

Unit: Representing Proportions

<p>Standard/Performance Expectation(s): 7.2.E – Represent proportional relationships using graphs, tables, and equations, and make connections among the representations.</p>	
<p>Building Block Objective/Learning Target : I can set up a proportion matching a real-life situation.</p>	<p>Common Misconceptions:</p> <ul style="list-style-type: none"> • Mismatching proportion (e.g. equating part to part with part to whole) • Misidentifying all positive relationships as proportional
<p>Communication Technique: The instructor will go over the learning target at the beginning of the lesson and make the purpose of the assignment clear to the students.</p>	
<p>Elicitation Activity*: Students will use random sampling and proportions to estimate the population of fish in lakes.</p>	
<p>Topic introduction/lesson Activities:</p> <ul style="list-style-type: none"> • Ask for 4 volunteer students. These volunteers will take 2 modest handfuls of fish (centimeter cubes) from the lake (shoebox or other container) and count how many fish are in their handfuls (2 students in each lake). While the volunteers are performing this task, the instructor will explain the real world parallels of catch and release in lakes, deer populations, whales, etc... • The 4 volunteers replace their handfuls of fish with an equal number of black fish (cubes) to represent the tagged fish. • 2 volunteer student students mix up the lakes while the teacher explains that the scientist then wait long enough for the animals to mix themselves in the wild before returning to catch them again. • After this initial set-up the groups of students will be acting as teams of scientists to estimate how many fish are in the lake by taking handfuls of fish and analyzing what proportion of these samples are tagged fish (black cubes). They will need to record their data (one sampling per student in group), discuss how to incorporate all their samples into their estimate, and discuss how to estimate the number of fish in the lake. Finally the student will need to prepare a report for their “bosses” detailing their procedure from start to finish (including the part done before they were split into group), displaying their data, and justifying why their procedure gives them a good estimate of how many fish are in the lake. • During the activity the instructor will circulate among the students and answer clarifying questions. Students will likely be confused at first, it will also be the instructor’s job to encourage them to discuss their ideas as a group and come to a consensus on how to proceed. The instructor will note the strategies students are using to solve the problem and select groups to present their solutions at the end of the period based on the sophistication of their strategies (increasing order of sophistication). • At the end of the period, students will present their strategies to the whole group in the order determined by the instructor. 	

Formative Task or question:

The students are placed in small groups during the instruction activity. The instructor will be able to assess understanding by monitoring students' discussions and progress.

Formative Technique:

The instructor will use the time available to small group work to make contact with each group and assess their understanding. The teacher should single out students and ask them to explain what their group is working on so far. The instructor is encouraged to especially seek out "benchmark" students. Benchmark students might be students who are usually late in understanding a new concept or whose level of understanding has often been representative of the class as a whole in the past.

Adjustment Trigger *What level of student performance will necessitate an instructional adjustment?*

Instructional Adjustment (if needed):

When placing students into their groups, the teacher may wish to consider student abilities. It is recommended that low students be placed in groups with mid-level students with whom they can work productively. An individual student in a group that is having difficulty grasping the strategy being implemented by the other students can play the role of the skeptic boss. The other students need to convince him that their idea is better or as good as his idea.

Lesson Closure*: At the end of the lesson the students should present their solutions. The instructor will refer back to the learning target by asking or in some other way ensuring that each group explains how they turned their real life data and situation into a proportion.

* Opportunity for formative assessment