, then sketch a picture and finally fill in with the appropriate pasta pieces.
  http://tlc.howstuffworks.com/family/pasta-crafts1.htm

BLM All-School Unit 4, Lesson 3 **Family Fun Game Answer Key**

Problem Letter	Kinder	1-2	3-4	5-6	7-8
A	11 seeds	23	3	$6\frac{1}{4}$ or 6.25	short = 6 long = 8
B	4 seeds	23	9	$\frac{5}{8}$ or 0.625 cups	6
C	4 seeds	39	42	$423,294,920.10	1
D	5 seeds	4	6 seedlings	2134.448	3
E	10 seeds	17	8 bundles	$7400 down	(x3)
F	3 seeds	13	50 bundles	10% water	(x $\frac{1}{3}$)
G	(see special instructions)	14		$48.50 tax	(x $\frac{1}{2}$)
H	(see special instructions)	68		$33 late fee	(x3)
I	2 equal parts	23		$375 earned	(x5)
J	Nickel	Divided into four equal parts	3.21	$39.64	(x3)
K	Dime	Parts are equal	6 x 7 = 42 7 x 6 = 42 42 ÷7 = 6 42 ÷ 6 = 7	$12.20 tip	(x5)
L	Quarter	5	xx xx xx xx xx xx xx xx xx	25% tip	(x5)
M	Penny	4 + 3 = 7	Eleven and seven tenths	no. labels flipped	15
N	Bottom line	12 – 2 = 10	 2/4  4/8	yes. scale factor of (x6)	no – # of shirts varies from each closet
O	Top line	5 wild things	0.7	60 students:1 bus	yes – 2 wheels on each bicycle
P	11	4	Between 0.25 and 0.5	30 notes hit	no – no scale factor
Q	8	4 and 6 are compatible	Line closest to 1	$\frac{17}{12}$ or $1\frac{5}{12}$	yes – scale factor (x20)
R	13 beans 13	8 + 5 = 13 5 + 8 = 13 13 – 8 = 5 13 – 5 = 8	Line in the middle	$4\frac{1}{8}$	yes – scale factor (x10)

Generic Family Fun Game Board

Materials Generic to All Units:

- Game Markers
- Game Cards for your Level
- Answer Key for your Level
- Game Movement Cards (white)
- Unit-specific Materials List

Playing the Game

1. Begin in one of the corner shapes. There may be more than one player in each starting shape. Remember where you started.
2. On your turn, draw one of your level game cards and work the problem.
3. One of the other players uses the Answer Key to check your answer. If correct, draw a movement card and move the given places
   - Forward movement in a clockwise direction.
   - Back movement in a counter clockwise direction.

   If incorrect, do not move.
4. Game is over when the first person runs the entire track, ending back on the starting shape.

Tablero de juego

Materiales genéricos para todas las unidades:

- Fichas para jugar
- Tarjetas del juego para su nivel
- Clave de respuestas para su nivel
- Tarjetas de movimiento del juego (blancas)
- Lista de materiales específicos de la unidad

Cómo se juega

1. Empiece en una de las esquinas. Puede haber más de
1 jugador en cada figura de inicio.
2. Cuando sea su turno, saque una de las tarjetas de
juego de su nivel y resuelva el problema.
3. Uno de los otros jugadores usa la clave de respuestas
para ver si su respuesta es correcta. Si es correcta, saque una tarjeta de movimiento y mueva su ficha como lo indica la tarjeta.
   - Movimiento hacia adelante en el sentido de las manecillas del reloj.
   - Movimiento hacia atrás en el sentido contrario a las manecillas del reloj.

   Si es incorrecta, no se mueve.
4. El juego se acaba cuando la primera persona recorre
toda la pista y termina en la figura de inicio.

Units 4 Lesson 3 – FAMILY FUN

One per student for home
One per partner pair in class

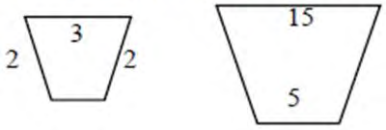
*Print on **goldenrod** paper.*

Family Fun – Problem Cards (1 of 2)

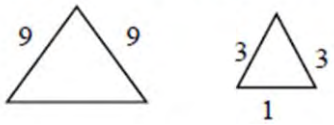
A.
What is the measure of the missing sides?

B.
What is the measure of the missing side?

C.
What is the measure of the missing side?



D.
What is the measure of the missing side?



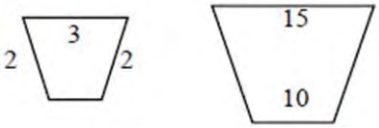
E.
What is the scale factor?

F.
What is the scale factor?

G.
What is the scale factor?

H.
What is the scale factor?

I.
What is the scale factor?



Units 4 Lesson 3 – FAMILY FUN

One per student for home
One per partner pair in class

*Print on **goldenrod** paper.*

Family Fun – Problem Cards (1 of 2)

A.

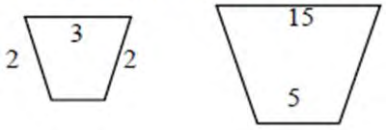
¿Cuál es la medida del lado que falta?

B

¿Cuál es la medida del lado que falta?

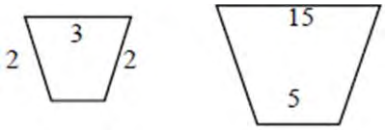
C.

¿Cuál es la medida del lado que falta?



D.

¿Cuál es la medida del lado que falta?



E.

¿Cuál es el factor de escala?

F.

¿Cuál es el factor de escala?

G.

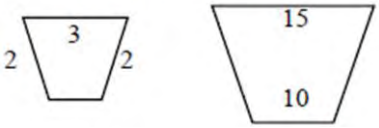
¿Cuál es el factor de escala?

H.

¿Cuál es el factor de escala?

I.

¿Cuál es el factor de escala?



Units 4 Lesson 3 – FAMILY FUN

One per student for home
One per partner pair in class

*Print on **goldenrod** paper.*

Family Fun – Problem Cards (2 of 2)

J.

What is the scale factor?

1	2	3	4	5
3	6	9		

K.

What is the scale factor?

1	2	3	4	5
5	10	15		

L.

What is the fifth term?

1	2	3	4	5
5	10	15		

M.

What is the fifth term?

1	2	3	4	5
3	6	9		

N.

Is this a proportional relationship?

Number of shirts in closets

O.

Is this a proportional relationship?

Number of tires to bicycles

P.

Is this a proportional relationship?
Lap 1, 15 min. Lap 2, 25 min.
Lap 3, 20 min. Lap 4, 30 min

Q.

Is this a proportional relationship?
Lap 1, 20 min. Lap 2, 40 min.
Lap 3, 60 min. Lap 4, 80 min

R.

Is this a proportional relationship?
Lap 1, 10 min. Lap 2, 20 min.
Lap 3, 30 min. Lap 4, 40 min

Units 4 Lesson 3 – FAMILY FUN

One per student for home
One per partner pair in class

*Print on **goldenrod** paper.*

Family Fun – Problem Cards (2 of 2)

J.

¿Cuál es el factor de escala?

1	2	3	4	5
3	6	9		

K.

¿Cuál es el factor de escala?

1	2	3	4	5
5	10	15		

L.

¿Cuál es el quinto término?

1	2	3	4	5
5	10	15		

M.

¿Cuál es el quinto término?

1	2	3	4	5
3	6	9		

N.

¿Es ésta una relación proporcional?

Número de camisas en armarios.

O.

¿Es ésta una relación proporcional?

Número de llantas a bicicletas.

P

¿Es ésta una relación proporcional?

Lap 1, 15 min. Lap 2, 25 min. Lap 3, 20 min. Lap 4, 30 min

Q

¿Es ésta una relación proporcional?

Lap 1, 20 min. Lap 2, 40 min. Lap 3, 60 min. Lap 4, 80 min

R

¿Es ésta una relación proporcional?

Lap 1, 10 min. Lap 2, 20 min. Lap 3, 30 min. Lap 4, 40 min

Special 7th – 8th Game Instructions

Materials:

- Family Fun Generic Game Board
- Family Fun Movement Cards
- Unit 4 Family Fun Problem Cards for grades 7-8 (green)
- Family Fun Answer Key for Unit 4 (all grade bands)
- Unit 4 Family Fun Special 7th – 8th Game Instructions

Solution Expectations

Problems A – I
This card set focuses on scale factor, similar figures, and proportionality. Students should compare corresponding sides of the figures, determine the scale factor, and solve for the missing measurement.

Problems J – R
This card set focuses on scale factor and proportionality without the use of shapes. Solution strategies are essentially the same as Problems A-I. Students should compare ratios, determine if a scale factor is present, and then proceed to answer the question.

Unit 4 Lesson 3 – FAMILY FUN

Instrucciones especiales para 7-8 Grados

Materiales:

- Tablero de juego
- Tarjetas de movimiento
- Tarjetas de problemas (para los grados 7-8)
- Clave de respuestas para Unidad 4 (todos los grados)
- Instrucciones especiales

Expectativas de solución

Problemas A - I
Este juego de cartas se centra en el factor de escala, las figuras similares y la proporcionalidad. Los estudiantes deben comparar los lados correspondientes de las figuras, determinar el factor de escala y resolver la medida faltante.

Problemas J – R
Este juego de cartas se centra el factor de escala y la proporcionalidad sin el uso de las formas. Las estrategias de solución son esencialmente las mismas que las de los Problemas A-I. Los estudiantes deben comparar relaciones, determinar si un factor de escala está presente y, luego, proceder a responder la pregunta.

Math Matters 2014 – In-Home Instruction

Math Objectives

Math Lesson 1

- Compare measurements of squares.
- Work with others to find scale factors for similar squares.

Math Lesson 2

- Compare measurements of rectangles.
- Work with others to find scale factors and similar rectangles.

Differentiate

Math Lesson 1 – students explore similarity of figures through working with squares.

Math Lesson 2 – students use rectangles to find scale factor.

Snack Fraction Notice

All snack fractions are common throughout the grade bands. All grade bands have daily snack fraction activities provided. All snack fractions for a unit in a specific grade band will practice the same set of skills. Therefore, you may choose from any of the three activities.

Materials

Math Lesson 1

- 36 color tiles per student
- customary ruler (inches)

Math Lesson 2

- **BLM** Similar Rectangle Cut-outs
- **BLM** Similar Rectangles Record Sheet
- **BLM** Similar Rectangles Record Sheet-Teacher Guide
- scissors
- customary ruler (inches)

Family Fun

- Family Fun Generic Game Board
- Family Fun Movement cards
- Unit 4 Family Fun-Problem Cards
- Family Fun Answer Key from Unit 1 (all grade bands)
- Unit 4 Family Fun Special 7^{th} – 8^{th} Game Instructions
- game markers

Snack Fractions (Math Lesson 1)

- 2 skewers
- 1-in cubes cooked meat (16)
- 8 cubes pineapple
- 8 cheese cubes
- 8 cherry tomatoes
- 2 paper dessert plates
- 2 paper towels

All items listed above per partner pair

- **BLM** Kabob-Snack Fractions

QUESTIONING
As a result of this lesson, your students should be able to respond to the following:

- How do you know these two rectangles are similar?
- What is the SCALE FACTOR used to determine the dimensions of the larger rectangle?
- Suppose you had started with the larger rectangle – what scale factor would you have used to create the smaller rectangle?
- You have not included these two rectangles as a similar pair. How do you know they are NOT similar
- Explain your strategy for solving the problem.
- What is the SCALE FACTOR used to determine the new dimensions?
- What is this question asking you to do?

Math Vocabulary
scale factor, similarity, proportions, similar, ratio

CGI Problem

- Price, measurement
- Price, partitive

Journal Writing
Explain how you know whether you are reducing or enlarging a figure by looking at the scale factor.

Family Fun
A generic game board is being used in all grade levels, differentiated by game cards specific to the grade level. Students use problem cards with discount and tip word problems.

Snack Fractions
Students divide their snack in half and calculate various percentages based on their portion.

Assessment
Students will be introduced to and practice skills for items 1, 2, 3, 4, 5, 6, 7, 8, 9.

Grades 7-8 Overview

Unit 5, Lesson 1 Aeroscraft Article "Frankenstein of the Skies"

This is a quick snapshot of each of the three math lessons for this unit. For detailed instructions, balanced literacy objectives and enrichment ideas, refer to the complete lesson plans for each lesson.

Lesson Segment	Math Objectives	Language Objectives	Activity	Manipulatives	Supplies
Unit 5 Lesson 1 Daily Routine 30 – 45 minutes	Solve word problems using a variety of strategies and defend their strategies. Model and solve 3-step word problems. Compose and decompose values to show a new representation of the value. Find equivalent fractions.	Speak to partners, teacher, and class using vocabulary. Discuss problem solving process and strategies. Explain how they decided to rename the target number.	**Essential:** • Measurement Lab • Solve It! Problems • Fraction Action • *X* Marks the Spot • CGI **Optional:** • Target Number 10 • Graphing • Money Matters	• trundle wheel • primary timers • distance markers	• **BLM** Aeroscraft Investigation (1of3)-Measurement Lab Record Sheet • **BLM** Solve It! Problems 1-2 • **BLM** Fraction Action and *X* Marks the Spot • **BLM** Lessons 1-3 CGI *Aerospace Articles*
Classroom *Lesson 1* 30 min. – 1 hour	Use ratios to determine rates of travel.	Compare and contrast information in a science featured article. Explain vocabulary words to the class using definitions, sentences, examples, and pictures. Discuss problem solving strategies.	**Vocabulary** Find what is common to a group of pictures. **Literature** Speculate on a mystery picture, and then read article #1, "Frankenstein of the Skies." **Transition to Math** Students use ratios to find rate of speed.		• **BLM** Mystery Picture • **BLM** Vocabulary Pictures for each word • **BLM** Comparison Chart • Article "Frankenstein of the Skies"

Math ***Lesson 1*** 30 minutes	Use ratios to determine rates of travel, distances traveled, and time traveled.	Discuss problem solving strategies with peers. Write out solutions for solving problems. Discuss how to set up ratios to show proportional relationships. Explain how to set up a ratio.	**Vocabulary** Use vocabulary pervasively in the lesson, including literature vocabulary (see suggestions in side bar of lesson). **Mathematics** Revisit setting up ratios and solving for *x*.		• **BLM** Aero-Travel
Follow-up ***Lesson 1*** 30 min. – 1 hour *(including Snack Fractions)*	Use ratios to determine rates of travel, distances traveled, and time traveled.	Discuss problem solving strategies with peers. Write out solutions for solving the model problem. Explain how to set up a proportional ratio. Write an explanation of how ratios help you think about relationships.	Students solve ratio problems involving their own towns. **Writing Prompt** How do ratios help you think about relationships?		• **BLM** Your Aero-Travel Trip • **BLM** Recursive Review Problems (found in Lesson 1)
Snack Fractions ***Lesson 1***	Use addition, subtraction, multiplication and division to solve problems involving fractions and decimals. Convert between fractions, decimals, whole numbers and percents. Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios). Estimate and find solutions to application problems involving percent.	Discuss how ratios and proportions can be used to solve real-world problems.	Students will work in pairs and explore fraction, decimal, and percent concepts through fair-sharing Laughing Cow Cheese wedges.	• 3 Laughing Cow Cheese wedges • 1 plastic knives • 2 paper dessert plates • 2 paper towels *All items listed above per partner pair*	• **BLM** Laughing Cow Cheese-Snack Fractions

Grades 7-8 Overview

Unit 5, Lesson 2 Aeroscraft Article "The Flying Luxury Hotel"

This is a quick snapshot of each of the three math lessons for this unit. For detailed instructions, balanced literacy objectives and enrichment ideas, refer to the complete lesson plans for each lesson.

Lesson Segment	Math Objectives	Language Objectives	Activity	Manipulatives	Supplies
Unit 5 Lesson 2 Daily Routine 30 – 45 minutes	Solve word problems using a variety of strategies and defend their strategies. Model and solve 3-step word problems. Compose and decompose values to show a new representation of the value. Find equivalent fractions.	Speak to partners, teacher, and class using vocabulary. Discuss problem solving process and strategies. Explain how they decided to rename the target number.	**Essential:** • Measurement Lab • Solve It! Problems • Fraction Action • *X* Marks the Spot • CGI **Optional:** • Target Number 30 • Graphing • Money Matters	• trundle wheel • primary timers • distance markers	• **BLM** Aeroscraft Investigation (2of3)-Measurement Lab Record Sheet • **BLM** Solve It! Problems 3-4 • **BLM** Fraction Action and *X* Marks the Spot • **BLM** Lessons 1-3 CGI *Aerospace Articles*
Classroom *Lesson 2* 30 min. – 1 hour	Use ratios to determine rates of travel.	Compare and contrast information from a second science feature article. Explain vocabulary words to the class using definitions, sentences, examples, and pictures. Discuss problem solving strategies.	**Vocabulary** Practice vocabulary through a game called "You're the Teacher." **Literature** Read article #2 "The Flying Luxury Hotel" and build a Comparison chart based on the information. **Transition to Math** Discuss Follow-up activity from Lesson 1.		• **BLM** Vocabulary Pictures for each word • **BLM** Comparison Chart • Article "The Flying Luxury Hotel"

Math ***Lesson 2*** 30 minutes	Use any strategy to solve percent problems including percent discounts, interest and tips.	Discuss problem solving strategies with peers. Write out solutions for solving problems. Discuss how to set up percent discount problems. Explain how to solve tip and interest problems.	**Vocabulary** Use vocabulary pervasively in the lesson, including literature vocabulary (see suggestions in side bar of lesson). **Mathematics** Revisit solving discount, interest and tip percent problems.		• paper and pencil
Follow-up ***Lesson 2*** 30 min. – 1 hour *(including Snack Fractions)*	Use any strategy to solve percent problems including percent discounts, interest and tips.	Discuss problem solving strategies with peers. Write out solutions for solving problems. Discuss how to set up percent discount problems. Explain how to solve tip and interest problems. Write out an explanation of how to find the amount of money earned for a certain percent of interest.	Continue the lesson, modeling another problem before circulating the room to assure students understand the problems and how to set up ratios. **Writing Prompt** Explain how to find the amount of money earned for a certain percent of interest.		• **BLM** Luxury Hotel in the Sky • **BLM** Recursive Review Problems (found in Lesson 1)
Snack Fractions ***Lesson 2***	Use addition, subtraction, multiplication and division to solve problems involving fractions and decimals. Convert between fractions, decimals, whole numbers and percents. Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios). Estimate and find solutions to application problems involving percent.	Discuss how ratios and proportions can be used to solve real-world problems.	Students will work in pairs and explore fraction, decimal, and percent concepts through fair-sharing Crackers and Nutella.	• 2 paper dessert plates • 2 paper towels • 1 plastic knife • 4 graham crackers • 2T Nutella *All items above per partner pair*	• **BLM** Crackers and Nutella-Snack Fractions

Grades 7-8 Overview

Unit 5, Lesson 3 Aeroscraft Article "How the Aeroscraft Works"

This is a quick snapshot of each of the three math lessons for this unit. For detailed instructions, balanced literacy objectives and enrichment ideas, refer to the complete lesson plans for each lesson.

Lesson Segment	Math Objectives	Language Objectives	Activity	Manipulatives	Supplies
Unit 5, Lesson 3 Daily Routine 30 – 45 minutes	Solve word problems using a variety of strategies and defend their strategies. Model and solve 3-step word problems. Compose and decompose values to show a new representation of the value. Find equivalent fractions.	Speak to partners, teacher, and class using vocabulary. Discuss problem solving process and strategies. Explain how they decided to rename the target number.	**Essential:** • Measurement Lab • Solve It! Problems • Fraction Action • *X* Marks the Spot • CGI **Optional:** • Target Number 60 • Graphing • Money Matters	• trundle wheel • primary timers • distance markers	• **BLM** Aeroscraft Investigation (3of3)-Measurement Lab Record Sheet • **BLM** Solve It! Problem 5 • **BLM** Fraction Action and *X* Marks the Spot • **BLM** Lessons 1-3 CGI *Aerospace Articles*
Classroom *Lesson 3* 30 min. – 1 hour	Compare problem solving strategies with peers.	Summarize learning about the Aeroscraft. Paraphrase key details from a science feature article. Review vocabulary words from the summer by playing a game. Discuss how the Aeroscraft will work. Discuss problem solving strategies. Explain problem solving strategies to peers.	**Vocabulary** Play Vocabulary Bingo **Literature** Read article "How the Aeroscraft Works" and discuss different topics based on the information. **Transition to Math** Discuss Follow-up activity from Lesson 2.		• Vocabulary BINGO instructions • Vocabulary BINGO card • Activity 9 on website: http://www.teachnet.com/lesson/langarts/wordwall062599.html • Article "How the Aeroscraft Works"

Math ***Lesson 3*** 30 minutes	Solve similarity problems using scale factors and proportional ratios. Draw models to represent similar objects.	Discuss problem solving strategies with peers. Write out solutions for solving problems. Discuss how to set up ratios to find scale factors. Explain what a scale factor means.	**Vocabulary** Use vocabulary pervasively in the lesson, including literature vocabulary (see suggestions in side bar of lesson). **Mathematics** Sketch a scale picture and find the scale factor using proportions and estimation.	• 4-function calculator	• Article "How the Aeroscraft Works" • **BLM** Aeroscraft Scale Model
Follow-up ***Lesson 3*** 30 min. – 1 hour *(including Snack Fractions)*	Solve similarity problems using scale factors and proportional ratios. Draw models to represent similar objects.	Discuss problem solving strategies with peers. Write out solutions for solving problems. Discuss how to set up ratios to find scale factors. Explain what a scale factor means. Write an explanation of how proportions can help you find scale factors.	Continue the lesson, modeling another problem before circulating the room to assure students understand the problems and how to set up ratios. **Writing Prompt** How can proportions help you find scale factor?	• dominoes (1 set per pair)	• **BLM** King of the Mountain-Game Instructions • King of the Mountain Game Board • game markers • graph paper • scratch paper
Snack Fractions ***Lesson 3***	Use addition, subtraction, multiplication and division to solve problems involving fractions and decimals. Convert between fractions, decimals, whole numbers and percents. Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios). Estimate and find solutions to application problems involving percent.	Discuss how ratios and proportions can be used to solve real-world problems	Students will work in pairs and explore fraction, decimal, and percent concepts through fair-sharing Bagels and Cream Cheese.	• 1 large bagel • 4T cream cheese • 2 paper dessert plates • 2 paper towels • 2 plastic knives *All items above per partner pair*	• **BLM** Bagels and Cream Cheese-Snack Fractions

Project SMART/Math MATTERS 2014

Grade Level: 7-8	Unit 5 / Lessons 1 – 2 – 3

Daily Routine Math Objectives:
Observe and use patterns based on the online activity to solve problems.
Model and solve situational problems with fractions, decimals and percents using pictures, numbers and words.
Use scale factors to find the dimensions of similar rectangles.
Measure and record walking distances.
Measure out lengths corresponding to aircrafts.
Calculate ratios according to measured lengths.
Use measurements to calculate rates of speed.
Calculate percent differences in aircrafts, according to measured lengths.
Solve multi-step word problems.
Find missing addends.

Daily Routine Language Objectives:
Listen, read, speak, and write the problem.
Listen to, read, speak and write about measurement vocabulary.
Speak to partners, teacher, and class using vocabulary introduced in the Daily Routines.

Unit Math Objectives:
Use ratios to determine rates of travel, distances traveled, and time traveled.
Use any strategy to solve percent problems, including percent discounts, interest and tips.
Compare problem solving strategies with peers.
Solve similarity problems using scale factors and proportional ratios.
Draw models to represent similar objects.

Unit Language Objectives:
Discuss specific objects and their relationships.
Discuss and list strategies for learning new vocabulary words.
Read and speak sentences containing vocabulary words.
Read, write and speak self-created sentences containing vocabulary words.
Discuss a mystery object and how it might be used and what it might be like.
Discuss problem solving strategies with peers.
Listen to, read and discuss "Frankenstein of the Skies," "The Flying Luxury Hotel of Tomorrow," and "How the Aeroscraft Will Work."
Write out solutions for solving problems.
Discuss how to set up ratios to show proportional relationships and to find scale factors.
Explain how to set up ratios.
Write an explanation of how ratios help you think about relationships.
Discuss the Aeroscraft and how it will work.
Discuss how to set up percent discount problems.
Explain how to solve tip and interest problems.
Write out an explanation of how to find the amount of money earned for a certain percent of interest.
Explain what a scale factor means.
Write an explanation of how proportions can help you find scale factors.

Technology Objectives:
Use research skills and electronic communication, with appropriate supervision, to create new knowledge.

Vocabulary
Math: scale factor, similarity, similar, proportion, percent, ratio, interest, tax
Language: inhabit, vehicle, conventional, luxury, environment, configured, amenities, vertical

Resources/Literacy Links
(Articles about the Aeroscraft)
Frankenstein of the Skies http://abcnews.go.com/Technology/story?id=1644771&page=1
How the Aeroscraft Works http://abcnews.go.com/Technology/story?id=1644771&page=1
The Flying Luxury Hotel of Tomorrow
http://www.popsci.com/popsci/whatsnew/18ac893302839010vgnvcm1000004eecbccdrcrd.html

Lesson Sequence

- Daily Routine: 30 – 45 minutes
- Classroom Lesson: 30 minutes - 1 hour
- Math Lesson: 30 minutes
- Classroom Follow-up including Independent Writing: 30 minutes - 1 hour

Enrichment Activities – These are BEYOND EXPECTATION

Math Extensions:
Fraction/Decimal/Percent Games:
http://www.bbc.co.uk/skillswise/numbers/fractiondecimalpercentage/comparing/comparingall3/index.shtml
http://www.quia.com/jg/65724.html
Multiplication Puzzler (Early Egyptian Multiplication):
http://freakonomics.blogs.nytimes.com/2007/09/05/a-little-math-puzzle-to-ponder/

Strand Extensions:
Social Studies: Read articles on the Aeroscraft to determine jobs and interaction on the ship.
Science: Unit on buoyancy developed by Berkeley University for middle school students regarding the Aeroscraft**.**
http://www.coe.berkeley.edu/cues/pep/adept/Particle_Party_Balloons_all.pdf
Art: Design a new form of ground transportation
Writing Workshop: Plan a route from LA to NYC that would be an interesting "tour" trip of natural and man-made sites to see from the low and slow flying Aeroscraft.

Technology:

Materials
- **BLM** Aeroscraft Investigation (1of 3)-Measurement Lab Record Sheet
- **BLM** Solve It! Problems 1-2
- **BLM** Fraction Action and *X* Marks the Spot
- **BLM** Lessons 1-3 CGI *Aerospace Articles*

Math Objectives
- Solve word problems using a variety of strategies and defend their strategies.
- Model and solve 2-step word problems.
- Compose and decompose values to show a new representation of the value.
- Find equivalent fractions.

Language Objectives
- Speak to partners, teacher, and class using vocabulary.
- Discuss problem solving process and strategies.
- Explain how they decided to rename the target number.

Math Vocabulary
scale factor
similarity
similar
proportion
percent
ratio
interest
tax

Literature Vocabulary
inhabit
vehicle
conventional
luxury
environment
configured
amenities
vertical

Unit 5, Lesson 1 Grades 7-8

Daily Routine

The following daily activities will help prepare your students for the Post-assessment. They are not optional.

ESSENTIAL

Measurement Lab
- **Lesson 1 – Aeroscraft Investigation (1 of 3)**
- Lesson 2 – Aeroscraft Investigation (2 of 3)
- Lesson 3 – Aeroscraft Investigation (3 of 3)

Lesson 1 Materials
- trundle wheel
- primary timers
- distance markers

Lesson 1 Student Groups
1) Using the trundle wheel outside, measure a distance that would be equal to the length of 2 football fields plus end zones. *(about 720 ft. or 240 yds.)*
2) Mark and label it as Distance #1. *(Must last for entire unit.)*
3) Group members will time each other walking Distance #1 from start to finish.
4) Calculate rate of speed for each student.

Solve It! Multi-step problem solving
- **Lesson 1 – pairs, related 3-step problems**
- Lesson 2 – pairs, 3-step problem
- Lesson 3 – pairs, 3-step problem

Fraction Action
- **Lesson 1 – BLM Fraction Action and X Marks the Spot**
- Lesson 2 – BLM Fraction Action and X Marks the Spot
- Lesson 3 – BLM Fraction Action and X Marks the Spot

***X* Marks the Spot**
- **Lesson 1 – BLM Fraction Action and X Marks the Spot**
- Lesson 2 – BLM Fraction Action and X Marks the Spot
- Lesson 3 – BLM Fraction Action and X Marks the Spot

CGI
- **Lesson 1 – rate, measurement division**
- Lesson 2 – rate, multiplication (assessment item 7)
- Lesson 3 – price, partitive (assessment item 6)

Assessment Items Students are introduced to and practice the skills necessary for success on the following assessment items: 1, 2, 6, 7, 8, 9 **TEKS for this Unit** 7th - 7.1A, 7.ABD, 7.3AB 8th - 8.1AB, 8.2AB, 8.3	**Unit 5, Lesson 1** **Grades 7-8** **Daily Routine** - continued --- **The following activities, although certainly developmentally appropriate for your 7th and 8th grade students, do not specifically address objectives assessed on the Post-assessment. Schools with shorter teaching spans can consider omitting some or all these activities as your time permits.** --- **OPTIONAL** **Target Number** • **Lesson 1 – Target Number 10** • Lesson 2 – Target Number 30 • Lesson 3 – Target Number 60 **Money Matters** (*If you have a full program and wish to use this optional activity, you will find BLMs and Explanations in the Optional Activities Tab of your Teacher's Guide*.)

Unit 5 Lesson 1 – Daily Routines - Measurement Lab

One per student

Aeroscraft Investigation (1 of 3) – Measurement Lab Record Sheet

Students should work in small groups.

Materials:

- trundle wheel
- primary timers
- distance markers

Task:

1) Using the trundle wheel outside, measure a distance that would be equal to the length of 2 football fields plus end zones (about 720 ft. or 240 yds.).

2) Mark and label it as Distance #1. (Marker must last for entire unit.)

3) Time each other FAST-walking Distance #1 from start to finish.

   partner #1 _____

   partner #2 _____

   partner #3 _____

4) Calculate the rate of speed for each student (yards per minute).

   partner #1 _____ yards per minute

   partner #2 _____ yards per minute

   partner #3 _____ yards per minute

5) BONUS – Using the information you found in this activity, calculate the approximate rate of speed in (miles per hour) for each member of the group.

Unit 5 Lesson 1 – Daily Routines - Solve It! Problems (Pairs)

One per student

Partner #1 - Problem 1:

Blia and Nu decided to open a dog walking business after school. In deciding how to charge, they thought about how much time they could invest after homework and chores. Each felt they could handle two 25-minute walks five times a week. They looked up dog walking and found that the National average charge is $16 a walk. They wanted to put 10% of what they earned in a savings account to use for business costs. Based on the number of walks they do, how much money will the girls get to take home at the end of the week after their deductions for business costs and savings?

Problem Solution Name:	**Solution Verification** Name:

Unit 5 Lesson 1 – Daily Routines - Solve It! Problems (Pairs)

One per student

Partner #2 - Problem 2:

Blia and Nu realized, after the first day of running their dog walking business, that more supplies would be needed to ensure the animals were in a safe and clean environment. Each had two walks that day that earned them $32 apiece. Blia even earned a tip of $5. At the pet store they found a sturdy leash for $12.95, and another that was regularly priced $21.95 on sale for 25% off. They needed plastic bags to clean up after the dogs. They each bought a dispenser with 30 refill bags for $6.05. The girls thought it would be easier to combine their earnings for the day, pay for the new supplies, and then split the remaining balance between them equally. What was their profit at the end of the day?

Problem Solution Name:	**Solution Verification** Name:

Unit 5 Lesson 1 – Daily Routines – Fraction Action and *X* Marks the Spot

One per student

Fraction Action

Materials:
None for this activity

Task:
Emilio bought a picture frame that measured 8" x 12". He bought a similar frame, but smaller by one-third of those dimensions. What are the measurements of the new frame?

X Marks the Spot

Write and equation and solve for x.

A rectangle has a perimeter of 36 inches. The length is twice the width. What is the width (x) of the rectangle?

Unit 5 Lesson 1-3 – Daily Routines - CGI Problems

One per student

CGI – Aeroscraft Articles

	Multiplication	Measurement Division	Partitive Division
Grouping/ Partitioning	The chef spent $36 per serving for a luxurious meal on the Aeroscraft's first trip. If he prepared for 250 people, what did he spend on the food?	The chef spent a total of $6,750 for one luxurious meal. If he spent $27 per serving, how many servings did he purchase?	The chef spent a total of $9750 for 250 servings for one luxurious meal on the Aeroscraft. How much did each serving cost?
Rate	At a cruising speed of 174 mph, how far will the Aeroscraft be able to cruise in 12 hours?	The Aeroscraft will be able to cruise at a speed of 174 mph. At that rate, how long will it take the ship to cruise 1044 miles?	If the Aeroscraft traveled 1176 miles in 7 hours, what would the average mile per hour rate of speed be?
Price	Visiting the Spa might be one of the luxurious amenities on the Aeroscraft. If one visit costs $125, what would 4 visits cost?	A trip to the Spa, one of the luxurious amenities on the Aeroscraft, costs $135. If the total income for a trip of 18 hours was $3510, how many spa visits were made during that time period?	The Spa is an optional amenity onboard the Aeroscraft. If in 18 hours $3125 was collected for 25 visits, what is the cost of each visit?

Unit 5 CGI Problems for "Articles on Aeroscraft" 

	Multiplicación	**Medición División**	**División Partitiva**
Agrupamiento/ Partición	El chef gastó $36 por platillo para una comida lujosa en el primer viaje del Aeroscraft. Si preparó para 250 personas, ¿Cuánto gastó en comida?	El chef gastó un total de $6,750 para una comida lujosa. Si gastó $27 por plato, ¿Cuántos platillos compró?	El chef gastó un total de $9750 por 250 platillos de una comida lujosa en el Aeroscraft. ¿Cuánto costó cada platillo?
Velocidad/ritmo	A una velocidad de crucero de 174 mph, ¿Cuánta distancia podrá recorrer el Aeroscraft en 12 horas?	El Aeroscraft podrá llegar a una velocidad de 174 mph. A ese ritmo, ¿Cuánto le tomará a la nave recorrer 1044 millas?	Si el Aeroscraft viajó 1176 millas en 7 horas, ¿Cuál sería el ritmo promedio de velocidad en millas por hora?
Precio	Visitar el Spa puede ser una de las lujosas amenidades del Aeroscraft. Si una visita cuesta $125, ¿Cuánto costarían 4 visitas?	Un viaje al Spa, una de las amenidades de lujo del Aeroscraft, cuesta $135. Si el ingreso total para un viaje de 18 horas fue de $3510, ¿Cuántas visitas al Spa se hicieron durante ese periodo de tiempo?	El Spa es una amenidad opcional a bordo del Aeroscraft. Si en 18 horas se recolectaron $3125 por 25 visitas, ¿Cuál es el costo de cada visita?

Materials

- **BLM** Mystery Picture
- **BLM** Vocabulary Pictures for each word
- **BLM** Comparison Chart
- **BLM** Pictures of things that fly
- Sticky notes
- CLASSROOM set of article for the lesson.

Literature Selection

Article – "Frankenstein of the Skies" http://abcnews.go.com/Technology/story?id=1644771&page=1

Please note: This article is not included in the handouts. You must download and print a copy for classroom use. (Lessons 1 and 2)

Lessons 2: "The Flying Luxury Hotel of Tomorrow" http://www.cnn.com/2006/TECH/02/16/aeroscraft/

Please note: This article is not included in the handouts. You must download and print a copy for classroom use.

Ship was officially launched http://www.gizmag.com/go/8132/

Lesson 3:

http://science.howstuffworks.com/transport/flight/future/aeroscraft.htm

Note: This article must be downloaded from the Internet.

Math Vocabulary

scale factor
similarity
similar
proportion
percent
ratio

Unit 5, Lesson 1 — Grades 7-8

Classroom Lesson

Every day teachers must post the objectives on the board, read them to the students, and have students read them together with the teacher. At the end of the lesson, teacher and students should review to see if they have accomplished both math and language objectives.

Math Objectives:

- Use ratios to determine rates of travel.

Reading Objective:

- Compare and contrast information in a science feature article.

Language Objectives:

- Discuss the relationship between objects, including a mystery object.
- Understand the meaning of vocabulary words and how they are used in a science feature article.
- Discuss problem solving strategies.

BEFORE READING

Building Background – Literature & Vocabulary

Explain: I'm going to show you some pictures. For each one, tell me what it is. Once you've seen all of them, tell me what relationship you see among the pictures. What do they have in common?

1. Show students each picture in the following order:
   - *butterfly*
   - *bird*
   - *airplane*
   - *helicopter*
   - *blimp*
2. Have students identify each word and put each picture up on the board.

3. Have students share what they have in common. Show the following sentence stem, and help students fill it in with their association:
   - **These are all things that _____**

   Note: You are looking for the word "fly." Later you can change it to the vocabulary word "inhabit."

4. Tell students you want to show them another thing that flies. Show students the **BLM Mystery Picture.** Ask, "What do you think this is?" *Students can first talk with their partners, then with the class.*

environment
configured
amenities
vertical

Technology Option
If time permits, you may want to show students the source of "mystery picture:" http://abcnews.go.com/Technology/story?id=1644771&page=1

ELPS *(English Language Proficiency Standards):*
2D, 2E, 2I, 3D, 3F, 4G, 4J, 5B

Unit 2 Connection:
Remind students that they read a Feature Article in Unit 2 about "Living it up in Space." Have them recall what they know about the Feature Article genre. You can also draw upon what students learned as they wrote their own Feature Articles in the Unit 2 Writing Workshop.

Classroom Lesson - continued

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5. Explain: For the past few years a group of scientists have been creating what you see in this picture – they're calling it an "**Aeroscraft**." *Write this for students to see.* It would be a **new** way to fly through the sky. The Aeroscraft is not ready to be used just yet, but soon you might be seeing it up in the air.

   Explain: Today we're going to read a feature article from the ABC News website to learn what the Aeroscraft is. The title of the article is "Frankenstein of the Skies." (*Show students the title so they can all see it.)*

6. Ask, "What does the title tell you about the Aeroscraft?" *Have students share their ideas first with a partner, and then with the whole class.*

7. Have students talk about the Aeroscraft, using the following questions as a guide:
   - Would you like to travel in something like this? What would it be like?
   - What would you see?
   - What would you do on board?
   - Where would you travel?

Comprehensible Input - Vocabulary

Explain: Before we read this feature article about the Aeroscraft – the "Frankenstein of the Skies" – I want to help you understand some of the vocabulary that's in the article.

Practice and Application - Vocabulary

<u>For each word:</u>

1. Show students the **BLM** Vocabulary Pictures for the word, and read the accompanying sentence together.
2. Use the below suggestions to help explain the meaning of the word to students.
3. Then, use the below suggestions to **explain how the word connects to the feature article "The Frankenstein of the Skies."** This meaningful context is essential for students to understand how the word relates to what they will be reading.

Inhabit – *(to live in, but also to occupy)*

- <u>Explanation</u>: For each picture, tell students something living and something inanimate that could inhabit it *(Example: People inhabit tall buildings. Furniture inhabits tall buildings.)*.
- <u>Connection to the Article</u>: In this article you will learn *how* the Aeroscraft could **inhabit** the skies, just like airplanes, birds, butterflies, and helicopters.

Vehicle – *(means of transportation, usually motorized)*
- Connection to the Article: The Aeroscraft will be a new type of **vehicle** that people can use to go from one place to another.

Conventional – *(the usual, or expected)*
- Explanation: For each picture begin the sentence, "This is the conventional way that we . . ." until you get to the last picture of the boy soaring through the air on his bicycle. Then say, "Oops, this is NOT conventional."
- Connection to the Article: The Aeroscraft is not a **conventional** airplane – you will learn how it's different.

Luxury – *(lavish comfort, extravagance)*
- Connection to the Article: The article says that the Aeroscraft is designed for the "**luxury** traveler." What do you think that means?

Environment – *(surroundings)*
- Connection to the Article: The article says that in the Aeroscraft you can work in a "normal **environment**." What do you think that means?

Configured – *(planned arrangement of things)*
- Connection to the Article: The Aeroscraft can be **configured** like a cruise ship. How is the space used on a cruise ship?

Amenities – *(services)*
- Connection to the Article: As we read, listen for what **amenities** the Aeroscraft could have.

Vertical – *(straight up and down, perpendicular)*
- Connection to the Article: The Aeroscraft would have a **vertical** takeoff and landing – just like a helicopter!

DURING READING

Comprehensible Input –Literature: Article #1

Give each student a copy of the article, so they can follow along with the text as you read. This visual support will be helpful for students, since this feature article is complex. Leave the mystery picture as the focal point as you read aloud the article.

Throughout the Reading: Comparing and Contrasting

The reading strategy you will be modeling and practicing with students during this reading is Comparing and Contrasting to help them understand how the Aeroscraft is similar to and different from a conventional airplane.

Guided Reading Groups and Independent Reading Connection

If you conduct guided reading groups as part of your balanced literacy instruction, or provide time for independent reading, you can reinforce these same reading strategies.

After students have read the text on their own, to improve their comprehension of the more difficult parts:
- Comparing and Contrasting:

Informational Text
- What did you learn in this part?
- How is it similar to/different from _____?

Narrative Text
- How are these characters similar? Different?
- How is the setting similar to/different from _____?
- How is the problem similar to/different from _____?
- Does this remind you of something similar in another text?

Classroom Lesson - continued

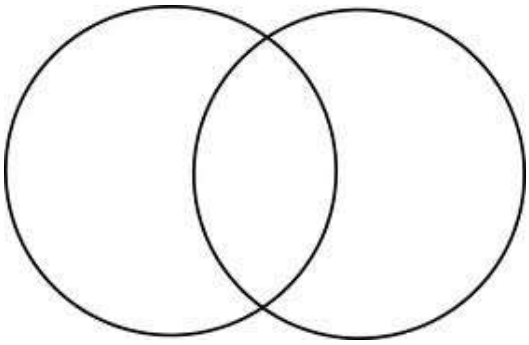
As you read, pause after different paragraphs to either model with a think aloud, or ask students a question:

- Example Teacher Think Aloud: So in this part it's saying that the Aeroscraft _____. That's (similar to/different from) a conventional airplane, which _____.

- Example Teacher Questions:
  - What did we learn in this part about the Aeroscraft vehicle?
    - How is that different from a conventional airplane?
    - How is that similar to a conventional airplane?

As students compare and contrast, add the key details to a Venn Diagram:

Aeroscraft Conventional Airplane



Listening Center: Independent Reading

Have students listen to "The Frankenstein of the Skies" in a Listening Center as part of their independent reading time.

Beginning ELLs: Benefit from listening to a text repeatedly to connect oral and written language.

Intermediate & Advanced ELLs: Benefit from listening to a text repeatedly to develop fluency, and reading along softly when possible.

AFTER READING

Practice and Application – Literature & Vocabulary

T-Chart

1. Give each student a copy of the **BLM Chart.**

2. Have students work with a partner to discuss each part of the chart, and fill in the details from the article. They should refer to their copies of the article to look for the details they want to include in each part of the Chart.

3. Circulate as students are working, and help them refer to the article.

ELLs: You can use this time to meet with a small group of ELLs to help them pull out the key details from the text.

4. Regroup the class. For each part of the Chart, have students share what they wrote. Use students' ideas to write the key details on your enlarged version of the Chart (see following example). When necessary, help students refer to specific parts of the article to find important details that they didn't mention.

Example of Completed Chart, based on "The Frankenstein of the Skies":

	Configured as a Cruise Ship	**Configured as a Cargo/Military Ship**
Purpose	- A way to travel in luxury, and enjoy the trip. - A way to see beautiful views of the land below.	- An easy way to transport troops AND their equipment so everything arrives together at the same time.
Amenities	- Restaurants - Nightclubs - Spas - Casinos - Sleep cabins	- A large, open space to hold 500 tons of cargo (troops and equipment)

Transition to Math

The article tells us that the trip from Los Angeles to New York City will take approximately 18 hours. If the distance between the two cities is 2,451 miles, how fast does the Aerospace intend to cruise? Use ratio to find the answer. Give students a copy of the **BLM** Aero-Travel Problem provided.

Objectives

Review both language and math objectives, making sure students understand how they accomplished each.

inhabit

Animals and other things can **inhabit** these places

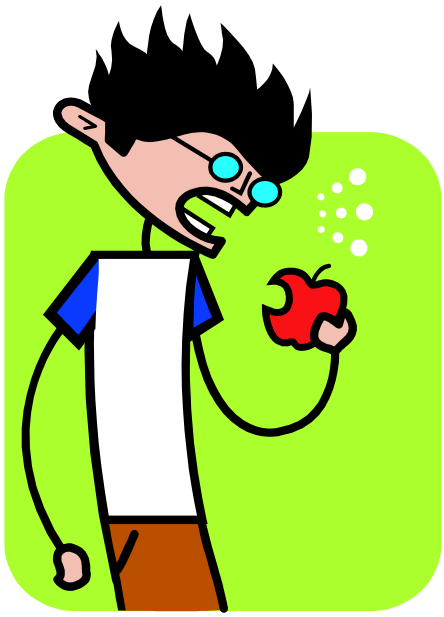
*Los animales y otras cosas pueden **habitar** estos lugares.*

vehicle

It is easier to see far-away places when you travel in a **vehicle**.
Es más facil ver lugares lejanos cuando viajas en un vehículo.

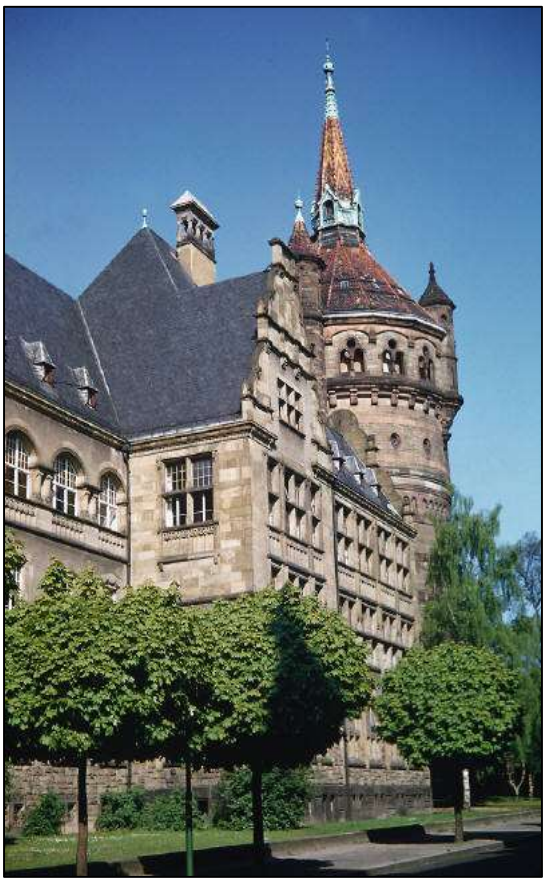
conventional

These are all **conventional** ways of doing things.
Estas son formas convencionales de hacer las cosas.



luxury

All of these show a level of **luxury**.
Todas estas fotografías muestan un nivel de lujo.



environment

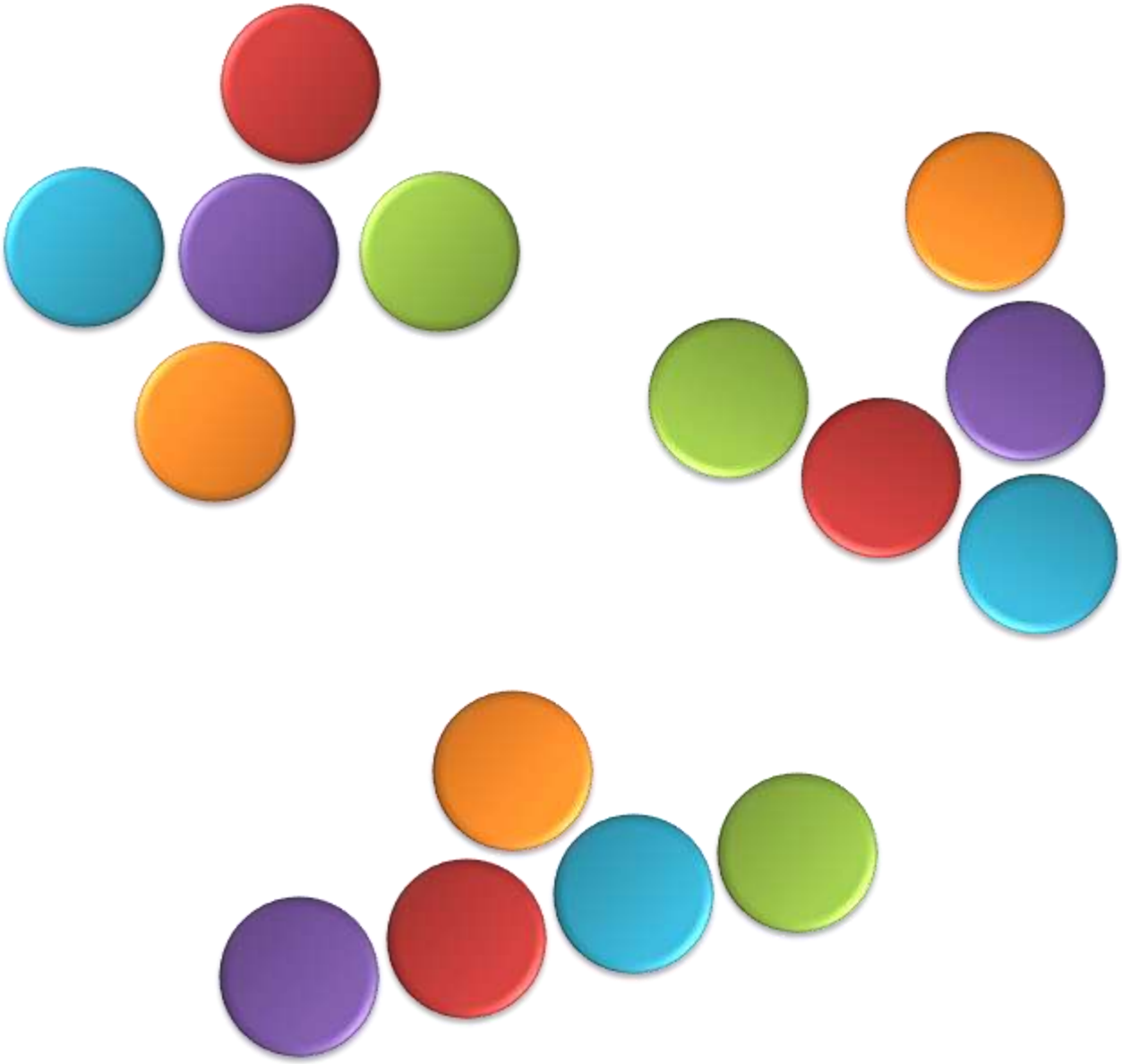
In which **environment** do you live?

¿En qué ambiente vives?

configured

Each of the groups has the same content, but they are **configured** differently.

*Cada una de las formas tiene la misma área, pero está **configurada** de manera diferente.*

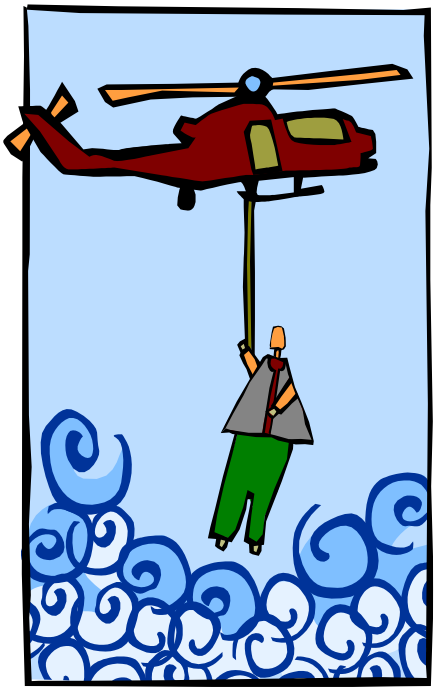


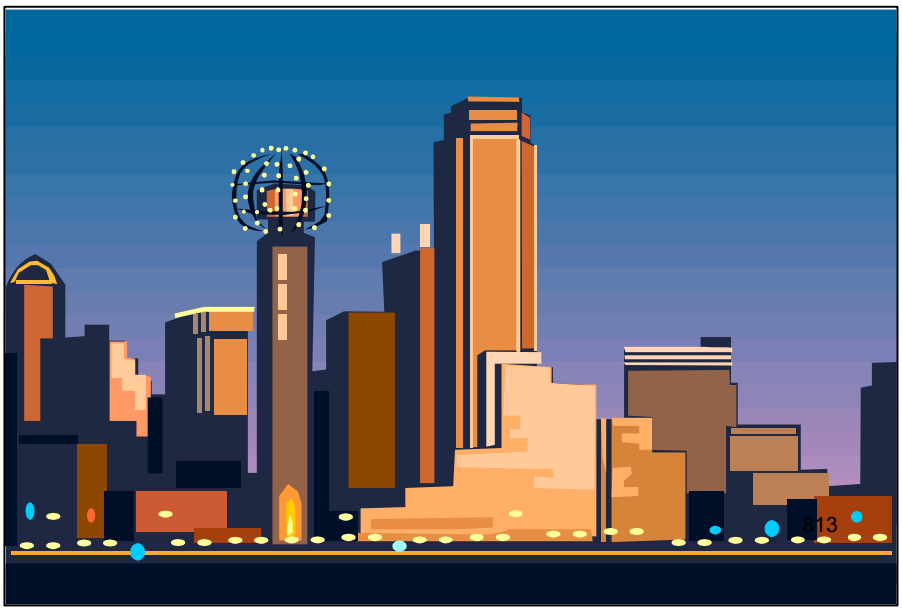
amenities

The resort offered many **amenities** to its guests.
El resort ofrecía muchas comodidades a los huéspedes.

vertical

The pictures show **vertical** relationships or movement.
*Las imágenes muestran relaciones o movimiento **vertical**.*





Unit 5 – Classroom Lesson – Vocabulary

Duplicate on cardstock and cut apart for word cards.

inhabit

vehicle

conventional

luxury

Unit 5 – Classroom Lesson – Vocabulary

Duplicate on cardstock and cut apart for word cards.

environment

configured

amenities

vertical

Unit 5 – Classroom Lesson – Vocabulary

Duplicate on cardstock and cut apart for word cards.

habitar

vehículo

convencional

lujo

Unit 5 – Classroom Lesson – Vocabulary

Duplicate on cardstock and cut apart for word cards.

ambiente

configurado

comodidades

vertical

Unit 5 Lesson 1 – Classroom Lesson
One per group

Comparison Chart

Work with your teacher and peers to complete the chart.

	Configured as a Cruise Ship	Configured as a Cargo/Military Ship
Purpose		
Amenities		

Materials
- **BLM** Aero-Travel

Math Vocabulary
scale factor
similarity
similar
proportion
percent
ratio
interest
tax

Literature Vocabulary
inhabit
vehicle
conventional
luxury
environment
configured
amenities
vertical

ELPS *(English Language Proficiency Standards):*
2F, 2I, 3D, 3E, 3J, 4F, 5B, 5G

Unit 5, Lesson 1 — Grades 7-8

Math Lesson

Math Objectives:
- Use ratios to determine rates of travel, distances traveled, and time traveled.

Language Objectives:
- Discuss problem solving strategies with peers.
- Write out solutions for solving problems.
- Discuss how to set up ratios to show proportional relationships.
- Explain how to set up a ratio.

Building Background
The Aeroscraft is a remarkable ship, isn't it! There is a great deal of mathematics in the articles you are going to read in class during this Unit. As you can see from the math objectives, today we'll be using the skills we have learned to solve proportionality problems as well as percent problems.

Comprehensible Input
Use the handout students worked on in the Classroom Lesson.

The article tells us that the trip from Los Angeles to New York City will take approximately 18 hours. If the distance between the two cities is 2,451 miles, how fast does the Aerospace intend to cruise? Use ratio to find the answer. First, what are we trying to find?

Aerospace cruising speed. I know that speed can be noted in miles per one-hour *(mph)*. I don't know the distance it travels in one-hour, but I do know I want the one-hour. What is my unknown in this problem?

My unknown is the DISTANCE traveled in one hour. That will be our variable, our ***x***.

Now, what do we know?
Let's gather the data.

Distance between cities is – 2,451 miles
Time to travel that distance – 18 hours

We are going to set up a ratio. It doesn't matter what relationship you have chosen as long as you set up the second ratio using the same relationship.

Here is one relationship. See how it compares with what you set up in the Classroom Lesson.

I know that speed is marked in "miles per hour." So I need to find the unit ratio, a ratio with a denominator of ONE, of an unknown number of miles in one hour. (set up x/1) What is my other ratio?

$$\frac{x \text{ miles}}{1 \text{ hour}} = \frac{2451 \text{ miles}}{18 \text{ hours}}$$

My first ratio shows me the relationship I need in the second ratio, so that is MILES /per hour. The ship can travel 2451 in 18 hours.

My second ratio, then is 2451 MILES / per 18 HOURS. Let's see what *x* is by solving.

(Solve the problem first by simplifying 2451/18 to 817/6 – it's easy to see that both are multiples of 3 using rules of division for 2451. Now cross multiply and solve.)

So x equals 136. What does 136 represent? Miles. See how our labels help us? The Aeroscraft travels an average of 136 miles per 1 hour.

We could have set up the ratio differently, however. Suppose you compared the miles to the miles and the hours to the hours.

$$\frac{2451}{x \text{ miles}} = \frac{18 \text{ hours}}{1 \text{ hour}}$$

Notice that both numerators relate to the 18-hour trip, while the denominators relate to the unit ratio, or the one-hour trip.

As long as you keep the relationships the same, the ratio will be equivalent. *(Solve this one.)* Same result.

The Aeroscraft's expected average speed is 136 miles per hour.
Well, how fast do commercial jumbo jets fly?

The article suggested that it could take as little as six hours on a regular commercial flight. How fast are they flying? How many miles can they travel in one-hour?

What do we want to know? Distance in one-hour

What do we already know? Total distance is about 2451 miles.

It could take as little as six hours to travel by jumbo jet.

(Set up both types of ratios, being sure that you label each part. Talk through each and solve each one at a time.)

409 miles per hour –that's pretty fast!

Let's find out how long a trip it would be for me to travel on the Aeroscraft between Los Angeles and my hometown.

I researched the distance from Los Angeles to San Antonio, TX, and found that it is about 1350 miles. We now know that the average speed, taking in consideration take-off, landing, and slowing down and speeding up for weather conditions, is about 136 miles in one-hour. How long would it take to make the trip from Los Angeles, CA to San Antonio, TX?

What do we want to find out? *(Underline "How long . . .)* So, we are looking for time. That will be our unknown – the variable, x.

What do we know? We know the distance between the two cities is about 1350 miles. We know that the Aeroscraft is traveling an average of 136 miles in one-hour.

Set up your ratio while I set up mine.
(Set up the 1350 miles/x hour = 136 miles/1 hour. Talk through this one, asking questions, and solve it.
Then if time allows, set up 1350 miles / 1 mile – x hours / 1 hour. Talk and solve.)

The trip would take, averaging 136 miles per hour, about 10 hours *(rounding 9.92 to 10).*

Well, how long would it take to drive that far? If you were driving from San Antonio to Los Angeles, you would probably drive Interstate Highway 10 West. The average speed on the highway is 70 miles per hour. Some areas are faster, some slower, but that is the average.

What do we want to know? *(Underline "how long . . .)*
So we want to know the TIME again. TIME is our unknown, which will be our x.

What do we already know? The distance is about 1350 miles.
The Aeroscraft travels an average of 136 miles per hour.

	Unit 5, Lesson 1 **Grades 7-8** **Math Lesson** - continued  --- *(Set up first the 1350 miles / x hours = 70 miles / 1 hour. Talk through and solve. Then set up 1350 miles /70 miles = x hours/ 1 hour. Again, talk through the example in the same way and solve.)* It would take about 19 hours to drive the distance, and that is without any breaks in the driving – that is actual driving time. Tell students that during the Follow-up Lesson they will find out how long it would take them to travel the distance between Los Angeles and several different destinations. **MAS Space** Share with us the strategies used in the CGI problem. If you can, upload a few of your posters showing different strategies. **Objectives** Read through the math and language objectives, making sure that students understand how they accomplished each.

Unit 5 – Math Lesson – Vocabulary

Duplicate on cardstock and cut apart for word cards.

scale factor
similarity
similar
proportion

Unit 5 – Math Lesson – Vocabulary

Duplicate on cardstock and cut apart for word cards.

percent
ratio
interest
tax

Unit 5 Lesson 1 – Math Lesson

One per student

Aero-Travel Problem

Work with your teacher and peers to answer the following question.

The article tells us that the trip from Los Angeles to New York City will take approximately 18 hours. If the distance between the two cities is 2,451 miles, how fast does the Aerospace intend to cruise? Use ratio to find the answer.

Ratio Set-up #1:

Ratio Set-up #2:

Unit 5 Lesson 1 – Math Lesson

One per student

El artículo nos dice que el viaje de Los Ángeles a la Ciudad de Nueva York tomará aproximadamente 18 horas. Si la distancia entre las dos ciudades es de 2,451 millas, ¿Qué tan rápido quiere ir el Aerospace? Usa la proporción para encontrar la respuesta.

Configuración de la razón #1:

Configuración de la razón #2:

Materials
- **BLM** Your Aero-Travel Trip
- **BLM** Recursive Review Problems Lessons 1-3

Math Vocabulary
scale factor
similarity
similar
proportion
percent
ratio
interest
tax

Literature Vocabulary
inhabit
vehicle
conventional
luxury
environment
configured
amenities
vertical

Unit 5, Lesson 1 — Grades 7-8

Follow-up

Math Objectives:
- Use ratios to determine rates of travel, distances traveled, and time traveled.

Language Objectives:
- Discuss problem solving strategies with peers.
- Write out solutions for solving problems.
- Discuss how to set up ratios to show proportional relationships.
- Explain how to set up a ratio.

Practice and Application
Distribute **BLM** Your Aero-Travel Trip. Students should not have any trouble in answering the questions. Make sure that students are labeling each number of their ratios. Do circulate the room, however, to ask questions to clarify and probe for deeper understanding.

QUESTIONS
- What do you want to find out?
- What do you know?
- Explain what each of the parts of these ratios means.
- Which relationship did you set up in your ratio?
- How do you know you have found the relationship that will give you the answer you are trying to find?
- What does your answer represent?

Recursive Review
Please use **BLM** *to answer the Recursive Review questions.*

- A rectangle measuring 3-inches x 5-inches was increased in size by a scale factor of 4. What are the dimensions of the new rectangle?

Writing Topics
Independent Writing Topic
Students will have a daily writing activity which will incorporate the day's focus math vocabulary.

- **How do ratios help you think about relationships?**

Objectives
Review the math and language objectives to make sure that they were accomplished and that the students realize how they were accomplished.

Unit 5 Lesson 1 – Follow-up

Your Aero-Travel Trip

Work with an elbow partner to answer the questions below. You may have different destinations, but the strategies remain the same. Verify each other's work.

1. How long would it take you to travel from Los Angeles to your current town?

2. How long would it take you to travel from Los Angeles to your hometown? If your current town is your hometown, pick your favorite vacation spot and use that as your travel destination.

3. How long would it take you to travel from your current town to your hometown (or favorite vacation spot)?

Unit 5 Lesson 1 – Follow-up

Your Aero-Travel Trip

Trabaja con un compañero para contestar las preguntas a continuación. Tendrán destinaciones diferentes, pero las estrategias con las mismas. Verifica su trabajo.

1. ¿Cuanto tiempo te tomaría viajar de tu ciudad actual a Los Ángeles?

2. ¿Cuánto tiempo te tomaría viajar de tu ciudad natal a Los Ángeles. Su la ciudad donde estés este verano es tu ciudad natal, escoge otro lugar y úsalo como tu destinación.

3. ¿Cuánto tiempo te tomaría viajar entre tu ciudad actual y tu ciudad natal?

Unit 5 Lessons 1-3 – Follow-up

Recursive Review Problems

Solve the recursive review problems using any strategy of your choice.

Unit 5 Lesson 1
A rectangle measuring 3-inches x 5-inches was increased in size by a scale factor of 4. What are the dimensions of the new rectangle?

Unit 5 Lesson 2
Elias left a 20% tip for a food bill of $8.95. How much did he leave for the tip?

Unit 5 Lesson 3
Susan's savings account earns 5% interest each month. If she opened the account with $200 on June 1, and did not deposit or withdraw any money, what was her balance at the end of July?

Materials
- 3 Laughing Cow Cheese wedges
- 1 plastic knives
- 2 paper dessert plates
- 2 paper towels

All items listed above per partner pair
- **BLM** Laughing Cow Cheese-Snack Fractions

Math Objectives
- Use addition, subtraction, multiplication and division to solve problems involving fractions and decimals.
- Convert between fractions, decimals, whole numbers and percents.
- Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios).
- Estimate and find solutions to application problems involving percent.

Language Objectives
- Discuss how ratios and proportions can be used to solve real-world problems.

Math Vocabulary
scale factor
similarity
similar
proportion
percent
ratio
interest
tax

Literature Vocabulary
inhabit
vehicle
conventional
luxury
environment
configured
amenities
vertical

Unit 5, Lesson 1 — Grades 7-8

Snack Fractions

Students should wash their hands before this activity if using food items.

Snack Fractions
Students should have the skills to answer these in small groups. Have the students work through the BLM before sharing the actual snack.

Circulate the room while students are working on the BLM, asking questions as needed to guide, redirect, extend:

QUESTIONS
- Can you explain how to find your fourth?
- Why did you choose that strategy?

Finally, let them share the guacamole (or other dip) with a partner.

(*Naturally, if you think the portions suggested in the materials list are too small for a middle schooler's snack, feel free to increase the amounts; make sure, though, that you make the amounts easily divided in halves – they've already done a great deal of work to get the snack.)*

Snack Fraction Journal Writing: BLM Laughing Cow Cheese Fractions
Explain how you know you have fair shares of the cheese wedges when sharing among four people.

Objectives: Review the objectives with the class, making sure they understand how they achieved each.

Unit 5 Lesson 1 – Snack Fraction

One per student

Laughing Cow Cheese Wedge – Snack Fractions

Work with your partner to solve the problems.

1. Divide the cheese wedges between you and your partner. Use pictures, numbers, and words to explain how your two shares combine to make three wholes.

2. Use the picture below to model how the cheese would have been shared between four people. What is the fractional representation of your portion now? Compare that to the half you originally received.

3. What is the percent decrease in your share from half to a fourth?

Unit 5 Lesson 1 – Family Fun

Dear _____,

We read the article "Frankenstein of the Skies" in class today.

It was about…

_____
_____
_____
_____
_____
_____

One of the math concepts we used from the article was…

_____
_____
_____
_____
_____
_____

Sincerely,

_____

Materials
- **BLM** Aeroscraft Investigation (2 of 3)-Measurement Lab Record Sheet
- **BLM** Solve It! Problems 3-4
- **BLM** Fraction Action and *X* Marks the Spot
- **BLM** Lessons 1-3 CGI *Aerospace Articles*

Math Objectives
- Solve word problems using a variety of strategies and defend their strategies.
- Model and solve 3-step word problems.
- Compose and decompose values to show a new representation of the value.
- Find equivalent fractions.

Language Objectives
- Speak to partners, teacher, and class using vocabulary.
- Discuss problem solving process and strategies.
- Explain how they decided to rename the target number.

Math Vocabulary
scale factor
similarity
similar
proportion
percent
ratio
interest
tax

Literature Vocabulary
inhabit
vehicle
conventional
luxury
environment
configured
amenities
vertical

Unit 5, Lesson 2 — Grades 7-8

Daily Routine

The following daily activities will help prepare your students for the Post-assessment. They are not optional.

ESSENTIAL

Measurement Lab
- Lesson 1 – Aeroscraft Investigation (1 of 3)
- **Lesson 2 – Aeroscraft Investigation (2 of 3)**
- Lesson 3 – Aeroscraft Investigation (3 of 3)

Lesson 2 Materials
- trundle wheel
- primary timers
- distance markers

Lesson 2 Student Groups
1) Students revisit Distance #1.
2) From the starting point on of Distance #1, use the trundle wheel and mark off a length of 231 feet 10 inches.
3) Label it as Boeing 747.
4) From the starting point of Distance #1, use the trundle wheel and mark off a length of 242 feet 4 inches.
5) Label it as Boeing 777.
6) Groups will calculate the ratio of the length of the Aeroscraft (Distance #1) to the length of each plane.
7) Groups answer the question "How many of these planes laying end-to-end would fit inside the Aeroscraft?"

Solve It! Multi-step problem solving
- Lesson 1 – pairs, related 3-step problems
- **Lesson 2 – pairs, 3-step problem**
- Lesson 3 – pairs, each have a 3-step problem

Fraction Action
- Lesson 1 – BLM Fraction Action and X Marks the Spot
- **Lesson 2 – BLM Fraction Action and X Marks the Spot**
- Lesson 3 – BLM Fraction Action and X Marks the Spot

***X* Marks the Spot**
- Lesson 1 – BLM Fraction Action and X Marks the Spot
- **Lesson 2 – BLM Fraction Action and X Marks the Spot**
- Lesson 3 – BLM Fraction Action and X Marks the Spot

Assessment Items Students are introduced to and practice the skills necessary for success on the following assessment items: 1, 2, 3, 6, 9	**Unit 5, Lesson 2** **Grades 7-8** **Daily Routine** - continued  **----------** **CGI** • Lesson 1 – rate, measurement division • **Lesson 2 – rate, multiplication (assessment item 7)** • Lesson 3 – price, partitive (assessment item 6) **----------** **The following activities, although certainly developmentally appropriate for your 7th and 8th grade students, do not specifically address objectives assessed on the Post-assessment. Schools with shorter teaching spans can consider omitting some or all these activities as your time permits.** **----------** **OPTIONAL** **Target Number** • Lesson 1 – Target Number 10 • **Lesson 2 – Target Number 30** • Lesson 3 – Target Number 60 **Money Matters** (*If you have a full program and wish to use this optional activity, you will find BLMs and Explanations in the Optional Activities Tab of your Teacher's Guide*.)

Unit 5 Lesson 2 – Daily Routines - Measurement Lab

One per student

Aeroscraft Investigation (2 of 3) – Measurement Lab Record Sheet

Students should work in small groups.

Materials:

- trundle wheel
- primary timers
- distance markers

Task:

1) Begin at the starting point of Distance #1, use the trundle wheel and mark off a length of 231 feet 10 inches. Label it as Boeing 747.

2) From the starting point of Distance #1, use the trundle wheel and mark off a length of 242 feet 4 inches. Label it as Boeing 777.

3) Calculate the ratio of the length of the Aeroscraft (Distance #1) to the lengths of the other planes.

4) How many of these planes laying end-to-end would fit inside the Aeroscraft?

Unit 5 Lesson 2 – Daily Routines - Solve It! Problems (Pairs)

One per student

Partner #1 - Problem 3:

There was a lot more to the dog walking business than Blia and Nu had known when they first started. They were able to continue the two 25-minute walk visits five times a week. But they found that they each could handle more than one dog at a time on several of the visits. They decided that to be fair to their customers, if more than one dog was being walked at a time, they would charge by the dog. $9 each seemed fair. Blia had one very dominant dog on her first visit every day, so she decided he was enough to handle and charged the $16. But her second daily visit she had three dogs. What did she make at the end of that week?

Problem Solution Name:	**Solution Verification** Name:

Unit 5 Lesson 2 – Daily Routines - Solve It! Problems (Pairs)

One per student

Partner #2 - Problem 4:

Once Blia and Nu decided they could handle more than one dog at a time for $9 a dog (instead of the flat $16 a walk), Nu found several more dogs to walk on her visits. She had three on her first visit of the day and four on the second visit of the day. That meant, though, that she needed more sturdy leashes, so she bought six more leashes at $12.95 each. What was her profit at the end of the week?

Problem Solution Name:	**Solution Verification** Name:

Unit 5 Lesson 2 – Daily Routines – Fraction Action and *X* Marks the Spot

One per student

Fraction Action

Materials:
None for this activity

Task:
Roberto caught 17 pounds of fish on Monday. That was 4 1/2 times as many pounds of fish as he caught on Saturday. How many pounds of fish did Roberto catch on Saturday?

X Marks the Spot

Solve for *x*.

$$\frac{3}{4}x - 6 = 69$$

Materials

- **BLM** Vocabulary Pictures for each word
- **BLM** Comparison Chart

Literature Selection

Article – "The Flying Luxury Hotel"
http://www.cnn.com/2006/TECH/02/16/aeroscraft/

Math Vocabulary

scale factor
similarity
similar
proportion
percent
ratio
interest
tax

Literature Vocabulary

inhabit
vehicle
conventional
luxury
environment
configured
amenities
vertical

Unit 5, Lesson 2 Grades 7-8

Classroom Lesson

Every day teachers must post the objectives on the board, read them to the students, and have students read them together with the teacher. At the end of the lesson, teacher and students should review to see if they have accomplished both math and language objectives.

Math Objectives:

- Use ratios to determine rates of travel.

Reading Objective:

- Compare and contrast information from a second science feature article.

Language Objectives:

- Explain vocabulary words to the class using definitions, sentences, examples, and pictures.
- Discuss problem solving strategies.

Practice and Application - Vocabulary
Vocabulary activity: "You're the teacher"

1. Divide the class into eight groups, one group for each vocabulary word.

2. Give the students the word card and the word picture poster for that word.

3. Students' task is to become the teacher and explain this word to the class to help them understand it more fully. To do this, they need to prepare by thinking of different ways they can teach the word to the class. Explain to students that they can:
   - **Write a definition for the word**
     Have dictionaries/Internet dictionaries available for reference, and then help students put the definition into their own words so it makes sense to other students.
   - **Draw a picture to illustrate the word's meaning**
   - **Write different sentences using the word**
     Students could search the word on Internet and use those examples to help them write their own sentences.
   - **Write different examples of the word**
     Students could search the word on Internet and use some of those examples.

Classroom Lesson - continued

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4. While students are working, circulate and help them create the above strategies.

5. Have each group teach their word to the class, using what they've written and drawn.

DURING READING

Comprehensible Input – Literature: Article #2

Give each student a copy of the article "The Flying Luxury Hotel" so they can follow along with the text as you read. This visual support will be helpful for students, since this feature article is complex *(more so than the first article).*

Leave the mystery picture as the focal point as you read aloud the article: "The Flying Luxury Hotel of Tomorrow." http://www.cnn.com/2006/TECH/02/16/aeroscraft/

Throughout the Reading: Impromptu Vocabulary Explanations

There will be words you will need to briefly stop and define for students such as "dirigible," "rigid," and "aerodynamic." Please pause just long enough to give students a feel of the word so they will better understand the article. Keep in mind that this is a complex article with many words that will be unfamiliar for students – instead of stopping to explain all of them, choose the words you think are *most essential* to students' understanding of the important parts of the article.

Throughout the Reading: Comparing and Contrasting

In this lesson, you will continue to practice this reading strategy with students to help them understand how the Aeroscraft is similar to and different from a conventional airplane. Use the Venn Diagram you already have started from Lesson 1. As you read, pause after different paragraphs to ask students questions "compare and contrast" questions:

- Example Teacher Questions:
  - What did we learn in this part about the Aeroscraft vehicle?
    - How is that different from a conventional airplane?
    - How is that similar to a conventional airplane?

As students compare and contrast, add any new details they learn in this article to the Venn Diagram from Lesson 1. Some of the information in this article is the same as the first *(for example, that the Aeroscraft is about 2 football field long)*. When you read similar information, you can point out where it is already written in the Venn Diagram.

Technology Option

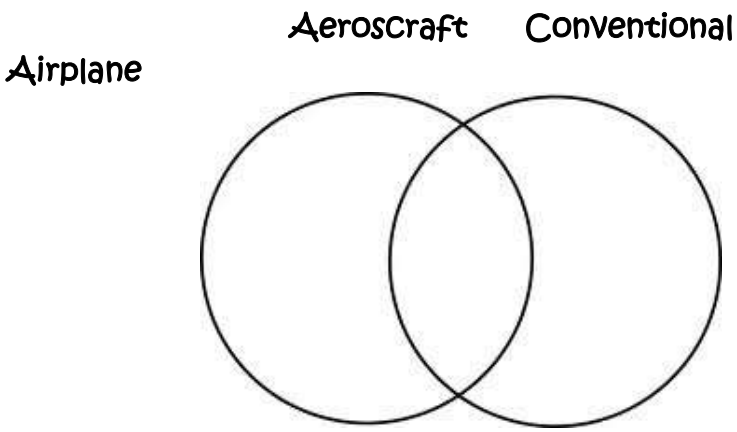
Students may use the Inspiration, Prezi, PowerPoint to present their vocabulary words to the rest of the class.

Independent Reading

Have students listen to "The Flying Luxury Hotel" in a Listening Center as part of their independent reading time.

Beginning ELLs: Benefit from listening to a text repeatedly to connect oral and written language.

Intermediate & Advanced ELLs: Benefit from listening to a text repeatedly to develop fluency, and reading along softly when possible. Using the podcast tool on MAS Space, have students choose their favorite part of the article and record themselves reading that part aloud. Then, they listen to that particular part several times, reading along softly. When they feel they've had enough time to practice, they record themselves reading that page again. Have students compare their two recordings to see how their fluency has improved.



AFTER READING
Practice and Application – Literature & Vocabulary
Highlighting activity

1. Give students highlighters.

2. Have students work with a partner to highlight information on their copy of "The Flying Luxury Hotel" that would fit in the chart they started in Lesson 1. Some of the information they highlight will be the same as what is already written in the chart, and some will be new information.

3. Circulate as students are working, and help them find information in the article to highlight.

   ELLs: You can use this time to meet with a small group of ELLs to help them highlight the key details from the text.

4. Regroup the class. Have students share the information they highlighted. Refer to the enlarged version of the Chart you created in Lesson 1, and see if that information is already written on the chart. If it's not, add it to the chart. There is some new information you can add to the chart, as shown below in red.

Example of Completed Chart, based on information added from "The Flying Luxury Hotel":

	Configured as a Cruise Ship	Configured as a Cargo/Military Ship
Purpose	- A way to travel in luxury, and enjoy the trip. - A way to see beautiful views of the land below.	- An easy way to transport troops AND their equipment so everything arrives together at the same time. - An easy way to ship everything a store or an oil rig needs.
Amenities	- Restaurants - Nightclubs - Spas - Casinos - Sleep cabins - well-appointed state rooms - one-acre sized cabin for all of these amenities - windows to look at national landmarks	- A large, open space to hold 500 tons of cargo (troops and equipment) - space for a whole store's worth of merchandise - space for a year's worth of supplies for an offshore oil rig - ability to land in the snow or water

Transition to Math

Have student volunteers talk about how they solved the follow-up lesson activity from Lesson 1. Be sure that you are encouraging multiple strategies. Always ask, "Did someone solve this in a different way?" then let them present. Other students should be able to ask questions in a positive manner.

Objectives

Review both language and math objectives, making sure students understand how they accomplished each.

Materials
- paper and pencil

Math Vocabulary
scale factor
similarity
similar
proportion
percent
ratio
interest
tax

Literature Vocabulary
inhabit
vehicle
conventional
luxury
environment
configured
amenities
vertical

Unit 5, Lesson 2 — Grades 7-8

Math Lesson

Math Objectives:
- Use any strategy to solve percent problems including percent discounts, interest, and tips.

Language Objectives:
- Discuss problem solving strategies with peers.
- Write out solutions for solving problems.
- Discuss how to set up percent discount problems.
- Explain how to solve tip and interest problems.

Building Background
This is certainly not like flying in a jumbo jet today. Sleeping rooms, restaurants, observation areas, casino – it does resemble an ocean going cruise ship. This is a picture of the Queen Mary 2, a very luxurious cruise ship. *(photo)* What if you were traveling on the ship – what would it cost you in tips? Might there be discounts? Suppose you were working on the ship and saving your money. What could you expect to earn in interest in a saving account? These are questions we'll try to estimate answers for today.

Comprehensible Input
Have the students title a piece of notebook paper for today's lesson. We will work on several different problems and they can record their work on regular paper this time. You may have them number the problems you can get through today for easy referencing.

First let's figure pricing. The article from Lesson 1 compared the price of the Aeroscraft to a First Class Ticket.

First Class tickets on a jumbo jet for a one-way ticket from Los Angeles to New York City, NY cost $2158. This price does include a meal and a snack, plus free beverages on the trip.

An Economy class for the same trip costs $389.

What is the percent of discount for an economy class ticket?

What do we want to find out? *(Underline percent of discount.)*
Percent of discount. That will be our x

What do we know? First class ticket is $2158. Economy class is $389.

How would you find the percent of discount? What would you do? Talk to in your classroom for just a few seconds to see if you have a strategy for solving this. *(Pause for a brief discussion.)*

There are many ways. I'm going to reason through this one.

So what I know is that if I take the $2158 and I subtract **some percent of that $2158** my answer will equal $389. Let's translate that into an equation.

Full Price subtract the *(% off full price)* = discounted price.

We already said that our ***x*** would be the percent of discount, so let's substitute the data into the problem. (*Place the following under the above verbal equation so students see the correlation.)*

2158 – (2158x) = 389

I know that I want *x* by itself, but I also know that I want a POSITIVE *x*, not a negative *x*. What should I do first? *(pause)*

I'm going to add (2158x) to both sides. Please do that on your papers while I do the arithmetic on mine. *(do so)*

2158 – (2158x) + (2158x) = 389 + (2158x)

2158 = 389 + (2158*x*)

Now let's start getting the x by itself. What do you think is the easiest step to take now? *(pause)* On the side of the equation with the ***x*** I have 389. Let's subtract that. *(do so)*

2158 – 389 = 389 – 389 + (2158*x*)

1769 = 2158*x*

What would you do now? *(pause)* I see that the ***x*** is being multiplied by the 2158, so let's divide by 2158. We could do that long handed, but let's use the calculator to speed things up a bit. *(do so)*

1759/2158 = 2158*x* / 2158

0.819 = *x*

What does the answer represent? *(pause)* We originally said that x would represent our percent. Percent is PER 100, so we need an answer that in the hundredths. What is the approximate percent then? *(pause)*

Round to hundredths = 0.82 or 82/100 or about 82%.

So, an economy ticket with American Airlines currently is about an 82% discount of a first class ticket. Do you suppose that they will offer discounts on the Aeroscraft? In my research I found that on a cruise ship the "ocean view" rooms cost more than the inside rooms.

The article in today's Lesson compared the Aeroscraft to the Queen Mary 2. For a seven day cruise, an ocean-view cabin costs $1099. The inside cabin costs $899. What is the percent of discount of the ocean-view cabin discounted for the inside view? What do we want to find out? Percent of discount. So that is *x*

What do we know? The ocean-view cabin costs $1099. The inside view costs $899.

So Ocean-view – *(% of ocean-view)* = inside view

$1099 – (1099*x*) = $899

(Solve in the same manner, making sure you give students the opportunity of discussion in the classroom – about 18%.)

This is a pretty small sampling, but it appears that cruise ships do not offer as large a percent of discount as airlines do for first and economy seating. Of course, you are on a cruise ship much longer than a jumbo jet; and your food is provided on an ocean liner, unlike the airplane.

Let's take a look at those who will work on the Aeroscraft, perhaps wait staff in one of the restaurants. Let's say that the waiter lived on his salary and saved his tips.

One waiter can serve 20 people. On the Queen Mary 2, the meals are included in the price of the ticket, and the tip is included in the price of the ticket; but the meals are valued at an average of $45 per meal. If the waiter serves 20 people three meals a day for seven days, what tip can he expect at the end of the cruise?

What do we want to find out? What tip can the waiter make?

Daily per waiter	Extension	7-day Cruise
20 people per waiter 3 meals per day average $45 per meal average 7 days of meals 15% tip	60 meals per day $2700 per day $405 tips per day	420 meals per cruise $18,900 per 7-days $2835 tips per 7 days

Unit 5, Lesson 2 — Grades 7-8

Math Lesson - continued

There is a lot of information in this problem. Let's take it just a little at a time. First of all, how many meals a day will he serve? How will you find that? *(pause)* We don't need the calculator for that one – that should be mental math.
(20 people x 3 meals = 60 meals per day)
Let's put that in our extension column.

How many meals is that in 7 days? Again, another mental math problem.
60 daily meals x 7 days = 420 meals
That goes in our 7-day cruise column.

What is the average spent on meals in those 7 days? OK, I'm going to use the calculator on this one.
(420 meals x $45 per meal = $18,900 spent in meals in 7 days for 20 people)

If the waiter is given tips of 15% on that amount, what will he make in tips?
($18,900 x 0.15 = $2835)

He can make two 7-day trips in a month. What will he make on average in tips? $5670.

That's a lot of money! And those are tips, not his salary. Now, what if he banks that money and makes 4% that month. What would he earn? Let me give you a little time to calculate that one.

If he banks $5670, and makes 4% that month, what will he earn on his money that month?

$226.80 (5670 x 0.04) That's the interest he is paid just for leaving his money in the savings account.

His money is working almost as hard as he is.

MAS Space
After you finish the measurement lab, share your ratios and your thoughts with us online.

Objectives:
Read through the math and language objectives, making sure that students understand how they accomplished each.

Materials
- **BLM** Luxury Hotel in the Sky
- **BLM** Recursive Review Problems Lessons 1-3

Math Vocabulary
scale factor
similarity
similar
proportion
percent
ratio
interest
tax

Literature Vocabulary
inhabit
vehicle
conventional
luxury
environment
configured
amenities
vertical

Unit 5, Lesson 2 — Grades 7-8

Follow-up

Math Objectives:
- Use any strategy to solve percent problems including percent, discounts, interest, and tips.

Language Objectives:
- Discuss problem solving strategies with peers.
- Write out solutions for solving problems.
- Discuss how to set up percent discount problems.
- Explain how to solve tip and interest problems.

Practice and Application
Distribute the **BLM** Luxury Hotel in the Sky for this lesson. Students should not have any trouble in answering the questions. Do circulate the room, however, to ask questions to clarify and probe for deeper understanding.

QUESTIONS
- What do you want to find out?
- What do you know?
- Explain what each of the parts of equation represents.

Recursive Review
Please use **BLM** *to answer the Recursive Review questions.*

- Elias left a 20% tip for a food bill of $8.95. How much did he leave for the tip?

Writing Topics
Independent Writing Topic
Students will have a daily writing activity which will incorporate the day's focus math vocabulary.

- **Explain how to find the amount of money earned for a certain percent of interest.**

Objectives
Review the math and language objectives to make sure that they were accomplished and that the students realize how they were accomplished.

Unit 5 Lesson 2 – Follow-up

One per student

Luxury Hotel in the Sky

Students will work in small groups to complete the activity.

1. You are a passenger in the year 2020 on the Aeroscraft. A window-view stateroom ticket is $3645. The staterooms without windows are $2256. What is the percent of discount for the room without a window?

American Airlines:
- One way first class ticket – $2158
- One way economy ticket – $389

Queen Mary 2:
- carries 2620 passengers
- A 7-day cruise costs:
  - ocean-view cabin – $1099 for an
  - inside cabin – $899

One waiter can serve 20 people.

Meals are valued at an average of $45 each.

3 full meals, requiring wait staff, are served a day.

2. You are talking with one of the waiters on the ship and find that he works 8 days on and 8 days off in every month. If his tips are very similar to those made on an ocean liner, what tip money would he make in one month?

3. If he invested the money and earned 22% on his money the first month, what was the amount of the earnings?

Unidad 5

Lección 2 – Lección de Seguimiento – Hotel de Lujo en el Cielo

Eres un pasajero en el año 2012 en el Aeroscraft. Un camarote con ventana cuesta $3645. Los camarotes sin ventanas cuestan $2256. ¿Cuál es el porcentaje de descuento para los camarotes sin ventana?

Un boleto de ida de primera clase - American Airlines - $2158
Un boleto de ida de clase económica – American Airlines - $ 389

Queen Mary 2 lleva 2620 pasajeros
Un crucero de 7 días cuesta:

- $1099 por una cabina con vista del mar
- $899 por una cabina sin vista

Incluye alojamiento, transporte, entretenimiento fabuloso y actividades diarias, comidas y algunas bebidas, los cargos de los puertos y más.

Un camarero puede servir a 20 personas.

Las comidas tienen un valor promedio de $45 cada uno.

3 comidas con servicio de mesa se sirve cada día.

Estás hablando con uno de los meseros de la nave y te das cuenta de que él trabaja 8 días sí y 8 días no en cada mes. Si sus propinas son muy similares a las que ganaría en un crucero, ¿Cuánto dinero en propinas ganaría en un mes?

Si él invirtió el dinero y ganó 22% de su dinero el primer mes, ¿Cuál fue la cantidad de sus ganancias?

Materials
- 2 paper dessert plates
- 2 paper towels
- 1 plastic knife
- 4 graham crackers
- 2T Nutella

All items above per partner pair
- **BLM** Crackers and Nutella-Snack Fractions ***Allergy Warning – Please substitute a different spread for the entire class if nut allergies are present.***

Math Objectives
- Use add, sub., mult. and div. to solve problems involving fractions and decimals.
- Convert between fractions, decimals, whole numbers and percents.
- Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios).
- Estimate and find solutions to application problems involving percent.

Language Objectives
- Discuss how ratios and proportions can be used to solve real-world problems.

Math Vocabulary
scale factor
similarity
similar
proportion
percent
ratio
interest
tax

Literature Vocabulary
inhabit
vehicle
conventional
luxury
environment
configured
amenities
vertical

Unit 5, Lesson 2 — Grades 7-8

Snack Fractions

Students should wash their hands before this activity if using food items.

Snack Fractions
Students should have the skills to answer these in small groups. Have the students work through the BLM before sharing the actual snack.

Circulate the room while students are working on the BLM, asking questions as needed to guide, redirect, extend:

QUESTIONS
- What does this ratio mean?
- How did you determine the equivalent ratio?
- Explain how you used ratios in this activity.

Finally, let them share the trail mix with a partner.

(*Naturally, if you think the portions suggested in the materials list are too small for a middle schooler's snack, feel free to increase the amounts; make sure, though, that you make the amounts easily divided in halves – they've already done a great deal of work to get the snack.)*

Snack Fraction Journal Writing: BLM Crackers and Nutella Snack Fractions
Explain your strategy for finding the percent of decrease.

Objectives: Review the objectives with the class, making sure they understand how they achieved each.

Unit 5 Lesson 2 – Snack Fractions

One per student

Crackers and Nutella – Snack Fractions

Work with your partner to solve the problems.

1. Once you have shared your Crackers and Nutella, use pictures, numbers and words to describe how your two shares combine to make 100%.

2. Now, pretend that there were six of you. First, draw a picture of how the snack foods would be shared among you. Then tell what percent of the snack your portion would be. Show your work.

3. What is the percent of decrease in your share from half to one-sixth?

Unit 5 Lesson 2 – Family Fun

Dear _____,

We continued reading about the Aeroscraft and how it works.

My favorite math activity related to the story today was…

_____

because…

_____

_____

_____

_____

_____

Sincerely,

_____

Materials
- **BLM** Aeroscraft Investigation (3 of 3)-Measurement Lab Record Sheet
- **BLM** Solve It! Problem 5
- **BLM** Fraction Action and *X* Marks the Spot
- **BLM** Lessons 1-3 CGI *Aerospace Articles*

Math Objectives
- Solve word problems using a variety of strategies and defend their strategies.
- Model and solve 2-step word problems.
- Compose and decompose values to show a new representation of the value.
- Find equivalent fractions.

Language Objectives
- Speak to partners, teacher, and class using vocabulary.
- Discuss problem solving process and strategies.
- Explain how they decided to rename the target number.

Math Vocabulary
scale factor
similarity
similar
proportion
percent
ratio
interest
tax

Literature Vocabulary
inhabit
vehicle
conventional
luxury
environment
configured
amenities
vertical

Unit 5, Lesson 3 Grades 7-8

Daily Routine

The following daily activities will help prepare your students for the Post-assessment. They are not optional.

ESSENTIAL

Measurement Lab
- Lesson 1 – Aeroscraft Investigation (1 of 3)
- Lesson 2 – Aeroscraft Investigation (2 of 3)
- **Lesson 3 – Aeroscraft Investigation (3 of 3)**

Lesson 3 Materials
- trundle wheel
- primary timers
- distance markers

Lesson 3 Student Groups
1) Students revisit Distance #1 (length of Aeroscraft).
2) Using the trundle wheel, groups measure and mark the width, (cabin width) of the Aeroscraft.
3) Compare the Aeroscraft cabin width to the cabin widths of the Boeing 747 (20 feet) and Boeing 777 (36 feet).
4) Groups answer the question "What is the percent of difference in the Aeroscraft width and the two jumbo jet commercial airliners?"

Solve It! Multi-step problem solving
- Lesson 1 – pairs, related 3-step problems
- Lesson 2 – pairs, 3-step problem
- **Lesson 3 – pairs, 3-step problem**

Fraction Action
- Lesson 1 – BLM Fraction Action and X Marks the Spot
- Lesson 2 – BLM Fraction Action and X Marks the Spot
- **Lesson 3 – BLM Fraction Action and X Marks the Spot**

***X* Marks the Spot**
- Lesson 1 – BLM Fraction Action and X Marks the Spot
- Lesson 2 – BLM Fraction Action and X Marks the Spot
- **Lesson 3 – BLM Fraction Action and X Marks the Spot**

CGI
- Lesson 1 – rate, measurement division
- Lesson 2 – rate, multiplication (assessment item 7)
- **Lesson 3 – price, partitive (assessment item 6)**

Assessment Items Students are introduced to and practice the skills necessary for success on the following assessment items: 1, 2, 3, 6, 9	**Unit 5, Lesson 3** **Grades 7-8** **Daily Routine** - continued  **----------** **The following activities, although certainly developmentally appropriate for your 7th and 8th grade students, do not specifically address objectives assessed on the Post-assessment. Schools with shorter teaching spans can consider omitting some or all these activities as your time permits.** **----------** **OPTIONAL** **Target Number** • Lesson 1 – Target Number 10 • Lesson 2 – Target Number 30 • **Lesson 3 – Target Number 60** **Graphing:** *Omitted for this Unit* **OPTIONAL** **Money Matters** (*If you have a full program and wish to use this optional activity, you will find BLMs and Explanations in the Optional Activities Tab of your Teacher's Guide*.)

Unit 5 Lesson 3 – Daily Routines - Measurement Lab

One per student

Aeroscraft Investigation (3 of 3) – Measurement Lab Record Sheet

Students should work in small groups.

Materials:

- trundle wheel
- primary timers
- distance markers

Task:

Students revisit Distance #1 (length of Aeroscraft).

1) Using the trundle wheel, measure and mark the width (cabin width) of the Aeroscraft.

2) Compare the Aeroscraft cabin width to the cabin widths of the Boeing 747 (20 feet) and Boeing 777 (36 feet).

3) What is the percent of difference in the Aeroscraft width and the two jumbo jet commercial airliners?"

Unit 5 Lesson 3 – Daily Routines - Solve It! Problems (Pairs)

One per student

Solve your own problem today, showing your work.

Partner #1 - Problem 5:

After the second month of walking dogs, Blia and Nu were very comfortable with their routines. They each had multiple dogs per visit this month. Blia's first visit was now two dogs at $9 each; Nu's first visit was four dogs at $9 each; both had three dogs on their second visit at $9 each. Blia found a new waste disposal system with shovel and bags. Each had purchased two sets at $8.59, and they shared the cost of buying five packages of 72 refill bags at $9.43 each. Business was good! They both put 10% of their earnings into a savings account. What was their combined profit, excluding the savings, after these 20 days?

Problem Solution Name:	**Solution Verification** Name:

Unit 5 Lesson 3 – Daily Routines – Fraction Action and *X* Marks the Spot

One per student

Fraction Action

Materials:
None for this activity

Task:

Gabriella's soup recipe calls for $4\frac{1}{2}$ cups of broth along with the vegetables and meat. If she is to cook the recipe until the broth is reduced by 15%, how many cups of broth will be left?

X Marks the Spot

Write a word problem that this equation represents. Then solve for *x*.

$4x + 3 = 19$

Materials
- Vocabulary BINGO card
- Vocabulary BINGO instructions found in Activity 9 on website: http://www.teachnet.com/lesson/langarts/wordwall062599.html
- **BLM** – Math, practice / application – completed yesterday
- **BLM** Queen Mary 2 Photograph
- highlighters
- CLASSROOM set of articles for the lesson.

http://www.teachnet.com/lesson/langarts/wordwall062599.html

Literature Selection
Article – "How the Aeroscraft will Work"
http://abcnews.go.com/Technology/story?id=1644771&page=1

Math Vocabulary
scale factor
similarity
similar
proportion
percent
ratio
interest
tax

Literature Vocabulary
inhabit
vehicle
conventional
luxury
environment
configured
amenities
vertical

ELPS *(English Language Proficiency Standards):*
2D, 2E, 2I, 3D, 3F, 4G, 4J, 5B

Unit 5, Lesson 3 — Grades 7-8

Classroom Lesson

Every day teachers must post the objectives on the board, read them to the students, and have students read them together with the teacher. At the end of the lesson, teacher and students should review to see if they have accomplished both math and language objectives.

Math Objectives:
- Compare problem solving strategies with peers.

Reading Objective:
- Summarize learning about the Aeroscraft.
- Paraphrase key details from a science feature article.

Language Objectives:
- Summarize learning about the Aeroscraft.
- Discuss how the Aeroscraft will work.
- Discuss problem solving strategies.
- Explain problem solving strategies to peers.

BEFORE READING
Building Background – Literature and Vocabulary
Summarizing
Have students summarize what they have learned this week about the Aeroscraft. They can refer to the Venn Diagram and the Chart from Lessons 1 and 2. Have students first share with a small group, and then have groups share with the class. Help students use the literature vocabulary when appropriate.

DURING READING
Comprehensible Input – Literature: Article #3
Today's article is very ambitious. It is a highly scientific text with many unfamiliar vocabulary words and science concepts. It is unrealistic to try explaining every single unfamiliar word *(and science concept)* to students. Instead, today's reading is designed to help students tackle a challenging text by gleaning the key details from each paragraph. You will help them paraphrase the key information in their own words, to express these complex concepts with everyday words.

Leave the mystery picture as the focal point as you read aloud the article: "How the Aeroscraft will Work" http://abcnews.go.com/Technology/story?id=1644771&page=1.

Paraphrasing Activity

Give each student a copy of this feature article. Explain to students that this article is about how the Aeroscraft works. It is very scientific and technical, written for scientists. Explain that our goal is to just pick out the most basic information about how the Aeroscraft works. That means we need to not worry about all of the other science concepts and words we don't understand, and instead we can just focus on figuring out the most important information from each section.

- First have students examine the photographs in the article, and the labeled diagram. Read the labels together. What do they think each part of the Aeroscraft is for?

- **Introduction**
  - Before reading this section, explain that the Introduction will have some of the same information they've already learned.
  - Display the following question: "**How does the Aeroscraft float?**" Tell students that as you read aloud, you want them to be watching for information that talks about how the Aeroscraft floats.
  - Read aloud the introduction, pausing as needed to explain ONLY the most vital words necessary for understanding how the Aeroscraft floats.
  - After you read the introduction, have students look for the part that answers the question. Talk about that part together, pulling out the most basic facts. Help students explain that information in their own words to answer the question.

- **Operating the Aeroscraft**
  - Display the following question: "**How does the Aeroscraft move?**" Tell students that as you read aloud, you want them to be watching for information that talks about how the Aeroscraft moves.
  - Read aloud the paragraph, pausing as needed to explain ONLY the most vital words necessary for understanding how the Aeroscraft moves.
  - After you read the paragraph, have students look for the details that answer the question. Talk about the details together, pulling out the most basic facts. Help students explain that information in their own words to answer the question.
  - Repeat these steps for the next paragraph, posting a new question: "**How many people are needed to operate the Aeroscraft?"**

Writing Connection

You can have students write down the paraphrased responses they generate as a class for each question. This helps students record the most important information from the article, and afterwards they can go back and reread these key details to solidify their comprehension of the text.

Or, you can use Shared Writing to write down what students say for each question, writing it somewhere the whole class can see, such as on chart paper or projected onto a screen.

Language Extension
Guess My Word
Whenever you have a few extra minutes during the rest of the week, you can continue to help students review all of the summer vocabulary by playing a quick game of "Guess My Word." Choose a word from the wall, and give students clues to determine which word it is. This is a great "filler" activity, and a fun way to provide continued practice with the vocabulary words.

- **Proposed Uses**
  - Repeat these same steps for this section, displaying the following three questions as you progress through the section:
    - **"Why would the Aeroscraft be like a luxury cruise ship?"**
    - **"Why would the Aeroscraft be a good cargo ship?"**
    - **"How else could people use the Aeroscraft?"**

Note: Students will need the information in the yellow box on page three of the article for the TV lesson, as well as the knowledge gleaned from the reading.

AFTER READING
Personal Response and Evaluation
Ask students what their opinion of the Aeroscraft is. Do they think this type of vehicle is a good idea? Would they travel in an Aeroscraft? What amenities would they want to have on the Aeroscraft?

Practice and Application - Vocabulary
BINGO Game

- Tell students that you are going to practice summer vocabulary today.

- Read each word on the word wall with the students, and have students share which book each word came from. How was the word used in that book?

- Note the words that gave students difficulty, and separate them to one side. These will be the words students can choose from for their BINGO boards. Pull enough words so you have at least 30 from which to choose.

- Use the BLM provided, and the directions found: http://www.teachnet.com/lesson/langarts/wordwall062599.html **Activity 8.**

- Play Vocabulary BINGO as per instructions on the noted website. Students should select words today for the BINGO cards from the words you have selected.

Source of "mystery picture:" http://www.news.com/2300-11397_3-6046252-1.html	**Unit 5, Lesson 3** **Grades 7-8** **Classroom Lesson** - continued --- When the game is over, and someone has made BINGO, let students share their cards with other students, reading words to one another and using the words in sentences **TRANSITION MATH** **Building Background – Math** Have student volunteers talk about how they solved the follow-up lesson activity from Lesson 2. Be sure that you are encouraging multiple strategies. Always ask, "Did someone solve this in a different way?" Then let them present. Other students should be able to ask questions in a positive manner. Please read through Lesson 2 TV Lesson if you have questions about expectations. These are certainly not the only strategies that can be used to solve the problems; however, if students do not already have their own strategies, these will help them see the relationships in order to solve the problem. **Objectives** Review both language and math objectives, making sure students understand how they accomplished each.

Unit 5 Lessons 3 – Classroom Lesson
One per student

Vocabulary BINGO

Vocabulary BINGO				
		FREE		

Materials
- Article "How the Aeroscraft Works"
- **BLM** Aeroscraft Scale Model
- 4-function calculator

Math Vocabulary
scale factor
similarity
similar
proportion
percent
ratio
interest
tax

Literature Vocabulary
inhabit
vehicle
conventional
luxury
environment
configured
amenities
vertical

Unit 5, Lesson 3 — Grades 7-8

Math Lesson

Math Objectives:
- Solve similarity problems using scale factors and proportional ratios.
- Draw models to represent similar objects.

Language Objectives:
- Discuss problem solving strategies with peers.
- Write out solutions for solving problems.
- Discuss how to set up ratios to find scale factors.
- Explain what a scale factor means.

Building Background
During your measurement activities over the past three lessons, you have been measuring various lengths and comparing the size of the Aeroscraft to the size of jumbo jets now being used. You might not even have been able to find a space large enough to measure a length two football fields long! We're going to scale down the size a bit during this lesson.

Comprehensible Input
First, on pg. 2 of your article from Lesson 3 you will find an Aeroscraft Statistics chart. You will need this chart. Please turn to it now so that it is handy.

The dimensions on this chart give us the outside measures of the Aeroscraft. Any measures used in earlier lessons were inside measures. So we'll see some different measures from what you've worked with in the past.

Using the diagram on pg. 1 of your article and the statistics chart on pg. 2 as guides, we're going sketch the Aeroscraft in the rectangle on your handout.

You'll also need the handout with the grids. The cells in the top rectangle were designed so that each cell = 50 feet. If that is so, how many cells long should we make our drawing if we're using the dimensions on pg. 2 of the article?

We want to know the scale, really. We know that 1 cell = 50 feet
We know the length of the Aeroscraft is 647 feet.

50 feet is to 1 cell as 647 feet is to *x* cells: $\frac{\textbf{50 ft}}{\textbf{1 cell}} = \frac{\textbf{647 ft}}{\textbf{x cells}}$

(Solve: Round 12.94 cells to 13 cells.)

Math Lesson - continued

The middle line on the picture looks like the longest part of the body, so let's draw a 13 grid line that is centered in the rectangle. One way to find the center is to count. Another way is to fold the paper in half *(demonstrate side to side)*, and crease it. Open it, then fold it in half the other way *(demonstrate top to bottom)* and crease it.

Now we have a midpoint from which to draw our line. 13 grids is an odd number, so half of 13 is…..6.5. We need $6\frac{1}{2}$ cells to the left and $6\frac{1}{2}$ cells to the right. Draw your line, please.

Label this line 647 feet. That is the length.

(Repeat the same process for the height. Again, the Aeroscraft looks tallest in the middle, so draw your height line there once you have found the proportion.)

We are not drawing a 3-dimensional representation, so we won't worry about the width.

To sketch the rest of the Aeroscraft, we'll need to analyze the diagram. *(Use the diagram and estimate where the curves on the ends begin. Place marks on the grid so that you can sketch in the rounded tapers. When you have the ellipse drawn, have students estimate the back Empennage and canards.)*

We have drawn an estimated model using a scale factor. At least we used the scale factor for the length and height. What scale factor did we use?

The grids are drawn with half-inch squares. Your grid may have been changed a bit by the duplication process. But, for the purpose of this exercise, let's assume that the grids are made with half-inch squares.

So by what FACTOR did we scale down the huge Aeroscraft? Will it be a whole number scale factor or a fraction scale factor?

A scale factor by a whole number makes things that much LARGER. We made the drawing much smaller. We scaled down by a fractional scale factor.

But what scale factor did we use? To find out, let's set up proportions again. Aren't they handy things to use!

The original is the huge Aeroscraft. Dimensions: $\frac{\textbf{165 ft high}}{\textbf{647 ft long}}$

What are the dimensions of our drawing? Remember that for our purposes, the grids should have measures half-inch by half-inch. So what are the dimensions of our sketch?

$$\frac{\textbf{13 cells long}}{\textbf{3.3 cells wide}} = \frac{\textbf{6.5 inches high}}{\textbf{1.65 inches long}}$$

But we still have a problem because the one measurement is in feet while the other measurement is in inches.

I've asked that you have calculators today because the arithmetic gets a little tedious. So, get out the calculators and let's convert.

How many inches are there in 165 feet?

If you don't automatically know what to do to find out, make a process chart and fill it in until you see the pattern and understand what process to use.

Feet	Process	Inches
1	1 x 12	12
2	2 x 12	24
3	3 x 12	36
n	*n* x 12	12*n*

Multiply the number of feet by 12.

12 x 165 = 1980 inches high
12 x 647 =7764 inches long

If these are proportional ratios, then I should be able to divide the numerator and denominator of the original dimensions by the same number to derive the reduced dimensions ratio. 1980 inches divided by (what) will equal 1.65 inches? …and 7764 inches long divided by (what) equals 6.5 inches long? Let's set it up in equivalent ratios so it looks more familiar. $\frac{\textbf{1980 in. high}}{\textbf{7764 in. long}} = \frac{\textbf{1.65 in. high}}{\textbf{6.5 in. long}}$

We need to find the scale factor, or relationship, that has created such small numbers for our scaled model. All we have to do is find out how many groups of 1.65 inches will make 1980 inches. That number is our scale factor as long as it also works for the denominators.

So, 1980 in. ÷ 1.65 in. = 1194.46. Let's approximate it (instead of round) to 1200 inches. *(verify with denominator)*

	Unit 5, Lesson 3 **Grades 7-8** **Math Lesson** - continued  --- What does (÷ 1200) mean? It means that our original measurements need to be scaled down by a fractional factor of $\frac{1}{1200}$ to produce the model measurements drawn on our grids. It's the SCALE FACTOR! The Follow-up problems will be much simpler. Use the same process and thinking to work your way through them with a partner or group. **MAS Space** Explain the difference in the "math movie" or the action that you see when you read the problems for Rate, measurement division and Rate, partitive division. What are you finding in each? **Objectives:** Read through the math and language objectives, making sure that students understand how they accomplished each.

Unit 5 Lesson 3 – Math Lesson

One per student

Aeroscraft Scale Model

Work with your teacher and class to sketch a scale model drawing of the Aeroscraft. Show math work in the space provided at the bottom of this sheet.

Materials
- **BLM** King of the Mountain-Game Instructions
- King of the Mountain Game Board
- game markers
- dominoes (1 set per pair)
- graph paper
- scratch paper
- **BLM** Recursive Review Problems Lessons 1-3

Math Vocabulary
scale factor
similarity
similar
proportion
percent
ratio
interest
tax

Literature Vocabulary
inhabit
vehicle
conventional
luxury
environment
configured
amenities
vertical

Unit 5, Lesson 3 — Grades 7-8

Follow-up

Math Objectives:
- Solve similarity problems using scale factors and proportional ratios.
- Draw models to represent similar objects.

Language Objectives:
- Discuss problem solving strategies with peers.
- Write out solutions for solving problems.
- Discuss how to set up ratios to find scale factors.
- Explain what a scale factor means.
- Write and explanation of how proportions can help you find scale factors.

Practice and Application
Play the game, King of the Mountain. Game board and instructions can be found in Unit 4, Lesson 2.

QUESTIONS
- How do you know what rectangle to draw?
- What is scale factor?
- How does the scale factor tell you the dimensions of the new shape?
- How does this activity relate to the Math Lesson?

Recursive Review
- Susan's savings account earns 5% interest each month. If she opened the account with $200 on June 1, and did not deposit or withdrawal any money, what was her balance at the end of July?

Writing Topics
Independent Writing Topic
Students will have a daily writing activity which will incorporate the day's focus math vocabulary.

- **How can proportions help you find scale factor?**

Objectives
Review the math and language objectives to make sure that they were accomplished and that the students realize how they were accomplished.

Materials
- 1 large bagel
- 4T cream cheese
- 2 paper dessert plates
- 2 paper towels
- 2 plastic knives

All items listed above per partner pair
- **BLM** Bagels and Cream Cheese-Snack Fractions

Math Objectives
- Use addition, subtraction, multiplication and division to solve problems involving fractions and decimals.
- Convert between fractions, decimals, whole numbers and percents.
- Use division to find unit rates and ratios in proportional relationships such as (speed, density,) price, recipes, and (student-teacher ratios).
- Estimate and find solutions to application problems involving percent.

Language Objectives
- Discuss how ratios and proportions can be used to solve real-world problems.

Math Vocabulary
scale factor
similarity
similar
proportion
percent
ratio
interest
tax

Literature Vocabulary
inhabit
vehicle
conventional
luxury
environment
configured
amenities
vertical

Unit 5, Lesson 3 — Grades 7-8

Snack Fractions

Students should wash their hands before this activity if using food items.

Snack Fractions
Students should have the skills to answer these in small groups. Have the students work through the BLM before sharing the actual snack.

Circulate the room while students are working on the BLM, asking questions as needed to guide, redirect, extend:

QUESTIONS
- What does this ratio mean?
- How did you determine the equivalent ratio?
- Explain how you used ratios in this activity.

Finally, let them share the bagel and cream cheese with a partner.

(*Naturally, if you think the portions suggested in the materials list are too small for a middle schooler's snack, feel free to increase the amounts; make sure, though, that you make the amounts easily divided in halves – they've already done a great deal of work to get the snack.)*

Snack Fraction Journal Writing: Bagel and Cream Cheese Snack Fractions
Explain your strategy for finding the percent increase.

Objectives: Review the objectives with the class, making sure they understand how they achieved each.

Unit 5 Lesson 3 – Snack Fraction

One per student

Bagels and Cream Cheese – Snack Fractions

Work with your partner to solve the problems.

1. Once you have shared your bagels and cream cheese, use pictures, numbers and words to describe how your two shares combine to make 100%.

2. Now, pretend that there were six of you. First, draw a picture of how the snack foods would be shared among you. Then tell what percent of the snack your portion would be. Show your work.

3. What is the percent of increase in your share from one-sixth to one-half?

This portion of the curriculum is NOT required, but should be used to supplement and enrich the Unit's activities.	**Enrichment Suggestions** **Grades 7-8** Unit 5 Aerospace Articles **Math Walk** After Lesson 3 students will have measured out the "floor" of the Aeroscraft. Have them walk the perimeter of the craft. How long does it take them? How far around is the perimeter? After timing the walk, come back inside and determine the approximate perimeter of the Aeroscraft. **Technology Connection** • Fraction, Decimal, Percent practice, including games: http://www.bbc.co.uk/skillswise/numbers/fractiondecimalpercentage/ comparing/comparingall3/index.shtml (repeat) • This math puzzler on multiplication is really fun – try it, it works! http://freakonomics.blogs.nytimes.com/2007/09/05/a-little-math-puzzle-to-ponder/ • Balanced Literacy Ideas: http://t4.jordan.k12.ut.us/cbl/ **More Curriculum Connection Ideas off the Web** • **Social Studies:** What would life be like as a crew member of the Aeroscraft? Read several articles again to see all of the amenities that will be provided. Who are the people who will work on the ship? What are their jobs? How will this be different and like living in a small town? • **Science:** Fascinating middle school lesson(s) on buoyancy based on the Aeroscraft. Select portions of the unit to fit your class needs and time. http://www.coe.berkeley.edu/cues/pep/adept/Particle_Party_Balloons_all.pdf • **Art:** The Aeroscraft will be an innovation in commercial air travel. Thinking about land travel, though, we are still using the same technology of the original automobiles. Have the students design a new land vehicle, one that does not depend on petroleum products, does not look anything like our present land vehicles.

Unit 5 Lesson 3 – Family Fun

Dear _____,

This will be the last Family Fun game I bring home.

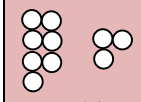
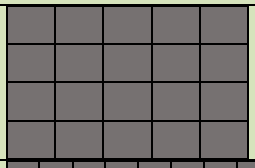
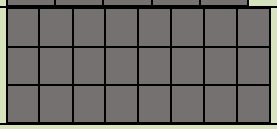
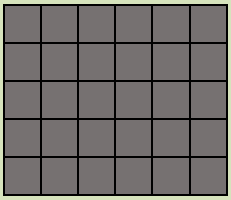
We can enjoy all of our game cards for the rest of the summer. I bet we'll really understand the math concepts when we start school in the Fall!

Here are some strategies I'll need to solve some of the problems in this unit…

_____
_____
_____
_____
_____
_____

Sincerely,

_____

Problem Letter	Kinder	1-2	3-4	5-6	7-8
A	5 baby ducks	23	10	0.5	3 units
B	9 baby ducks	39	6	$8\frac{1}{8}$	1 unit
C	9 baby ducks	70	48	$0.01	2 units
D	3 kernels	37	8 cells	1,111,111,110	50%
E	8 kernels	6	6 bees	54.657 grams salt	50%
F	1 crumb	17	40 plants	11.92% chemical B	75%
G	 10	21		$27.45 tax	20
H		66		$350 tip	32.5
I	Half OR one of 2 equal pieces OR fair shares. (See Kinder Special Instructions for answer to second part.)	$\frac{1}{8}$		$90 interest	18
J	Dime	Cut the cake into 8 shares	5.21	$230 charged	$5.00 earned
K	Penny	Yes. There are 2 equal pieces	5 x 7 = 35 7 x 5 = 35 35 ÷ 7 = 5 35÷ 5 = 7	3 cups cashews	$6.00 earned
L	Nickel	8	xx xx xx xx xx xx	10% tip	$16.74 total bill with tip
M	Quarter	4 + 5 = 9	Eleven and seven hundredths	False. Scale factor not consistent	$3.00 tip
N	Top group	12 – 2 =10	 2/4  4/8	True. Scale factor = (÷4) or (x $\frac{1}{4}$)	$11.10 tip
O	Bottom group	12	0.3	120 cotton balls: 1 bag	$6.97
P	14	9	Line closest to 0	48 babies	$20.00 retail
Q	9	7, 3	Line in the middle	$\frac{12}{12}$ or 1 whole	$22.50 sales price
R	15 beans Card 15	9+ 5 – 14 5 + 9 = 14 14 – 9 = 5 14 – 5 = 9	Between 0.5 and 0.75, closer to 0.75	$2\frac{7}{15}$	$9.00 sales price

Generic Family Fun Game Board

Materials Generic to All Units:

- Game Markers
- Game Cards for your Level
- Answer Key for your Level
- Game Movement Cards (white)
- Unit-specific Materials List

Playing the Game

1. Begin in one of the corner shapes. There may be more than one player in each starting shape. Remember where you started.
2. On your turn, draw one of your level game cards and work the problem.
3. One of the other players uses the Answer Key to check your answer. If correct, draw a movement card and move the given places
   - Forward movement in a clockwise direction.
   - Back movement in a counter clockwise direction.

   If incorrect, do not move.
4. Game is over when the first person runs the entire track, ending back on the starting shape.

Tablero de juego

Materiales genéricos para todas las unidades:

- Fichas para jugar
- Tarjetas del juego para su nivel
- Clave de respuestas para su nivel
- Tarjetas de movimiento del juego (blancas)
- Lista de materiales específicos de la unidad

Cómo se juega

1. Empiece en una de las esquinas. Puede haber más de
1 jugador en cada figura de inicio.
2. Cuando sea su turno, saque una de las tarjetas de
juego de su nivel y resuelva el problema.
3. Uno de los otros jugadores usa la clave de respuestas
para ver si su respuesta es correcta. Si es correcta, saque una tarjeta de movimiento y mueva su ficha como lo indica la tarjeta.
   - Movimiento hacia adelante en el sentido de las manecillas del reloj.
   - Movimiento hacia atrás en el sentido contrario a las manecillas del reloj.

   Si es incorrecta, no se mueve.
4. El juego se acaba cuando la primera persona recorre
toda la pista y termina en la figura de inicio.

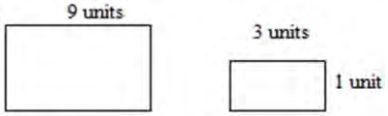
Units 5 Lesson 3 – FAMILY FUN

One per student for home
One per partner pair in class

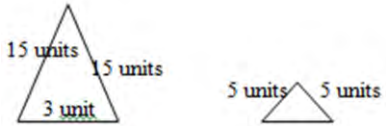
*Print on **goldenrod** paper.*

Family Fun – Problem Cards (1 of 2)

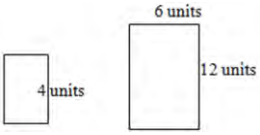
A.
What is the missing measurement?



B.
What is the missing measurement?



C.
What is the missing measurement?



D.
_____% of 90 = 45

E.
_____% of 100 = 50

F.
_____% of 100 = 75

G.
25% of 80 = _____

H.
65% of 50 = _____

I.
20% of 90 = _____

Units 5 Lesson 3 – FAMILY FUN

One per student for home
One per partner pair in class

*Print on **goldenrod** paper.*

Family Fun – Problem Cards (2 of 2)

J. $100 is in the bank. Bank is paying 5% interest. How much is earned in 1 month?	**K**. $150 is in the bank. Bank is paying 4% interest. How much is earned in 1 month?	**L**. The meal cost $13.95. That would be the total bill with a 20% tip?
M. The meal cost $15. That would the waiter receive if a 20% tip was left?	**N**. What would the tip be at 30% on $37.00?	**O**. The car wash cost $9.95. There is a sale for 30% off today only. What would the car wash cost?
P. The dress cost $15.00 on sale. The regular price was discounted 15%. What was the regular price?	**Q.** Seed cost $25 for a 100 pound bag. The store ran a special for 10% off. What was the sales price?	**R.** DVDs were on sale for 10% discount. If the regular price was $10, what was the sales price?

Unit 5 Lesson 3 – FAMILY FUN

Special 7th – 8th Game Instructions

Materials:

- Family Fun Generic Game Board
- Family Fun Movement Cards
- Unit 5 Family Fun Problem Cards for grades 7-8 (green)
- Family Fun Answer Key for Unit 1 (all grade bands)
- Unit 5 Family Fun Special 7th – 8th Game Instructions

Solution Expectations

Problems A – C
This problem set should be solved by finding a scale factor among the given measurements. Numbers are compatible enough for students to use mental math strategies to solve.

Problems D – I
Simple percent problems. Students learned several strategies to solve the problems in this set. Bar modeling and patterns if multiplying and dividing by ten would work great.

Problems J – R
Students have had extensive experience with calculating percents of interest, discounts, and tips. Bar modeling is a preferable strategy for this set, however any strategy is acceptable.

Math Matters 2014 – In-Home Instruction

Math Objectives

Math Lesson 1

- Use ratios to determine rates of travel, distances traveled, and time traveled.

Math Lesson 2

- Use any strategy to solve percent problems including percent discounts, interest, and tips.

Differentiate

Math Lesson 1 – students explore travel distance, travel rate, and travel time in reference to the Aeroscraft.

Math Lesson 2 – students use strategies to solve percent problems including percent discounts, interest, and tips in reference to the cruise ship Queen Mary 2.

Snack Fraction Notice

All snack fractions are common throughout the grade bands. All grade bands have daily snack fraction activities provided. All snack fractions for a unit in a specific grade band will practice the same set of skills. Therefore, you may choose from any of the three activities. Lesson 2, Crackers and Nutella is the simplest snack to transport.

Materials

Math Lesson 1

- **BLM** Aero-Travel

Math Lesson 2

- paper and pencil

Family Fun

- Family Fun Generic Game Board
- Family Fun Movement cards
- Unit 5 Family Fun-Problem Cards
- Family Fun Answer Key from Unit 1 (all grade bands)
- Unit 5 Family Fun Special 7^{th} – 8^{th} Game Instructions
- game markers

Snack Fractions (Math Lesson 2)

- 2 paper dessert plates
- 2 paper towels
- 1 plastic knife
- 4 graham crackers
- 2T Nutella

All items listed above per partner pair

- **BLM** Crackers and Nutella-Snack Fractions ***Allergy Warning – Please substitute a different spread if nut allergies are present.***

QUESTIONING
As a result of this lesson, your students should be able to respond to the following:

- What does it mean to find the "percent of" something?
- How is the strategy in this lesson related to the discount rectangle in previous lessons?
- What data are you trying to find?
- Explain your strategy to me.
- How are calculating percents of discount, interest, and tips related?

Math Vocabulary
scale factor, similarity, similar, proportion, percent, ratio, interest, tax

CGI Problem

- rate, multiplication
- rate, measurement division
- rate, partitive division

Journal Writing
Explain how to find the percent of a quantity and how this relates to solving the various types of discount problems.

Family Fun
A generic game board is being used in all grade levels, differentiated by game cards specific to the grade level.

Snack Fractions
Students divide their snack into halves and sixths, then find the percent of increase in their portion from one to the other.

Assessment
Students will be introduced to and practice skills for all items on the assessment.

Grades 7-8 Overview

Unit 6, Lesson 1 *Bridges! Amazing Structures to Design, Build and Test*

by Carol A. Johmann and Elizabeth J. Rieth

This is a quick snapshot of each of the three math lessons for this unit. For detailed instructions, balanced literacy objectives and enrichment ideas, refer to the complete lesson plans for each lesson.

Lesson Segment	Math Objectives	Language Objectives	Activity	Materials	BLM
Daily Routine 10 - 15 minutes	Post-assess summer skills	Post-assess summer skills	Post-assessment		• post-assessment
Classroom Lesson 30 – 45 minutes	Identify math in everyday situations. Explain and record observations using objects, words, pictures, numbers and technology. Make generalizations from patterns or sets of examples and non-examples. Justify why an answer is reasonable and explain the solution process.	Listen to classmates and to teacher discuss and read. Speak, read and write vocabulary words in context. Brainstorm and discuss the various problems given. Create a chart of sorted items and explain how you decided to sort them. Create a list of things to do before building a skyscraper can begin. Justify your conclusions based on the results of your investigations.	**Vocabulary** Create Frayer model posters for each word. Discuss EiE Engineering Design Process. **Literature** Basics of bridges **Transition to Math** Explore forces on a suspension bridge.	• 7 pieces of large construction paper • EiE Engineering Design Process Posters ordered from http://www.eiestore.com/posters.html • rope strong enough to play "tug-o-war"	
TV Lesson 30 minutes	Identify math in everyday situations. Explain and record observations using objects, words, pictures, numbers and technology. Make generalizations from patterns or sets of examples and non-examples. Justify why an answer is reasonable and explain the solution process.	Listen to classmates and to teacher discuss and read. Speak, read and write vocabulary words in context. Brainstorm and discuss the various problems given. Create a chart of sorted items and explain how you decided to sort them. Create a list of things to do before building a skyscraper can begin. Justify your conclusions based on the results of your investigations.	**Vocabulary** Use literature and math vocabulary pervasively in the lesson. **Comprehensible Input** Demonstrate how students will build the cofferdam.	• pan • sand or dirt • water • Popsicle sticks (at least 30 per group) • masking or painter's tape • plastic wrap • turkey baster (or eye dropper)	• **BLM** Cofferdam Instructions

Follow-up Lesson 2-2.5 hours *(including Snack Fractions)*	Identify math in everyday situations. Explain and record observations using objects, words, pictures, numbers and technology. Make generalizations from patterns or sets of examples and non-examples. Justify why an answer is reasonable and explain the solution process.	Listen to classmates and to teacher discuss and read. Speak, read and write vocabulary words in context. Brainstorm and discuss the various problems given. Create a chart of sorted items and explain how you decided to sort them. Create a list of things to do before building a skyscraper can begin. Justify your conclusions based on the results of your investigations.	**Practice and Application** Students build cofferdams.	• pan • sand or dirt • water • Popsicle sticks (at least 30 per group) • masking or painter's tape • plastic wrap • turkey baster (or eye dropper)	• **BLM** Cofferdam Instructions
Snack Fractions	Use addition, subtraction, multiplication and division to solve problems involving fractions, decimals, ratios, and percents. Convert between fractions, decimals, and percents. Estimate to find solutions to problems involving fractions, decimals, and percents.	Discuss how fractions, decimals, ratios, and percents can be used to solve real-world problems.	Students will work in pairs and explore fraction and decimal concepts through fair-sharing Energy Balls.	• Energy Balls (homemade or store prepared – recipe provided) ***Allergy Warning – please substitute a different mix for the entire class if nut allergies are present.*** • quart sized sandwich bag • 4 paper plates • 4 paper towels • 4 plastic knives *All items listed above per group of four*	

Grades 7-8 Overview

Unit 6, Lesson 2 *Bridges! Amazing Structures to Design, Build and Test*

by Carol A. Johmann and Elizabeth J. Rieth

This is a quick snapshot of each of the three math lessons for this unit. For detailed instructions, balanced literacy objectives and enrichment ideas, refer to the complete lesson plans for each lesson.

Lesson Segment	Math Objectives	Language Objectives	Activity	Materials	BLM
Daily Routine 30 – 45 minutes	Model and solve multistep word problems. Solve problems involving fractions, ratios, and proportions.	Speak to partners, teacher, and class using vocabulary. Discuss problem solving process and strategies.	**Essential:** • Fraction Action • *X* Marks the Spot • CGI **Optional:** Money Matters		• **BLM** Fraction Action and *X* Marks the Spot • **BLM** Lessons 2-3 CGI *Bridges! Amazing Structures to Design, Build and Test*
Classroom Lesson 1 hour – 1.5 hours	Identify math in everyday situations. Explain and record observations using objects, words, pictures, numbers and technology. Make generalizations from patterns or sets of examples and non-examples. Justify why an answer is reasonable and explain the solution process.	Listen to classmates and to teacher discuss and read. Speak, read and write vocabulary words in context. Brainstorm and discuss the various problems given. Create a chart of sorted items and explain how you decided to sort them. Create a list of things to do before building a skyscraper can begin. Justify your conclusions based on the results of your investigations.	**Vocabulary** Review posters and make additions if requested by students. **Literature** Students read about and research famous suspension bridges in the United States. **Transition to Math** Students explore how the forces work on an arch bridge.	• computer with Internet access (1 per class or 1 per pair of students) • printer	• **BLM** My Suspension Bridge Template
TV Lesson 30 minutes	Identify math in everyday situations. Explain and record observations using objects, words, pictures, numbers and technology. Make generalizations from patterns or sets of examples and non-examples. Justify why an answer is reasonable and explain the solution process.	Listen to classmates and to teacher discuss and read. Speak, read and write vocabulary words in context. Brainstorm and discuss the various problems given. Create a chart of sorted items and explain how you decided to sort them. Create a list of things to do before building a skyscraper can begin. Justify your conclusions based	**Vocabulary** Use literature and math vocabulary pervasively in the lesson. **Comprehensible Input** Demonstrate how students will build the suspension bridge.	• 2 kitchen chairs (or any chair that is similar in size and shape) • spool of heavy string • 4 heavy books • masking tape • cardboard (at least 1 ft x 3 ft) • scissors • single hole punch • spool of thread or light	• **BLM** Hang a Suspension Bridge Instructions

		on the results of your investigations.		string • load (of choice – object available in room)	
Follow-up Lesson 30 minutes – 1 hour *(including Snack Fractions)*	Identify math in everyday situations. Explain and record observations using objects, words, pictures, numbers and technology. Make generalizations from patterns or sets of examples and non-examples. Justify why an answer is reasonable and explain the solution process.	Listen to classmates and to teacher discuss and read. Speak, read and write vocabulary words in context. Brainstorm and discuss the various problems given. Create a chart of sorted items and explain how you decided to sort them. Create a list of things to do before building a skyscraper can begin. Justify your conclusions based on the results of your investigations.	**Practice and Application** Students will build a suspension bridge.	• 2 kitchen chairs (or any chair that is similar in size and shape) • spool of heavy string • 4 heavy books • masking tape • cardboard (at least 1 ft x 3 ft) • scissors • single hole punch • spool of thread or light string • load (of choice – object available in room)	• **BLM** Hang a Suspension Bridge Instructions
Snack Fractions	Use addition, subtraction, multiplication and division to solve problems involving fractions, decimals, ratios, and percents. Convert between fractions, decimals, and percents. Estimate to find solutions to problems involving fractions, decimals, and percents.	Discuss how fractions, decimals, ratios, and percents can be used to solve real-world problems.	Students will work in pairs and explore fraction and decimal concepts through fair-sharing a turkey wrap.	• 1 oz turkey • 1 slice Swiss cheese • 1 leaf lettuce • 1 TBS cranberry relish • 1 burrito sized tortilla • 2 paper dessert plates • 2 paper towels • 2 plastic knives *All items listed above per partner pair*	

Grades 7-8 Overview

Unit 6, Lesson 3 *Bridges! Amazing Structures to Design, Build and Test*

by Carol A. Johmann and Elizabeth J. Rieth

This is a quick snapshot of each of the three math lessons for this unit. For detailed instructions, balanced literacy objectives and enrichment ideas, refer to the complete lesson plans for each lesson.

Lesson Segment	Math Objectives	Language Objectives	Activity	Materials	BLM
Daily Routine 30 – 45 minutes	Model and solve multistep word problems. Solve problems involving fractions, ratios, and proportions.	Speak to partners, teacher, and class using vocabulary. Discuss problem solving process and strategies.	**Essential:** • Fraction Action • *X* Marks the Spot • CGI **Optional:** Money Matters		• **BLM** Fraction Action and *X* Marks the Spot • **BLM** Lessons 2-3 CGI *Bridges! Amazing Structures to Design, Build and Test*
Classroom Lesson 1 hour – 1.5 hours	Identify math in everyday situations. Explain and record observations using objects, words, pictures, numbers and technology. Make generalizations from patterns or sets of examples and non-examples. Justify why an answer is reasonable and explain the solution process.	Listen to classmates and to teacher discuss and read. Speak, read and write vocabulary words in context. Brainstorm and discuss the various problems given. Create a chart of sorted items and explain how you decided to sort them. Create a list of things to do before building a skyscraper can begin. Justify your conclusions based on the results of your investigations.	**Vocabulary** Review posters and make additions if requested by students. **Literature** Students read about and research famous bridges that move/lift globally. **Transition to Math** Students explore how to balance like a bridge.	• computer with Internet access (1 per class or 1 per pair of students) • printer	• **BLM** My Bridge that Lifts Template
TV Lesson 30 minutes	Identify math in everyday situations. Explain and record observations using objects, words, pictures, numbers and technology. Make generalizations from patterns or sets of examples and non-examples. Justify why an answer is reasonable and explain the solution process.	Listen to classmates and to teacher discuss and read. Speak, read and write vocabulary words in context. Brainstorm and discuss the various problems given. Create a chart of sorted items and explain how you decided to sort them. Create a list of things to do before building a skyscraper can begin. Justify your conclusions based	**Vocabulary** Use literature and math vocabulary pervasively in the lesson. **Comprehensible Input** Demonstrate how students will build a bridge that moves.	• hole punch • scissors • string • 2 empty cereal boxes • 1 piece of thin cardboard (about the size of the boxes) • drinking straw cut in half	• **BLM** Lift That Bridge! Instructions

		on the results of your investigations.			
Follow-up Lesson 30 minutes – 1 hour *(including Snack Fractions)*	Identify math in everyday situations. Explain and record observations using objects, words, pictures, numbers and technology. Make generalizations from patterns or sets of examples and non-examples. Justify why an answer is reasonable and explain the solution process.	Listen to classmates and to teacher discuss and read. Speak, read and write vocabulary words in context. Brainstorm and discuss the various problems given. Create a chart of sorted items and explain how you decided to sort them. Create a list of things to do before building a skyscraper can begin. Justify your conclusions based on the results of your investigations.	**Practice and Application** Students build a bridge that moves.	• hole punch • scissors • string • 2 empty cereal boxes • 1 piece of thin cardboard (about the size of the boxes) • drinking straw cut in half	• **BLM** Lift That Bridge! Instructions
Snack Fractions	Use addition, subtraction, multiplication and division to solve problems involving fractions, decimals, ratios, and percents. Convert between fractions, decimals, and percents. Estimate to find solutions to problems involving fractions, decimals, and percents.	Discuss how fractions, decimals, ratios, and percents can be used to solve real-world problems.	Students will work in pairs and explore fraction and decimal concepts through fair-sharing a veggie pizza.	• 1 personal pan pizza • 2 individual servings of juice • 2 paper dessert plates • 2 paper towels • 2 plastic knives *All items listed above per partner pair*	

Project SMART/ Math MATTERS 2014

Grade Level: 7-8	Unit 6 / Lessons 1 – 2 – 3

Daily Routine Math Objectives:
Model and solve multistep word problems.
Solve problems involving fractions, ratios, and proportions.
Solve for a variable.

Daily Routine Language Objectives:
Speak to partners, teacher, and class using vocabulary.
Discuss problem solving process and strategies.

Unit Math Objectives:
Identify math in everyday situations.
Explain and record observations using objects, words, pictures, numbers and technology.
Make generalizations from patterns or sets of examples and non-examples.
Justify why an answer is reasonable and explain the solution process.

Unit Language Objectives:
Listen to classmates and to teacher discuss and read.
Speak, read and write vocabulary words in context.
Brainstorm and discuss the various problems given.
Create a chart of sorted items and explain how you decided to sort them.
Create a list of things to do before building a skyscraper can begin.
Justify your conclusions based on the results of your investigations.

Unit Science Objectives:
Demonstrate safe practices and the use of safety equipment as needed during investigations.
Plan and implement descriptive investigations, including asking well-defined questions, making inferences, and selecting and using appropriate equipment or technology to answer the questions.
Collect and record data by observing and measuring, using descriptive words and numerals such as labeled drawing, writing, and concept maps
Analyze data and interpret patterns to construct reasonable explanations from data that can be observed and measured.
Communicate valid, oral and written results supported by data.
Brainstorm and discuss the various problems given.
Generate charts to describe the outcomes of investigations.

Technology Objectives:
Use research skills and electronic communication, with appropriate supervision, to create new knowledge.

Vocabulary
Math and Language: technology, engineer, architect, scientist, environmentalist, load, dam, suspension

Resources/Literacy Links
Bridges! Amazing Structures to Design, Build, and Test
by Carol A. Johmann and Elizabeth J. Rieth

Lesson Sequence – *Note the suggested time differences. Adjustments were made to accommodate the STEM Projects. Please modify to meet the needs of your students.*

- Daily Routine: 10 – 15 minutes
- Classroom Lesson: 30 – 45 minutes
- Math Lesson: 30 minutes
- Follow-up including Snack Fractions: 2 – 2.5 hours

Unit 6 CGI Problems for *Bridges!*

	Multiplication	Measurement Division	Partitive Division
Grouping and Partitioning	Pile it on! Our class made some different kinds of bridges. We tested them by seeing how many paper clips they could hold. If there are ___ students in our class and each student used an average of ___ clips, how many clips did we use in all? 12, 12 15, 15 23, 19	Pile it on! Our class made some different kinds of bridges. We tested them by seeing how many paper clips they could hold. The class used a total of ___ paper clips with each person using an average of ___ clips. How many students were in the class? 360, 18 408, 34 154, 14	Pile it on! Our class made some different kinds of bridges. We tested them by seeing how many paper clips they could hold. The class used a total of ___ clips. If there are ___ students in the class, how many clips did each student use? 135, 9 234, 13 336, 16
Rate	The Wonder Bridge in London opens about 500 times per year to let sailing vessels go through. How many times has the bridge raised over the past ___ years? 10 15 25	During one period of time, a total of 162,414 cars crossed the San Francisco Bridge. If 6767.25 cars crossed per hour, how many hours did it take for the 162,414 cars to cross?	The Wonder Bridge in London opens 500 times per year to let sailing vessels go through. There are 365 days in a year. How many times on average does it raise per day?
Price	With the opening of the Confederation Bridge between New Brunswick and Prince Edward Island, people can now cross the strait in 10 minutes for $35. If an average of ___ cars cross the bridge each day, how much money is collected each day? 56 75 123	With the opening of the Confederation Bridge between New Brunswick and Prince Edward Island, people can now cross the strait in 10 minutes. If ___ was collected in one day and it cost each car $35, how many cars crossed the bridge? $2,030 $3,570 $5,810	Building a new bridge costs a lot of money! If the total cost of a bridge is $104,000 and the bridge is 650 square feet, how much does it cost to build a bridge per square foot?
Fractions	An I-Beam used in bridge building could weigh 3/4 ton for a 20 foot beam. How many tons would 250 beams weigh? How many pounds would that be?	One bridge spans a total of 183.75 feet. Each truss takes up 12.25 feet. How many trusses are there?	You want to build a bridge over the creek. The span is 21 ¼ feet. If you used 42 ½ planks set side-by-side, how wide was each plank?
Multiplicative Comparison	The Golden Gate bridge is 2.5 times longer than the Brooklyn Bridge. The Brooklyn bridge is 1600 feet long. How long is the Golden Gate Bridge?	Bridge maintenance and repairs are expensive! By one estimate, by paying a crew $125,000 a year to maintain a bridge, $375,000 in repairs later on could be avoided. How many times more expensive is it to repair rather than maintain a bridge?	In the olden days, the Wonder Bridge raised 6000 times per year to allow sailing vessels through. That was 12 times more than the times it raises per year now. How many times per year does the Wonder Bridge raise nowadays?

Unit 6 *CGI* Problems for *Bridges!*

Formación de grupos y Partición	¡Apílalo! Nuestra clase hizo algunos tipos de puentes distintos. Los probamos viendo cuántos clips de papel podrían sostener. Si hay ___ estudiantes en nuestra clase y cada estudiante usaba en promedio ___ clips, ¿cuántos clips usamos al final? 12, 12 15, 15 23, 19	¡Apílalo! Nuestra clase hizo algunos tipos de puentes distintos. Los probamos viendo cuántos clips de papel podrían sostener. La clase usó en total ___ clips para papel con cada persona utilizando un promedio de ___ clips. ¿Cuántos estudiantes había en la clase? 360, 18 408, 34 154, 14	¡Apílalo! Nuestra clase hizo algunos tipos de puentes distintos. Los probamos viendo cuántos clips de papel podrían sostener. La clase usó en total ___ clips. Si hay ___ estudiantes en nuestra clase, ¿cuántos clips usó cada estudiante? 135, 9 234, 13 336, 16
Velocidad	El Wonder Bridge en Londres abre unas 500 veces al año para dejar que los barcos pasen navegando a través de él. ¿Cuántas veces se ha levantado el puente en los últimos ___ años? 10 15 25	Durante un período de tiempo, un total de 162,414 autos cruzó el Puente San Francisco. Si 6767.25 autos cruzaron por hora, ¿cuántas horas se necesitaron para que cruzaran 162,414 autos?	El Wonder Bridge en Londres abre unas 500 veces al año para dejar que los barcos pasen navegando a través de él. El año tiene 365 días. ¿Cuántas veces en promedio se levanta al día?
Precio	Con la apertura del Confederation Bridge entre New Brunswick y Prince Edward Island, ahora la gente puede cruzar el tramo en 10 minutos por $35. Si un promedio de ___ autos cruza el puente cada día, ¿cuánto dinero se recauda cada día? 56 75 123	Con la apertura del Confederation Bridge entre New Brunswick y Prince Edward Island, ahora la gente puede cruzar el tramo en 10 minutos. Si se recaudó ___ en un día y a cada auto le cuesta $35 pasar, ¿cuántos autos cruzaron el puente? $2,030 $3,570 $5,810	¡Construir un puente nuevo cuesta mucho dinero! Si el costo total de un puente es $104,000 y el puente tiene 650 pies cuadrados, ¿cuánto cuesta construir un puente por pie cuadrado?
Fracciones	Una Viga en I que se usa en la construcción de un puente puede pesar 3/4 de tonelada para una viga de de 20 pies. ¿Cuántas toneladas pesarían 250 vigas? ¿Cuánto sería eso en libras?	Un puente abarca un total de 183.75 pies. Cada cercha abarca 12.25 pies. ¿Cuántas cerchas hay?	Quieres construir un puente sobre el arroyo. La distancia a cubrir es de 21 ¼ pies. Si usaste 42 ½ tablones puestos lado a lado, ¿qué ancho tiene cada tablón?
Comparación multiplicativa	El puente Golden Gate es 2.5 veces más largo que el puente de Brooklyn. El puente de Brooklyn tiene 1600 pies de largo. ¿Qué largo tiene el Puente Golden Gate?	¡Los trabajos de mantenimiento y reparación de un puente son caros! Una cotización señala que si se paga a una cuadrilla $125,000 al año para mantener un puente, se podría ahorrar el pago de $375,000 en reparaciones. ¿Cuántas veces más caro es reparar que mantener un puente?	Antiguamente, el Wonder Bridge en Londres se levantaba 6000 veces al año para dejar que los barcos pasen navegando a través de él. Era 12 veces más que las que se levanta ahora al año. ¿Cuántas veces al año se levanta el Wonder Bridge hoy en día?

Materials
- post-assessment

Math Objectives
- post-assess summer skills

Language Objectives
- post-assess summer skills

Math and Literature Vocabulary
technology
engineer
architect
environmentalist
load
dam
suspension

Assessed TEKS for this Unit
7th – 71.b,72.a,7.3a,7.4b
8th – 8.5a,8.5e

Unit 6, Lesson 1 — Grades 7-8

Daily Routine

The following daily activities will help prepare your students for the Post-assessment. They are not optional.

ESSENTIAL

Measurement Lab
omitted

Solve It! Multi-step problem solving
omitted

Fraction Action
- **Lesson 1 – *omitted***
- Lesson 2 – (5th assessment item 1,2,3)
- Lesson 3 – (5th assessment item 6)

***X* Marks the Spot**
- **Lesson 1 – *omitted***
- Lesson 2 – (6th assessment item 2)
- Lesson 3 – (6th assessment item 8)

CGI
- **Lesson 1 – omitted**
- Lesson 2 – Compare Referent Unknown (5th assessment item 5)
- Lesson 3 – Price Partitive Division (6th assessment item 6)

The following activities, although certainly developmentally appropriate for your 7th and 8th grade students, do not specifically address objectives assessed on the Post-assessment. Schools with shorter teaching spans can consider omitting some or all these activities as your time permits.

OPTIONAL

Target Number
omitted

Money Matters
(*If you have a full program and wish to use this optional activity, you will find BLMs and Explanations in the Optional Activities Tab of your Teacher's Guide*.)

Materials
- 7 pieces of large construction paper
- EiE Engineering Design Process Posters ordered from http://www.eiestore.com/posters.html
- rope strong enough to play "tug-o-war"

Literature Selection
Bridges! Amazing Structures to Design, Build, and Test
by Carol A. Johmann and Elizabeth J. Rieth
p. 4-10 and p. 16-19

Math and Literature Vocabulary
technology
engineer
architect
environmentalist
load
dam
suspension

Unit 6, Lesson 1 — Grades 7-8

Classroom Lesson

Every day teachers must post the objectives on the board, read them to the students, and have students read them together with the teacher. At the end of the lesson, teacher and students should review to see if they have accomplished both math and language objectives.

Math Objectives:
- Identify math in everyday situations.
- Explain and record observations using objects, words, pictures, numbers and technology.
- Make generalizations from patterns or sets of examples and non-examples.
- Justify why an answer is reasonable and explain the solution process.

Language Objectives:
- Listen to classmates and to teacher discuss and read.
- Speak, read and write vocabulary words in context.
- Brainstorm and discuss the various problems given.
- Create a chart of sorted items and explain how you decided to sort them.
- Create a list of things to do before building a skyscraper can begin.
- Justify your conclusions based on the results of your investigations.

Science Objectives:
- Demonstrate safe practices and the use of safety equipment as needed during investigations.
- Plan and implement descriptive investigations, including asking well-defined questions, making inferences, and selecting and using appropriate equipment or technology to answer the questions.
- Collect and record data by observing and measure, using descriptive words and numerals such as labeled drawing, writing, and concept maps.
- Analyze data and interpret patterns to construct reasonable explanations from data that can be observed and measured.
- Communicate valid, oral and written results supported by data.
- Brainstorm and discuss the various problems given.
- Generate charts to describe the outcomes of investigations.

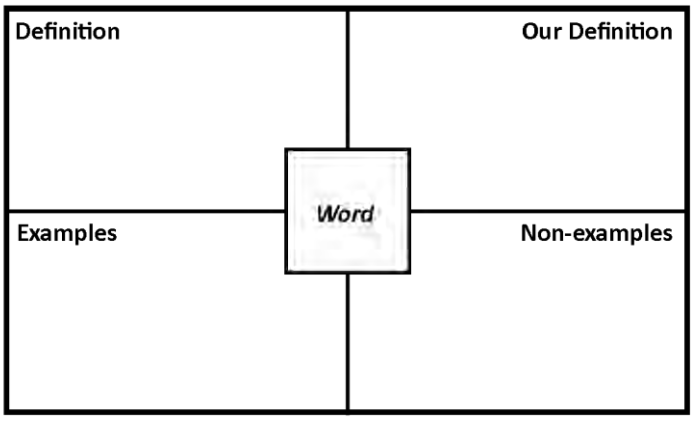
Classroom Lesson - continued

Building Background

Students will create Frayer Models for the vocabulary words in this unit. The examples and non-examples must be relatable to the actual vocabulary word. For instance, a purple elephant is a non-example of "perimeter." However, the purple elephant does not help us understand what perimeter actually is. A more appropriate non-example could be the tiles on the kitchen floor. That is an example for "area;" a common misconception for students.

Comprehensible Input

Use the large construction paper to create the Frayer model posters. Each poster should be divided into the sections shown in the diagram below.



Sections:

1. Word – vocabulary word is written in the middle
2. Definition – "text book" definition, formal
3. Our Definition – definition in "your own words," still accurate
4. Examples – pictures or words explaining what IT IS
5. Non-examples – pictures or words explaining what IT IS NOT

Complete for each vocabulary word.

Building Background - Literature

Remind returning students (8th graders) that they built bridges from this book during the previous summer program. This year is an extension from those projects. The concepts will be reviewed in the beginning for new students.

Introduce the EiE Engineering Design Process Posters one-by-one and discuss what each step means. Explain that the process does not necessarily have a start and finish where each step is done in sequence. They will move through the steps in the process fluidly and may need to jump from one to another. Shown in Figure 1.

Figure 1

Unit 6, Lesson 1 — Grades 7-8

Classroom Lesson - continued

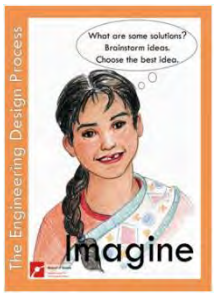
Design Process

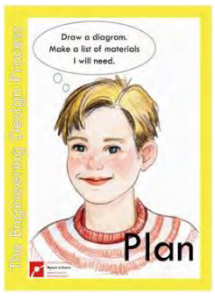
Ask -	What is the problem? What have others done already? What are my constraints?
Imagine -	What are some solutions? Brainstorm ideas. Choose the best idea.
Plan -	Draw a diagram. Make a list of materials we will need.
Create -	Follow the plan. Build the design. Test it out.
Improve -	How can we make the design better? Try again?

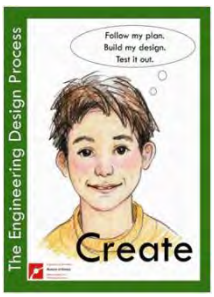
Comprehensible Input - Literature
Read pgs. 4-10 in the literature selection stopping to discuss the questions on pg. 6 with students. Additional questions to discuss could be:

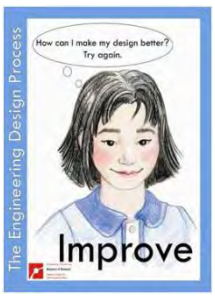
- Why does that bridge building job appeal to you?
- What skills do you already possess that will help you with that job?
- Are there any other bridge building jobs you might like to try?

After discussing the many jobs that are needed when building a structure of this magnitude, read pgs. 17-19. Tell students they will practice how forces work on bridges during the Transition to Math lessons during this unit.









	Unit 6, Lesson 1 **Grades 7-8** **Classroom Lesson** - continued  **----------** **Transition to Math** Read pgs. 12-13 and perform the activity, Be a Suspension Bridge Cable. Divide the class into two teams *(do not have to be exact)* and explain that they are NOT playing tug-o-war to make the other team fall down. The goal is to pull as hard as your team can pull WITHOUT making the other team fall. Repeat the activity with different teams (*boys vs. girls, girls vs. girls, boys vs. boys, teacher vs. class, few students vs many, etc.)*. Discuss the observations made by the teams after each trial. • Did you have to pull hard or ease up? Why? • Was it difficult to keep everyone in balance? Why or why not? • Could you feel the tension? • Could you feel the push and pull? • What was your strategy to keep the other team from falling? Explain to students that they will watch the TV Teacher demonstrate how to perform the bridge project for Follow-up Lesson 1. **Objectives** Read through the math and language objectives, making sure that students understand how they accomplished each.

Unit 6 Lesson 1 – Classroom Lesson

Duplicate on cardstock and cut apart for word cards.

technology

engineer

architect

environmentalist

Duplicate on cardstock and cut apart for word cards.

load

force

dam

suspension

Duplicate on cardstock and cut apart for word cards.

technología
ingeniero
arquitecto
ambientalista

carga

fuerza

presa

suspensión

Materials
- pan
- sand or dirt
- water
- Popsicle sticks (at least 30 per group)
- masking or painter's tape
- plastic wrap
- turkey baster (or eye dropper)
- **BLM** Cofferdam Instructions

Math and Literature Vocabulary
technology
engineer
architect
environmentalist
load
dam
suspension

Teacher Note
2012-2013 Math Matters Program STEM Projects
- Pile It On (pgs. 20-21)
- Making Concrete (pgs. 26-28)
- Flood Control (pg. 34)
- Build an Amazing Truss Bridge (pgs. 41-42)

Unit 6, Lesson 1 — Grades 7-8

TV Lesson

Math Objectives:
- Identify math in everyday situations.
- Explain and record observations using objects, words, pictures, numbers and technology.
- Make generalizations from patterns or sets of examples and non-examples.
- Justify why an answer is reasonable and explain the solution process.

Language Objectives:
- Listen to classmates and to teacher discuss and read.
- Speak, read and write vocabulary words in context.
- Brainstorm and discuss the various problems given.
- Create a chart of sorted items and explain how you decided to sort them.
- Create a list of things to do before building a skyscraper can begin.
- Justify your conclusions based on the results of your investigations.

Science Objectives:
- Demonstrate safe practices and the use of safety equipment as needed during investigations.
- Plan and implement descriptive investigations, including asking well-defined questions, making inferences, and selecting and using appropriate equipment or technology to answer the questions.
- Collect and record data by observing and measuring, using descriptive words and numerals such as labeled drawing, writing, and concept maps.
- Analyze data and interpret patterns to construct reasonable explanations from data that can be observed and measured.
- Communicate valid, oral and written results supported by data
- Brainstorm and discuss the various problems given.
- Generate charts to describe the outcomes of investigations.

Building Background
Students read through the basics of different bridges during the Classroom Lesson and practice how forces work on a suspension bridge during Transition to Math.

The 2013 summer program projects are listed in the sidebar. Please feel free to integrate or supplement the previously mentioned projects into the curriculum should your class have minimal or no experience with them. Please refer to the literature selection for materials lists and procedures.

Teacher Note
Captain Portio will introduce more basic information about cofferdams.
http://en.wikipedia.org/wiki/Cofferdam

"A **cofferdam** (also called a **coffer**[1]) is a temporary enclosure built within, or in pairs across, a body of water and constructed to allow the enclosed area to be pumped out, creating a dry work environment for the major work to proceed. Enclosed coffers are commonly used for construction and repair of oil platforms, bridge piers and other support structures built within or over water. These cofferdams are usually welded steel structures, with components consisting of sheet piles, wales, and cross braces. Such structures are typically dismantled after the ultimate work is completed."

Unit 6, Lesson 1 — Grades 7-8

TV Lesson - continued

Comprehensible Input
Review the Engineering Design Process posters.

Students will build a cofferdam during Follow-up Lesson 1. Read the introduction to cofferdams on pg. 29 of the literature selection.

Building the Cofferdam (taken directly from *Bridges!* p. 29)

1) Fill the pan halfway with sand or dirt. Add water about an inch *(2.5 cm)* above that.
2) Use a third of the Popsicle sticks to make the inside ring of the dam. Push each stick through the sand to the bottom of the pan. The sticks should tough each other and be higher than the water.
3) Run a piece of tape along the top of the ring on the inside. Put a second ring around the first using the rest of the Popsicle sticks, leaving about a half-inch *(1 cm)* space between. Tape along the outside of the second ring.
4) Twist a piece of plastic wrap and snake it around the space, stuffing it down as you go until you fill the space higher than the water. Fix the sticks if they moved.
5) Remove the water inside the inner ring with the baster.

Pirate's Corner
Upload pictures of your cofferdams to MAS Space and share your experiences! Was it hard? Easy? Were you able to get the bottom completely dry? Did you run into any struggles? Did you have to make adjustments to your design?

Objectives
Read through the math and language objectives, making sure that students understand how they accomplished each.

Unit 6 Lesson 1 – TV Lesson and Follow-up

One per group

Cofferdam - Instructions

Materials:

- pan
- sand or dirt
- water
- Popsicle sticks (at least 30)
- masking or painter's tape
- plastic wrap
- turkey baster (or eye dropper)

Instructions:

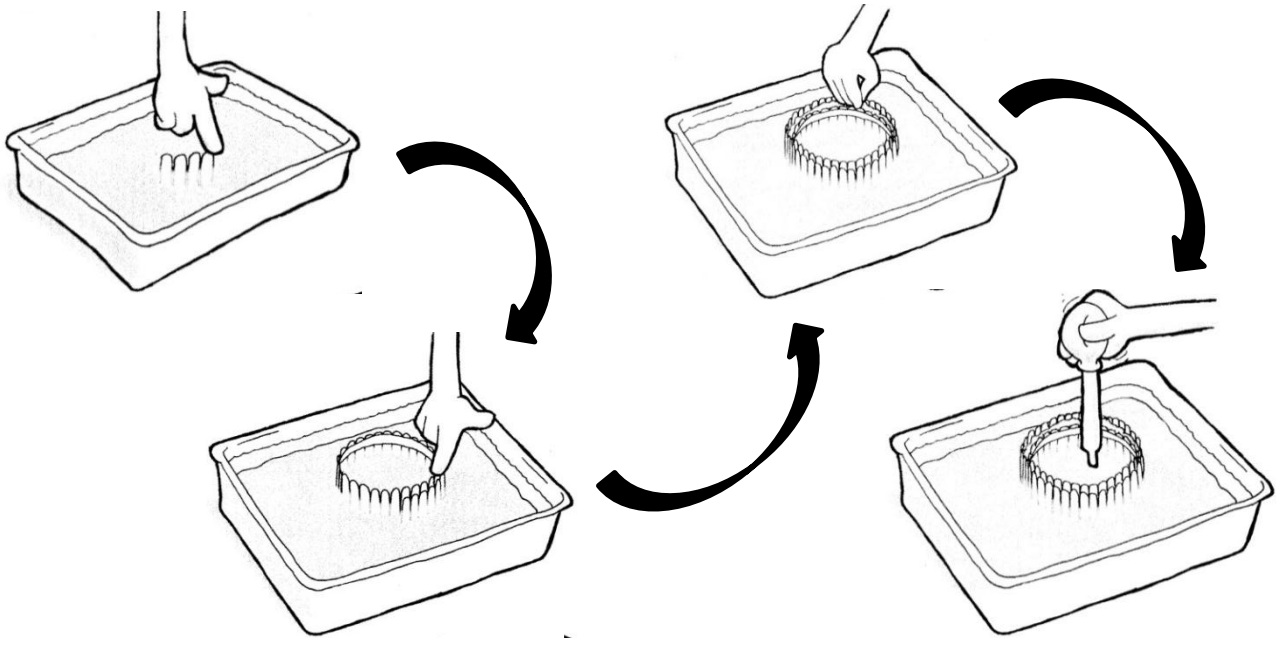
1) Fill the pan halfway with sand or dirt. Add water about an inch (2.5 cm) above that.

2) Use a third of the Popsicle sticks to make the inside ring of the dam. Push each stick through the sand to the bottom of the pan. The sticks should touch each other and be higher than the water.

3) Run a piece of tape along the top of the ring on the inside. Put a second ring around the first using the rest of the Popsicle sticks, leaving about a half-inch (1 cm) space between. Tape along the outside of the second ring.

4) Twist a piece of plastic wrap and snake it around the space, stuffing it down as you go until you fill the space higher than the water. Fix the sticks if they moved.

5) Remove the water inside the inner ring with the baster.



**images used from Bridges! Amazing Structures to Design, Build and Test pgs.29-30*

Materials
- pan
- sand or dirt
- water
- Popsicle sticks (at least 30 per group)
- masking or painter's tape
- plastic wrap
- turkey baster (or eye dropper)

BLM Cofferdam Instructions

Math and Literature Vocabulary
technology
engineer
architect
environmentalist
load
dam
suspension

Unit 6, Lesson 1 — Grades 7-8

Follow-up

Math Objectives:
- Identify math in everyday situations.
- Explain and record observations using objects, words, pictures, numbers and technology.
- Make generalizations from patterns or sets of examples and non-examples.
- Justify why an answer is reasonable and explain the solution process.

Language Objectives:
- Listen to classmates and to teacher discuss and read.
- Speak, read and write vocabulary words in context.
- Brainstorm and discuss the various problems given.
- Create a chart of sorted items and explain how you decided to sort them.
- Create a list of things to do before building a skyscraper can begin.
- Justify your conclusions based on the results of your investigations.

Science Objectives:
- Demonstrate safe practices and the use of safety equipment as needed during investigations.
- Plan and implement descriptive investigations, including asking well-defined questions, making inferences, and selecting and using appropriate equipment or technology to answer the questions.
- Collect and record data by observing and measuring, using descriptive words and numerals such as labeled drawing, writing, and concept maps.
- Analyze data and interpret patterns to construct reasonable explanations from data that can be observed and measured.
- Communicate valid, oral and written results supported by data.
- Brainstorm and discuss the various problems given.
- Generate charts to describe the outcomes of investigations.

Practice and Application
Divide class into groups of three-four and distribute materials. Review the activity again making sure to address any questions or concerns.

Students will follow the directions provided on BLM Cofferdam - Instructions.

Document the process by taking pictures of student groups working on the project.

Follow-up - continued

Monitor student groups, stopping to ask thought provoking questions.

QUESTIONS

- What do you predict will happen if there are gaps in the Popsicle sticks?
- How is your design working?
- Do you need to make any adjustments?
- Is there a leak? If so, how do you think you can fix it?
- What steps of the design process have you gone through?
- What step of the design process are you on right now?
- Can you think of other ways the concept of the cofferdam could be used in real life?

Take pictures of the final products built by the students.

Recursive Review
omitted

Writing Topics
Independent Writing Topic
omitted

Objectives
Read through the math and language objectives, making sure that students understand how they accomplished each.

Materials

- Energy Balls (homemade or store prepared – recipe provided)

Allergy Warning – please substitute a different mix for the entire class if nut allergies are present.

- quart sized sandwich bag
- 4 paper plates
- 4 paper towels
- 4 plastic knives

All items listed above per group of four

Math and Literature Vocabulary

technology
engineer
architect
environmentalist
load
dam
suspension

Unit 6, Lesson 1 — Grades 7-8

Snack Fractions

Students should wash their hands before this activity if using food items.

Math Objectives

- Use addition, subtraction, multiplication and division to solve problems involving fractions, decimals, ratios, and percents.
- Convert between fractions, decimals, and percents.
- Estimate to find solutions to problems involving fractions, decimals, and percents.

Language Objectives

- Discuss how fractions, decimals, ratios, and percents can be used to solve real-world problems.

Snack Fractions

Snack Fractions will be simple during this unit because of the extensive project design in the main lesson pieces. Students simply share and answer orally administered questions *(examples provided)*.

The Snack Fraction activities for this lesson will focus on combining and separating fractional parts as well as dividing into eighths. Teacher will facilitate mathematical conversations during this lesson instead of providing a record sheet to students.

Energy Balls Recipe:

- 1 cup choc chips
- ½ c oatmeal
- ½ c crunchy peanut butter
- ½ c nuts or sunflower seeds
- 1 T honey
- Wheat germ (optional)

Prior to lesson, mix all ingredients and store in sandwich baggies *(1 per group of 4)*. Students will divide the mixture between four people in their group. But each person needs to receive two energy balls. Once snack is divided equally, students form their portion into two small balls and roll in the wheat germ.

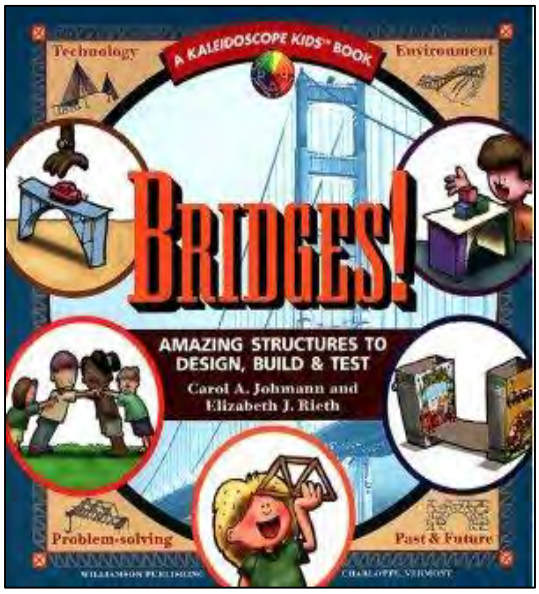
QUESTIONS

- How do I break this up into equal shares?
- What does that fraction represent?
- Does this fraction have an easily calculated decimal equivalent?
- How can you find the decimal of this fraction?
- How did you calculate the percent?
- What is the fractional representation of your share and one more friend combined? Two more friends?

	Unit 6, Lesson 1 **Grades 7-8** **Snack Fractions -** continued  --- Once the activity is complete, let them enjoy their snack! **Snack Fraction Journal Writing: BLM Energy Balls-Snack Fractions** *omitted* **Objectives** Read through the math and language objectives, making sure that students understand how they accomplished each.

Unit 6 Lesson 1 – Family Fun

Dear _____,



We read ***Bridges! Amazing Structures to Design, Build and Test***
by Carol A. Johmann and Elizabeth J Rieth.

The structure we designed and built today was a…

_____

It is used when…

_____

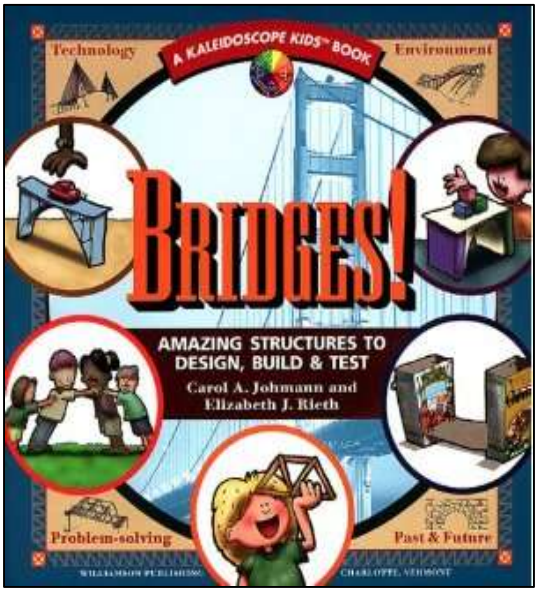
_____

Sincerely,

_____

Unit 6 Lesson 1 – Family Fun

Dear _____,



Leímos ***Bridges! Amazing Structures to Design, Build and Test*** *por* Carol A. Johmann y Elizabeth J Rieth.

La estructura que diseñamos y construímos hoy fue…

_____

Se usa cuando…

_____

_____

Atentamente,

_____

Materials
- **BLM** Fraction Action and *X* Marks the Spot
- **BLM** Lessons 2-3 CGI *Bridges! Amazing Structures to Design, Build and Test*

Math Objectives
- Model and solve multistep word problems.
- Solve problems involving fractions, ratios, and proportions.

Language Objectives
- Speak to partners, teacher, and class using vocabulary.
- Discuss problem solving process and strategies.

Math and Literature Vocabulary
technology
engineer
architect
environmentalist
load
dam
suspension

Assessed TEKS for this Unit
5th – 5.3H, 5.3K
6th – 6.4C, 6.4D, 6.4E, 6.5B, 6.5C

Unit 6, Lesson 2 — Grades 7-8

Daily Routine

The following daily activities will help prepare your students for the Post-assessment. They are not optional.

ESSENTIAL

Measurement Lab
omitted

Solve It! Multi-step problem solving
omitted

Fraction Action
- Lesson 1 – *omitted*
- **Lesson 2 – (5th assessment item 1,2,3)**
- Lesson 3 – (5th assessment item 6) *mixed

***X* Marks the Spot**
- Lesson 1 – *omitted*
- **Lesson 2 – (6th assessment item 2)**
- Lesson 3 – (6th assessment item 8) *tip

CGI
- Lesson 1 – omitted
- **Lesson 2 – Compare Referent Unknown (5th assessment item 5)**
- Lesson 3 – Price Partitive Division (6th assessment item 6)

The following activities, although certainly developmentally appropriate for your 7th and 8th grade students, do not specifically address objectives assessed on the Post-assessment. Schools with shorter teaching spans can consider omitting some or all these activities as your time permits.

OPTIONAL

Target Number
omitted

Money Matters
(*If you have a full program and wish to use this optional activity, you will find BLMs and Explanations in the Optional Activities Tab of your Teacher's Guide*.)

Unit 6 Lesson 2 – Daily Routines – Fraction Action and *X* Marks the Spot

One per student

Fraction Action

$$3\frac{1}{2} - \frac{3}{8} = ?$$

X Marks the Spot

Solve for x (approximate answer may be given in fraction or decimal form)

$$33\frac{1}{3}\% \text{ of } 1 = x$$

Materials
- computer with Internet access (1 per class or 1 per pair of students)
- printer
- **BLM** My Suspension Bridge Template

Literature Selection
Bridges! Amazing Structures to Design, Build, and Test
by Carol A. Johmann and Elizabeth J. Rieth
p. 52, p. 54-56, and p. 58-59

Math and Literature Vocabulary
technology
engineer
architect
environmentalist
load
dam
suspension

Unit 6, Lesson 2 — Grades 7-8

Classroom Lesson

Every day teachers must post the objectives on the board, read them to the students, and have students read them together with the teacher. At the end of the lesson, teacher and students should review to see if they have accomplished both math and language objectives.

Math Objectives:
- Identify math in everyday situations.
- Explain and record observations using objects, words, pictures, numbers and technology.
- Make generalizations from patterns or sets of examples and non-examples.
- Justify why an answer is reasonable and explain the solution process.

Language Objectives:
- Listen to classmates and to teacher discuss and read.
- Speak, read and write vocabulary words in context.
- Brainstorm and discuss the various problems given.
- Create a chart of sorted items and explain how you decided to sort them.
- Create a list of things to do before building a skyscraper can begin.
- Justify your conclusions based on the results of your investigations.

Science Objectives:
- Demonstrate safe practices and the use of safety equipment as needed during investigations.
- Plan and implement descriptive investigations, including asking well-defined questions, making inferences, and selecting and using appropriate equipment or technology to answer the questions.
- Collect and record data by observing and measuring, using descriptive words and numerals such as labeled drawing, writing, and concept maps.
- Analyze data and interpret patterns to construct reasonable explanations from data that can be observed and measured.
- Communicate valid, oral and written results supported by data.
- Brainstorm and discuss the various problems given.
- Generate charts to describe the outcomes of investigations.

Building Background
Review Frayer model vocabulary posters created in Lesson 1. Make any additions to the examples and non-examples if suggested by students.

Building Background - Literature
Transition to Math Lesson 1 activity allowed students to explore the forces on a suspension bridge using rope and their bodies. Today they will read more about suspension bridges and research famous bridges in the US online.

Teacher Note
If computers or Internet access are not available, please compile information/articles of different well known suspension bridges in the United States PRIOR to the lesson. Distribute the materials to different pairs/groups. Students will use the information you gathered to create a snapshot of their suspension bridge.

Technology
Students may want to visit their bridges using Google Earth.

Unit 6, Lesson 2 — Grades 7-8

Classroom Lesson - continued

Comprehensible Input - Literature
After reading the selected passages from *Bridges!,* divide the class into pairs and assign them a state from p. 91-92 that has a suspension bridge *(noted in list)*. Pairs are to use www.google.com to research the suspension bridge from the state they are responsible for. Students will use the template provided as a guide to create a snapshot of important information regarding their chosen bridge.

Pairs may use a program such as Microsoft Word or Publisher to create the snapshot or the website https://thimble.webmaker.org/project/20795/remix to create a meme for their bridge. The meme must meet all of the requirements of the snapshot.

Groups will present their snapshots and add any other interesting facts they discovered during their research. Display snapshots in the classroom or on the word wall.

Transition to Math
Students will learn about how the forces work on an arch bridge through the activity, Be A Stone in an Arch Bridge, p. 14. Divide the class into two teams *(do not have to be exact)* and explain that just like the activity during Transition to Math Lesson 1, they are NOT trying to make the other team fall down. The goal is to push toward the center as much as possible WITHOUT making the other team fall. They must create opposite but equal forces.

Repeat the activity with different teams *(boys vs. girls, girls vs. girls, boys vs. boys, teacher vs. class, few students vs. many, etc.)*. Discuss the observations made by the teams after each trial.

- Was it difficult to keep everyone in balance? Why or why not?
- Could you feel the opposite force?
- What was your strategy to keep the other team from falling?
- What adjustments to your force did your team make when you were considered the stronger side?

Explain to students that they will watch the TV Teacher demonstrate how to perform the bridge project for Follow-up Lesson 2. Even though they just completed an activity over forces on an arch bridge, they will return their attention to suspension bridges for the remainder of Lesson 2.

Objectives
Read through the math and language objectives, making sure that students understand how they accomplished each.

Unit 6 Lesson 2 – Classroom Lesson
One per pair/group

My Suspension Bridge Template

Work with your partner to research the suspension bridge assigned to you and record the requested information.

PICTURE

Name: _____

Type: _____

Built: _____

Length: _____

Location: _____

Creator: _____

Interesting facts: _____
_____
_____
_____
_____

Materials
- 2 kitchen chairs (or any chair that is similar in size and shape)
- spool of heavy string
- 4 heavy books
- masking tape
- cardboard (at least 1ft x 3ft)
- scissors
- single hole punch
- spool of thread or light string
- load (of choice – object available in room)
- **BLM** Hang a Suspension Bridge Instructions

Math and Literature Vocabulary
technology
engineer
architect
environmentalist
load
dam
suspension

Teacher Note
2012-2013 Math Matters Program STEM Projects
- Pile It On (pgs. 20-21)
- Making Concrete (pgs. 26-28)
- Flood Control (pg. 34)
- Build an Amazing Truss Bridge (pgs. 41-42)

Unit 6, Lesson 2 — Grades 7-8

TV Lesson

Math Objectives:
- Identify math in everyday situations.
- Explain and record observations using objects, words, pictures, numbers and technology.
- Make generalizations from patterns or sets of examples and non-examples.
- Justify why an answer is reasonable and explain the solution process.

Language Objectives:
- Listen to classmates and to teacher discuss and read.
- Speak, read and write vocabulary words in context.
- Brainstorm and discuss the various problems given.
- Create a chart of sorted items and explain how you decided to sort them.
- Create a list of things to do before building a skyscraper can begin.
- Justify your conclusions based on the results of your investigations.

Science Objectives:
- Demonstrate safe practices and the use of safety equipment as needed during investigations.
- Plan and implement descriptive investigations, including asking well-defined questions, making inferences, and selecting and using appropriate equipment or technology to answer the questions.
- Collect and record data by observing and measuring, using descriptive words and numerals such as labeled drawing, writing, and concept maps.
- Analyze data and interpret patterns to construct reasonable explanations from data that can be observed and measured.
- Communicate valid, oral and written results supported by data
- Brainstorm and discuss the various problems given.
- Generate charts to describe the outcomes of investigations.

Building Background
Students have read through the basics of different bridges, researched well know suspension bridges in the United States, and practiced how forces work on suspension and arch bridges during the Transition to Math activities.

The 2013 summer program projects are listed in the sidebar. Please feel free to integrate or supplement the previously mentioned projects into the curriculum should your class have minimal or no experience with them. Please refer to the literature selection for materials lists and procedures.

Teacher Note
Captain Portio will introduce information from *Bridges!* on p. 64.

Unit 6, Lesson 2 — Grades 7-8

TV Lesson - continued

Comprehensible Input
Review the Engineering Design Process posters.

Students will hang a suspension bridge during Follow-up Lesson 2.

Hanging a Suspension Bridge (taken directly from *Bridges!* p. 60)

1) Set up your towers *(the chairs)* on a rug *[if available]*. The foundation of your bridge will be the floor. Place the chairs back-to-back, as far apart as your arms can reach.
2) Tie the end of a heavy string to a book, which will act as an anchor. Put the book on one chair. Loop the string around the top of the chair and bring it to the other chair. Loop the string around the top of that chair, letting it sag in a curve between the chairs.
3) Cut the string and tie it around another book. Put the book on the other chair. Push this string to one side of the chairs. Make another cable in the same way on the other side. Tie it to the same books as the other one, making sure the two cables are even. The strings between the books and the chairs should be tight. If the string slips off the chairs, tape it in place.
4) Cut and tape cardboard to make a roadway long enough to reach farther than from book to book. It should be slightly wider than the distance between the cables. Lay the deck in place on the books, and put a third book on top. *[add another book as a weight to the opposite side – 4 books total]*
5) For hangers, tie pieces of thread along the length of both cables. make them long enough so they hang below the deck.
6) Punch holes along the deck where the hangers fall; then, thread a hanger through each hole. Tie them so the hangers are taut and the cardboard deck is level.
7) Now, put a load on your bridge.

Questions

- Can you see the tension in the cables and hangers?
- Does the string get tight?
- Do the anchors (books) move?
- If they do, how could you keep them in place?
- Does the deck sag?
- If it does, how could you make it stiffer?

Optional - Students may also test their bridges in the wind by putting a fan next to it and blowing air at different speeds.

	Unit 6, Lesson 2 **Grades 7-8** **TV Lesson** - continued  **----------** **Pirate's Corner** Upload pictures of your suspension bridges to MAS Space and share your experiences! Was it hard? Easy? Was your bridge strong enough to support a load? If so, how heavy? Did you run into any struggles? Did you have to make adjustments to your design? **Objectives** Read through the math and language objectives, making sure that students understand how they accomplished each.

Unit 6 Lesson 2 – TV Lesson and Follow-up

One per group

Hang a Suspension Bridge - Instructions

Materials:

- 2 kitchen chairs (or any chair that is similar in size and shape)
- spool of heavy string
- 4 heavy books
- masking tape
- cardboard (at least 1ft x 3ft)
- scissors
- single hole punch
- spool of thread or light string
- load (of choice – object available in room)

Instructions:

1) Set up your towers (the chairs) on a rug [if available]. The foundation of your bridge will be the floor. Place the chairs back-to-back, as far apart as your arms can reach.

2) Tie the end of the heavy string to a book, which will act as an anchor. Put the book on one chair. Loop the string around the top of the chair and bring it to the other chair. Loop the string around the top of that chair, letting it sag in a curve between the chairs.

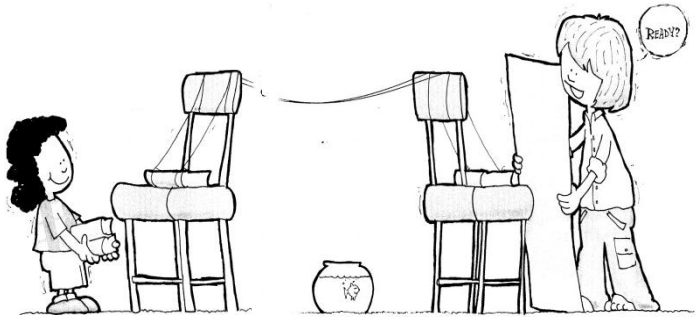
3) Cut the string and tie it around another book. Put the book on the other chair. Push this string to one side of the chairs. Make another cable in the same way on the other side. Tie it to the same books as the other one, making sure the two cables are even. The strings between the books and the chairs should be tight. If the string slips off the chairs, tape it in place.

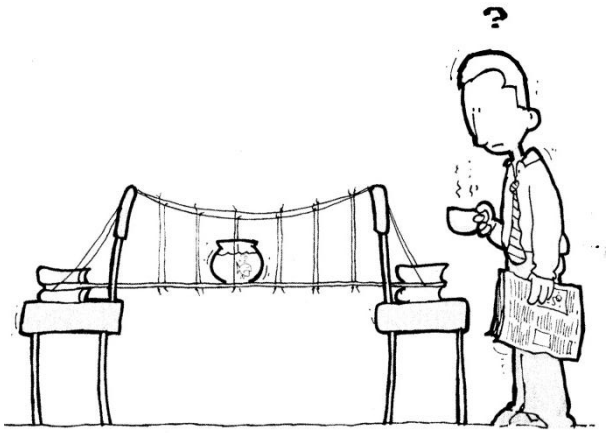
4) Cut and tape cardboard to make a roadway long enough to reach farther than from book to book. It should be slightly wider than the distance between the cables. Lay the deck in place on the books, and put a third book on top. [add another book as a weight to the opposite side – 4 books total]

5) For hangers, tie pieces of thread along the length of both cables. Make them long enough so they hang below the deck.

6) Punch holes along the deck where the hangers fall; then, thread a hanger through each hole. Tie them so the hangers are taut and the cardboard deck is level.

7) Now, put a load on your bridge.





**images used from Bridges! Amazing Structures to Design, Build and Test pgs.61-62*

Materials
- 2 kitchen chairs (or any chair that is similar in size and shape)
- spool of heavy string
- 4 heavy books
- masking tape
- cardboard (at least 1ft x 3ft)
- scissors
- single hole punch
- spool of thread or light string
- load (of choice – object available in room)
- **BLM** Hang a Suspension Bridge Instructions

Math and Literature Vocabulary
technology
engineer
architect
environmentalist
load
dam
suspension

Unit 6, Lesson 2 — Grades 7-8

Follow-up

Math Objectives:
- Identify math in everyday situations.
- Explain and record observations using objects, words, pictures, numbers and technology.
- Make generalizations from patterns or sets of examples and non-examples.
- Justify why an answer is reasonable and explain the solution process.

Language Objectives:
- Listen to classmates and to teacher discuss and read.
- Speak, read and write vocabulary words in context.
- Brainstorm and discuss the various problems given.
- Create a chart of sorted items and explain how you decided to sort them.
- Create a list of things to do before building a skyscraper can begin.
- Justify your conclusions based on the results of your investigations.

Science Objectives:
- Demonstrate safe practices and the use of safety equipment as needed during investigations.
- Plan and implement descriptive investigations, including asking well-defined questions, making inferences, and selecting and using appropriate equipment or technology to answer the questions.
- Collect and record data by observing and measuring, using descriptive words and numerals such as labeled drawing, writing, and concept maps.
- Analyze data and interpret patterns to construct reasonable explanations from data that can be observed and measured.
- Communicate valid, oral and written results supported by data.
- Brainstorm and discuss the various problems given.
- Generate charts to describe the outcomes of investigations.

Divide class into groups of three-four and distribute materials. Review the activity again making sure to address any questions or concerns.

Students will follow the directions provided on BLM Hanging a Suspension Bridge - Instructions.

Document the process by taking pictures of student groups working on the project.

	Unit 6, Lesson 2 **Grades 7-8** **Follow-up** - continued  --- Monitor student groups, stopping to ask thought provoking questions. **QUESTIONS** • What do you predict will happen if the cables aren't taut? • How is your design working? • Do you need to make any adjustments? • Is your deck straight and well supported? Why or why not? • What steps of the design process have you gone through? • What step of the design process are you on right now? Take pictures of the final products built by the students. **Recursive Review** *omitted* **Writing Topics** **Independent Writing Topic** *omitted* **Objectives** Read through the math and language objectives, making sure that students understand how they accomplished each.

Materials
- 1 oz turkey
- 1 slice Swiss cheese
- 1 leaf lettuce
- 1 TBS cranberry relish
- 1 burrito sized tortilla
- 2 paper dessert plates
- 2 paper towels
- 2 plastic knives

All items listed above per partner pair

Math and Literature Vocabulary
technology
engineer
architect
environmentalist
load
dam
suspension

Unit 6, Lesson 2 — Grades 7-8

Snack Fractions

Students should wash their hands before this activity if using food items.

Math Objectives
- Use addition, subtraction, multiplication and division to solve problems involving fractions, decimals, ratios, and percents.
- Convert between fractions, decimals, and percents.
- Estimate to find solutions to problems involving fractions, decimals, and percents.

Language Objectives
- Discuss how fractions, decimals, ratios, and percents can be used to solve real-world problems.

Snack Fractions
Snack Fractions will be simple during this unit because of the extensive project design in the main lesson pieces. Students simply share and answer orally administered questions *(examples provided)*.

The Snack Fraction activities for this lesson will focus on dividing into halves. Teacher will facilitate mathematical conversations during this lesson instead of providing a record sheet to students.

Students will divide ingredients equally between partners and build their turkey wrap.

QUESTIONS
- What is the whole in this situation?
- How did you break this up into equal shares if some of the ingredients are different shapes and textures?
- Does this fraction have an easily calculated decimal equivalent?
- How can you find the decimal of this fraction?
- How did you calculate the percent?
- What would happen if one more person joined your group?

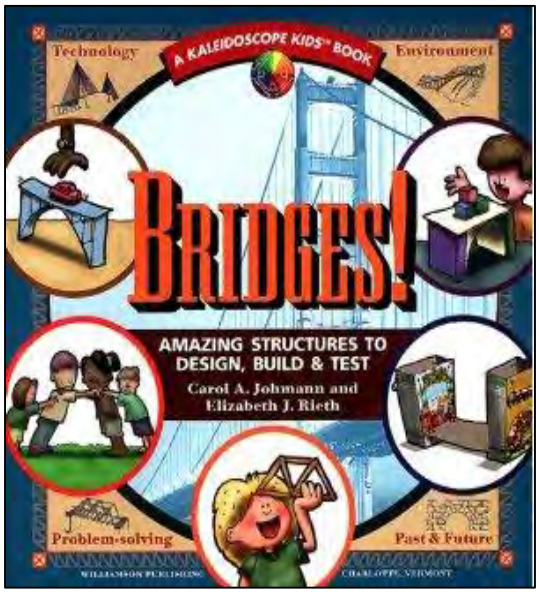
Once the activity is complete, let them enjoy their snack!

Snack Fraction Journal Writing: BLM Turkey Wrap-Snack Fractions
omitted

Objectives
Read through the math and language objectives, making sure that students understand how they accomplished each.

Unit 6 Lesson 2 – Family Fun

Dear _____,



We did another project from the book ***Bridges! Amazing Structures to Design, Build and Test*** by Carol A. Johmann and Elizabeth J Rieth.

The structure we designed and built today was a…

_____

A cofferdam could have been used to help build the suspension bridge because…

_____

_____

Sincerely,

_____

Materials
- **BLM** Fraction Action and *X* Marks the Spot
- **BLM** Lessons 2-3 CGI *Bridges! Amazing Structures to Design, Build and Test*

Math Objectives
- Model and solve multistep word problems.
- Solve problems involving fractions, ratios, and proportions.

Language Objectives
- Speak to partners, teacher, and class using vocabulary.
- Discuss problem solving process and strategies.

Math and Literature Vocabulary
technology
engineer
architect
environmentalist
load
dam
suspension

Assessed TEKS for this Unit
5th – 5.3H, 5.3K
6th – 6.4C, 6.4D, 6.4E, 6.5B, 6.5C

Unit 6, Lesson 3 — Grades 7-8

Daily Routine

The following daily activities will help prepare your students for the Post-assessment. They are not optional.

ESSENTIAL

Measurement Lab
omitted

Solve It! Multi-step problem solving
omitted

Fraction Action
- Lesson 1 – *omitted*
- Lesson 2 – (5th assessment item 1,2,3)
- **Lesson 3 – (5th assessment item 6)**

***X* Marks the Spot**
- Lesson 1 – *omitted*
- Lesson 2 – (6th assessment item 2)
- **Lesson 3 – (6th assessment item 8)**

CGI
- Lesson 1 – omitted
- Lesson 2 – Compare Referent Unknown (5th assessment item 5)
- **Lesson 3 – Price Partitive Division (6th assessment item 6)**

The following activities, although certainly developmentally appropriate for your 7th and 8th grade students, do not specifically address objectives assessed on the Post-assessment. Schools with shorter teaching spans can consider omitting some or all these activities as your time permits.

OPTIONAL

Target Number
omitted

Money Matters
(*If you have a full program and wish to use this optional activity, you will find BLMs and Explanations in the Optional Activities Tab of your Teacher's Guide*.)

Unit 6 Lesson 3 – Daily Routines – Fraction Action and *X* Marks the Spot

One per student

Fraction Action

**approximate thirds*

$$10.33 + 8\frac{5}{6} - 4\frac{1}{2} = ?$$

X Marks the Spot

Solve for x (percent of tip)

Joel left an extra \$15 tip on a bill that was originally \$45. What percent (x) of the original bill was the tip?

Materials
- computer with Internet access (1 per class or 1 per pair of students)
- printer
- **BLM** My Bridge that Lifts Template

Literature Selection
Bridges! Amazing Structures to Design, Build, and Test
by Carol A. Johmann and Elizabeth J. Rieth
p. 68, p. 70, and top of p. 71

Math and Literature Vocabulary
technology
engineer
architect
environmentalist
load
dam
suspension

Unit 6, Lesson 3 — Grades 7-8

Classroom Lesson

Every day teachers must post the objectives on the board, read them to the students, and have students read them together with the teacher. At the end of the lesson, teacher and students should review to see if they have accomplished both math and language objectives.

Math Objectives:
- Identify math in everyday situations.
- Explain and record observations using objects, words, pictures, numbers and technology.
- Make generalizations from patterns or sets of examples and non-examples.
- Justify why an answer is reasonable and explain the solution process.

Language Objectives:
- Listen to classmates and to teacher discuss and read.
- Speak, read and write vocabulary words in context.
- Brainstorm and discuss the various problems given.
- Create a chart of sorted items and explain how you decided to sort them.
- Create a list of things to do before building a skyscraper can begin.
- Justify your conclusions based on the results of your investigations.

Science Objectives:
- Demonstrate safe practices and the use of safety equipment as needed during investigations.
- Plan and implement descriptive investigations, including asking well-defined questions, making inferences, and selecting and using appropriate equipment or technology to answer the questions.
- Collect and record data by observing and measuring, using descriptive words and numerals such as labeled drawing, writing, and concept maps.
- Analyze data and interpret patterns to construct reasonable explanations from data that can be observed and measured.
- Communicate valid, oral and written results supported by data.
- Brainstorm and discuss the various problems given.
- Generate charts to describe the outcomes of investigations.

Building Background
Review Frayer model vocabulary posters created in Lesson 1. Make any additions to the examples and non-examples if suggested by students.

Review some of the suspension bridge snapshots created by the students in Lesson 2.

Teacher Note
If computers or Internet access are not available, please compile information/articles of different well known suspension bridges in the United States PRIOR to the lesson. Distribute the materials to different pairs/groups. Students will use the information you gathered to create a snapshot of their suspension bridge.

Technology
Students may want to visit their bridges using Google Earth.

Unit 6, Lesson 3 — Grades 7-8

Classroom Lesson - continued

Building Background - Literature
Transition to Math Lesson 1 and 2 activities allowed students to explore the forces on a suspension and an arch bridge. Today they will read about bridges that move *(or lift)* and research famous bridges around the world online.

Comprehensible Input - Literature
Repeat activity from Lesson 2, but globally. After reading the selected passages from *Bridges!,* divide the class into pairs and assign them a state or country from pgs. 91-92 that has a moveable bridge *(noted in list)*. Pairs are to use www.google.com to research the moveable bridge from the state or country they are responsible for. Students will use the template provided as a guide to create a snapshot of important information regarding their chosen bridge.

Pairs may use a program such as Microsoft Word or Publisher to create the snapshot or the website, https://thimble.webmaker.org/project/20795/remix, to create a meme for their bridge. The meme must meet all of the requirements of the snapshot.

Groups will present their snapshots and add any other interesting facts they discovered during their research. Display snapshots in the classroom or on the word wall.

Transition to Math
Students will continue to learn about how forces work on bridges through the activity, Balance Like a Bridge, p. 14. Divide the class into two teams *(do not have to be exact)* and explain that just like the activity during Transition to Math Lessons 1 and 2, they are NOT trying to make the other team fall down or throw them off balance. The goal is to balance as much as possible WITHOUT making the other team fall. They must create opposite but equal forces.

Repeat the activity with different teams *(boys vs. girls, girls vs. girls, boys vs. boys, teacher vs. class, few students vs. many, etc.)*. Discuss the observations made by the teams after each trial.

- Was it difficult to keep everyone in balance? Why or why not?
- Could you feel the opposite force?
- What was your strategy to keep the other team from falling?
- What adjustments to the push/pull did your team make when you were considered the stronger side?

	Unit 6, Lesson 3 **Grades 7-8** **Classroom Lesson** – continued  --- Explain to students that they will watch the TV Teacher demonstrate how to perform the bridge project for Follow-up Lesson 3. They will turn their attention to bridges that move for the remainder of Lesson 3. **Objectives** Read through the math and language objectives, making sure that students understand how they accomplished each.

Unit 6 Lesson 3 – Classroom Lesson
One per pair/group

My Bridge That Lifts Template

Work with your partner to research the bridge assigned to you and record the requested information.

PICTURE

Name: _____

Type: _____

Built: _____

Length: _____

Location: _____

Creator: _____

Interesting facts: _____
_____
_____
_____
_____

Materials
- hole punch
- scissors
- string
- 2 empty cereal boxes
- 1 piece of thin cardboard (about the size of the boxes)
- drinking straw cut in half
- **BLM** Lift That Bridge! Instructions

Math and Literature Vocabulary
technology
engineer
architect
environmentalist
load
dam
suspension

Teacher Note
2012-2013 Math Matters Program STEM Projects
- Pile It On (pgs. 20-21)
- Making Concrete (pgs. 26-28)
- Flood Control (pg. 34)
- Build an Amazing Truss Bridge (pgs. 41-42)

Unit 6, Lesson 3 — Grades 7-8

TV Lesson

Math Objectives:
- Identify math in everyday situations.
- Explain and record observations using objects, words, pictures, numbers and technology.
- Make generalizations from patterns or sets of examples and non-examples.
- Justify why an answer is reasonable and explain the solution process.

Language Objectives:
- Listen to classmates and to teacher discuss and read.
- Speak, read and write vocabulary words in context.
- Brainstorm and discuss the various problems given.
- Create a chart of sorted items and explain how you decided to sort them.
- Create a list of things to do before building a skyscraper can begin.
- Justify your conclusions based on the results of your investigations.

Science Objectives:
- Demonstrate safe practices and the use of safety equipment as needed during investigations.
- Plan and implement descriptive investigations, including asking well-defined questions, making inferences, and selecting and using appropriate equipment or technology to answer the questions.
- Collect and record data by observing and measuring, using descriptive words and numerals such as labeled drawing, writing, and concept maps.
- Analyze data and interpret patterns to construct reasonable explanations from data that can be observed and measured.
- Communicate valid, oral and written results supported by data.
- Brainstorm and discuss the various problems given.
- Generate charts to describe the outcomes of investigations.

Building Background
Students have read through the basics of different bridges, researched well know suspension bridges in the United States, and practiced how forces and balancing works on suspension and arch bridges during the Transition to Math activities.

The 2013 summer program projects are listed in the sidebar. Please feel free to integrate or supplement the previously mentioned projects into the curriculum should your class have minimal or no experience with them. Please refer to the literature selection for materials lists and procedures.

Teacher Note
Captain Portio will introduce information from *Bridges!* on p. 72.

Unit 6, Lesson 3 — Grades 7-8

TV Lesson - continued

Comprehensible Input
Review the Engineering Design Process posters.

Students will build a bridge that lifts during Follow-up Lesson 3.

Lift That Bridge! (taken directly from *Bridges!,* p. 73)

1) To prepare the bridge span, punch a hole in each corner of the cardboard.
2) To prepare the towers, cut the top flaps from each cereal box. Punch holes on the front and back of the boxes. *[4 corners]*
3) To assemble the bridge, arrange the string guide wires so the span can be raised evenly. Put string through one corner of the span and, then, through the bottom hole of one tower.
4) Bring the string up inside the tower and out a front hole on the same side. Tie the ends together tightly. Repeat for the other corner. Then, repeat for the other tower.
5) Cut two pieces of string, each about 5 feet *(1.5m)*. Tie one piece around one hole in the span. Then, lace it through the second hole at the top of the tower and out through the hole in the back. Pull the string through half a straw.
6) Feed the string through the other hole in the back of the tower and out the front. Tie it off at the hole on the other side of the span. Tie it so the straw hangs level, about 2 inches *(5cm)* down the tower. Repeat steps 5 and 6 for the other tower.
7) To make your bridge work, grasp the straws and gently pull down. Watch your bridge rise!

Questions

- Can you think of other ways to lift up your bridge?
- Can you see the tension in the cables?
- How are you keeping the span level while lifting?
- Does your bridge lift a load? How heavy?
- How can you improve this design?

Pirate's Corner
Upload pictures of your lift-bridges to MAS Space and share your experiences! Was it hard? Easy? Was your bridge strong enough to support a load? If so, how heavy? Did you run into any struggles? Did you have to make adjustments to your design?

Objectives
Read through the math and language objectives, making sure that students understand how they accomplished each.

Unit 6 Lesson 3 – TV Lesson and Follow-up

One per group

Lift That Bridge! - Instructions

Materials:

- hole punch
- scissors
- string
- 2 empty cereal boxes
- 1 piece of thin cardboard (about the size of the boxes)
- drinking straw cut in half

Instructions:

1) To prepare the bridge span, punch a hole in each corner of the cardboard.

2) To prepare the towers, cut the top flaps from each cereal box. Punch holes on the front and back of the boxes. [4 corners]

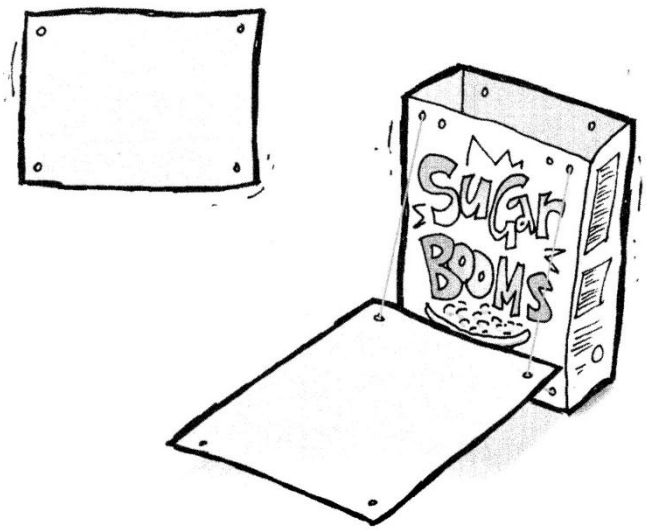
3) To assemble the bridge, arrange the string guide wires so the span can be raised evenly. Put string through one corner of the span and, then, through the bottom hole of one tower.

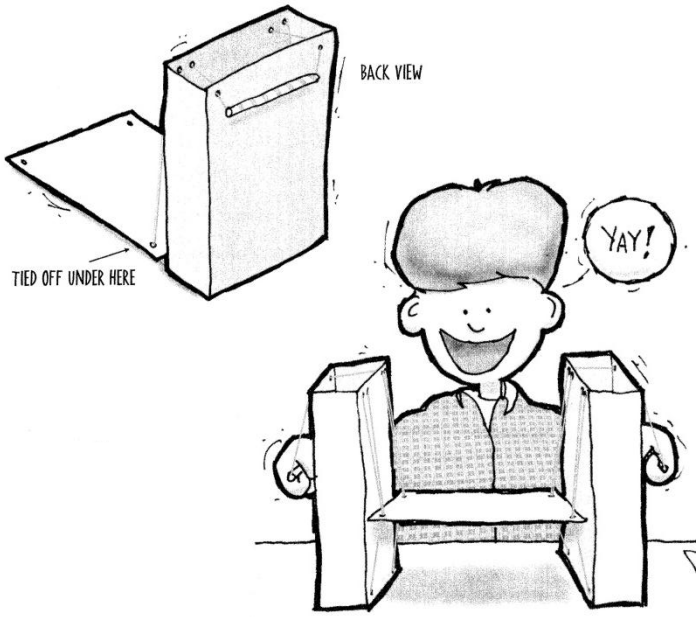
4) Bring the string up inside the tower and out a front hole on the same side. Tie the ends together tightly. Repeat for the other corner. Then, repeat for the other tower.

5) Cut two pieces of string, each about 5 feet (1.5m). Tie one piece around one hole in the span. Then, lace it through the second hole at the top of the tower and out through the hole in the back. Pull the string through half a straw.

6) Feed the string through the other hole in the back of the tower and out the front. Tie it off at the hole on the other side of the span. Tie it so the straw hangs level, about 2 inches (5cm) down the tower. Repeat steps 5 and 6 for the other tower.

7) To make your bridge work, grasp the straws and gently pull down. Watch your bridge rise!





**images used from Bridges! Amazing Structures to Design, Build and Test pgs.73-74*

Materials
- hole punch
- scissors
- string
- 2 empty cereal boxes
- 1 piece of thin cardboard (about the size of the boxes)
- drinking straw cut in half
- **BLM** Lift That Bridge! Instructions

Math and Literature Vocabulary
technology
engineer
architect
environmentalist
load
dam
suspension

Unit 6, Lesson 3 — Grades 7-8

Follow-up

Math Objectives:
- Identify math in everyday situations.
- Explain and record observations using objects, words, pictures, numbers and technology.
- Make generalizations from patterns or sets of examples and non-examples.
- Justify why an answer is reasonable and explain the solution process.

Language Objectives:
- Listen to classmates and to teacher discuss and read.
- Speak, read and write vocabulary words in context.
- Brainstorm and discuss the various problems given.
- Create a chart of sorted items and explain how you decided to sort them.
- Create a list of things to do before building a skyscraper can begin.
- Justify your conclusions based on the results of your investigations.

Science Objectives:
- Demonstrate safe practices and the use of safety equipment as needed during investigations.
- Plan and implement descriptive investigations, including asking well-defined questions, making inferences, and selecting and using appropriate equipment or technology to answer the questions.
- Collect and record data by observing and measuring, using descriptive words and numerals such as labeled drawing, writing, and concept maps.
- Analyze data and interpret patterns to construct reasonable explanations from data that can be observed and measured.
- Communicate valid, oral and written results supported by data
- Brainstorm and discuss the various problems given.
- Generate charts to describe the outcomes of investigations.

Divide class into groups of three-four and distribute materials. Review the activity again making sure to address any questions or concerns.

Students will follow the directions provided on BLM Lift That Bridge! - Instructions.

Document the process by taking pictures of student groups working on the project.

	Unit 6, Lesson 3 **Grades 7-8** **Follow-up** - continued  --- Monitor student groups, stopping to ask thought provoking questions. **QUESTIONS** • What do you predict will happen if the cables aren't the same length? • How is your design working? • Do you need to make any adjustments? • Is your span straight, level, and well supported? Why or why not? • What steps of the design process have you gone through? • What step of the design process are you on right now? Take pictures of the final products build by the students. **Recursive Review** *omitted* **Writing Topics** **Independent Writing Topic** *omitted* **Objectives** Read through the math and language objectives, making sure that students understand how they accomplished each.

Materials
- 1 personal pan pizza
- 2 individual servings of juice
- 2 paper dessert plates
- 2 paper towels
- 2 plastic knives

All items listed above per partner pair

Math and Literature Vocabulary
technology
engineer
architect
environmentalist
load
dam
suspension

Unit 6, Lesson 3 — Grades 7-8

Snack Fractions

Students should wash their hands before this activity if using food items.

Math Objectives
- Use addition, subtraction, multiplication and division to solve problems involving fractions, decimals, ratios, and percents.
- Convert between fractions, decimals, and percents.
- Estimate to find solutions to problems involving fractions, decimals, and percents.

Language Objectives
- Discuss how fractions, decimals, ratios, and percents can be used to solve real-world problems.

Snack Fractions
Snack Fractions will be simple during this unit because of the extensive project design in the main lesson pieces. Students simply share and answer orally administered questions *(examples provided)*.

The Snack Fraction activities for this lesson will focus on dividing into halves. Teacher will facilitate mathematical conversations during this lesson instead of providing a record sheet to students.

Students will share pizza equally between partners and verbally answer the questions the teacher asks.

QUESTIONS
- What is the whole in this situation?
- How did you break this up into equal shares?
- Does this fraction have an easily calculated decimal equivalent?
- How can you find the decimal of this fraction?
- How can you calculate the percent?
- What would happen if one more person joined your group? Two more people? Three more people?
- What happens to the size of the slices as more people join?

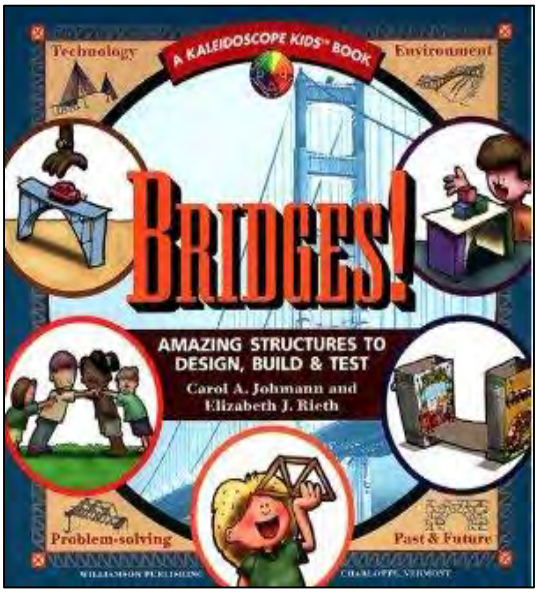
Once the activity is complete, let them enjoy their snack!

Snack Fraction Journal Writing: BLM Veggie Pizza-Snack Fractions
omitted

Objectives
Read through the math and language objectives, making sure that students understand how they accomplished each.

Unit 6 Lesson 3 – Family Fun

Dear _____,



We did another project from the book ***Bridges! Amazing Structures to Design, Build and Test*** by Carol A. Johmann and Elizabeth J Rieth.

This time our bridge moved! We researched moveable bridges across the world and this is what I learned…

_____
_____
_____
_____

Sincerely,

_____