

Area/Skill - Mathematics	Cognitive Skill Level - Application	Correlation to Framework - 05.01	Lesson Number - 36
<p>Activity Title - Me and My Shadow</p> <p>Goal/Objective</p> <p>To determine the heights of objects through the use of ratio and proportion.</p> <p>Lesson Outline</p> <p>Introduction</p> <p>Sometimes people need to know the height of an object, but it is too tall to measure with traditional methods. This lesson will teach students how to use ratio and proportion to calculate the height of a tree.</p> <p>Activity</p> <p>Provide students with a real-life scenario such as the following. Recently, beetles infected several Florida pines at a local technical school. Everyone wanted to know if the trees would fall on a building. In order to determine whether or not the trees needed to be sawed down for safety sake, students assessed the height of the trees and whether or not they would indeed crash into a building if they fell.</p> <p>Teach students to use ratio/proportion in order to calculate the height of the tree. This can be taught through first having students measure themselves and their respective shadows during the middle of the day. Students should then measure the shadow of the tree. Set up a proportion where the ratio of the shadow of the student to the height of the student equals the ratio of the shadow of the tree to the unknown, which is the height of the tree.</p> <p>Debriefing/Evaluation Activity</p> <p>Have students solve additional problems using ratios and proportions. For verification of this method, have students measure an object and compare the exact height with the height found by using the proportional method.</p>			<p>Materials/Texts/Realia/Handouts</p> <ul style="list-style-type: none"> • Measurement tools - yard sticks/ meter sticks/50 foot tape measurers • Paper and pencils • Real-life objects for the purpose of measurement
<p>Real-Life Connection</p> <p>Brainstorm with students other real-world problem situations where ratio and proportion can provide numeric solutions.</p>			<p>Extension Activity</p> <p>Have students create different ratios based on characteristics of their class. An example would be the number of males versus females in the class or the number of married versus single students, etc.</p> <p>ESE/ESOL Accommodations</p> <p>Provide students with a handout that includes the known facts in a proportion so that they can see the missing factor.</p> <p>Define the basic terms used in the lesson both orally and in writing.</p>

GED 2002 Teachers' Handbook of Lesson Plans

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Activity Title - Me and My Shadow			
Introduction			
<i>Ask:</i> Has anyone ever had to measure something so tall that traditional measurement tools just wouldn't work?			
<i>Say:</i> Sometimes people need to know the height of an object, but it is too tall to measure with traditional methods. Today, you will use a different method to figure out the height of a very tall object.			
Main Activity			
<i>Say:</i> Recently, beetles infected several Florida pines at a local technical school. Everyone wanted to know if the trees would fall on a building. In order to determine whether or not the trees needed to be sawed down for safety sake, the height of the trees needed to be determined. Since the trees were too tall to measure in the traditional way, the students needed an alternative method to figure out the height of the trees. Let's see if we can use the same method that the students at the technical school used. First, we need to go outside and complete some measurements.			
Make sure that students complete this activity during the middle of the day when the sun is at a high point in the sky.			
<i>Say:</i> We are going to measure a tree on our own school property. First, I need each of you to have someone measure your own height. Write your height down on a piece of paper. Next, have someone measure your shadow. Write that figure down as well. Finally, measure the shadow of the tree. Now we have three numbers with which to work.			
Teach students to use ratio/proportion in order to calculate the height of the tree. Define the words ratio and proportion for the students.			
<i>Say:</i> Now we are read to set up a proportion where the ratio your shadow to your height equals the ratio of the shadow of the tree to the unknown, which is the height of the tree.			
<i>Ask:</i> What is the height of the tree?			
Debriefing/Evaluation Activity			
<i>Say:</i> As you can see, using the proportional method can help us measure an object that is too tall for us to measure in the traditional way. <i>Ask:</i> Is the answer reasonable? How would you prove or disprove this method?			
Have students solve additional problems using ratios and proportions. For verification of the method, have students measure an object and compare the exact height with the height found by using the proportional method.			
Follow-up Lessons/Activities			
Have students create additional problems that require the use of ratios and proportions.			