Do the Science

Northwest Educational Service District 189
Together We Can
Math & Science Collaborative Inquiry Project

Lesson Title: Energy Forms 6-8 PS3A (revised version as per team analysis and adjustment) **Grade** 6-8

Unit Learning Target: Energy can be transferred from one place to another and transformed from one form to another.

Lesson Learning Target: *What are the students expected to be able to do in student language?*

I can use words and pictures to list at least five forms of energy. I can describe how I use 3 of these of these forms of energy in my daily life.

Previous Learning to Target: Energy has many forms.

Learning Task:
Identify and label energy forms used in everyday life.

Vocabulary

Standards	Text
Heat	Thermal
Light	Electromagnetic
Motion	Kinetic
Chemical	Chemical
Electrical	Electrical
Sound	*Not mentioned*
Not mentioned	Potential
Not mentioned	Mechanical
Not mentioned	Nuclear

Do the Math/Science

Use lenses of both learner and teacher. Examine your thinking. What concepts/ skills/reasoning did you use to solve the task? Identify those that represent prior knowledge.

- **Some students may have the misconception that only living organisms require energy.**
- **The textbook and the state standards use different terms for some energy forms (see key vocab. above). Develop the lesson in such a way that students can state that thermal = heat, kinetic = motion, and one form of electromagnetic energy = light.**
- **In the state standards, sound is listed as a form of energy, but sound is not mentioned in the textbook. Develop the lesson to include sound as a form of energy.**
- **Because "nuke it" is a term often use in conjunction with microwave ovens, some students may think microwaves are a form of nuclear energy. In their textbooks, students will read that microwaves are a form of electromagnetic energy.**
- **Some students will not be able to list 6 forms of energy. Require 5 forms to meet standard.**
- **During the sticky note activity, some students will have questions. Have a place ready where students can post their questions.**
- **The content reading may be difficult for some students. Use pre reading strategies to assure student success.**
- **This lesson may require more time than one period. Identify a good place to break the lesson into two sessions.**
- **Describing how they use energy may be difficult for students. Scaffold how to describe using energy.**
- **To help students focus on the energy forms named in the state standards, prepare models of thermal, light, chemical, electrical, kinetic and sound energy.**
- **In their journals, some students may want to simply draw the energy forms to answer the formative question. Remind students of the target language: "Using words and pictures. . . ." Drawings need to be described in words with labels and captions.**

Identify Success Criteria

What success criteria will determine if learning has occurred?
Using words and pictures, students can list at least 5 types of energy and describe how at least 3 of these energy forms are used in daily life.

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Time	Draft the lesson flow	Anticipated responses	Formative Assessments
	How should the lesson progress?	What correct/incorrect student responses can we anticipate? What is our reasoning?	What do we want the learners to know? How will we know learning expectations are met? What will be our evidence?
	Prior to the lesson, to help students focus on the six energy forms named in the state standards, prepare models of the first six energy forms listed in the table to the right. Make a copy if the attached vocabulary scaffold for each student.	**Key Vocabulary Terms for Lesson:** 1 Heat / Thermal 2 Light / Electromagnetic 3 Motion / Kinetic 4 Chemical / Chemical 5 Electrical / Electrical 6 Sound / *Not mentioned* 7 *Not mentioned* / Potential 8 *Not mentioned* / Mechanical 9 *Not mentioned* / Nuclear Text used: *Prentice Hall Science Explorer; motion, forces and energy.* ©2009	
1 min.	Share the learning target both visually and verbally.		
7 min.	Warm-Up: Answer the question "What is energy?" Think, write, pair, share: Each student records an answer in their notebook, shares their answer with a partner, and then the whole group.	Be sure students sitting in groups with an uneven number of students all know who their partner is.	
10 min.	Questions: "How could you get to school in the morning?" In their notebooks, students record possible methods of transportation for getting to school. Then, elbow partner share ideas and add to their list. "Which of these methods require energy?" "Do they all require the same kind of energy?"	(All) (No)	Formative assessment check: All forms of transportation require some form of energy. Walk around and listen to group conversations to determine student understanding. A common misconception is that energy is associated with only living things.
25 min.	On group whiteboards: students categorize methods of transportation according to the type of energy. Some possible categories: food energy, gasoline energy, a horse's energy. "Now we're at school, what types of energy are being used in this classroom right now? Talk in your table groups, and add your ideas to your white board. You may add more categories." Some possible ideas: electrical energy, heat energy, light energy. (Students may walk around and look at other groups' whiteboards for more ideas)	Clarify that, at this time, we don't expect them to know the scientific names of forms of energy.	Hold everyone accountable for group work: Visit each group and tell them who their reporter will be (choose a student that does not usually hold

	Pass out >6 post-it notes for each student. Sharing: have each group's reporter share one new energy type going around the room. As they listen, students write one energy type on each of their post-it notes. As each group's reporter shares, take pictures of students' whiteboards for class discussion tomorrow. Or collect the boards keeping the students' work intact.		themselves accountable and/or capable). Tell the rest of the group they are responsible to help the reporter know what the group wants him/her to report to the class during the sharing time.
8 min.	Label models: Direct the students' attention to the models of the six energy-forms. Challenge students to use their post-it notes to label the energy models with the type of energy each represents. Once a student has labeled each model, he/she may label any other types of energy they find in the room.		
15 min.	Introduce the standards vocabulary for 6 forms of energy: Hand out the scaffold vocabulary sheets. These are words scientists use when talking or writing about the forms of energy represented by the models in the room. Have the students fill in the top half of the sheet. They will complete the bottom half tomorrow.		
 30 min.	Read silently (segmented by energy type) p.153-155. Each student makes a sticky note with each type of energy with a description of that energy type. When everyone is ready, give them 5 minutes to silently go around the room and place all sticky notes on objects corresponding to that energy type. After students have placed all sticky notes, they can write a question mark on any sticky notes they want to discuss (wonder about placement). Follow up with discussion as dictated by activity. Journal Write: Describe 6different types of energy. Describe how you use at least 3 of them in your life outside of school. (Complete sentences OR in chart form)	Create "question box" on the front whiteboard for any type of energy students are unable to place and want to discuss with the class. *Stress 6 different types of energy*	

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Some Forms of Energy to Know		Thermal (Heat) Energy	Chemical Energy	Electromagnetic (Light) Energy	Electrical Energy	Kinetic (Motion) Energy	Sound Energy
Think about the models you just labeled. Which model represents each form of energy given here? Draw the model under the form of energy it represents.							
Write the word you used to label each model.							
Mechanical Energy	**Nuclear Energy**						