

Proportional Measurements

Jillian Scheschuk
EDTC 613: Digital Image Acquisition
Summer II 2016

Audience

- Northern Highlands Regional High School
- Allendale, NJ
- 9th Grade
- College Prep Algebra 1
- Approx. 15-25 students



Goals & Objectives

Essential Question: How can we determine measurements from images?

- ★ Students will use digital images to write and solve proportions in order to calculate unknown measurements.
- ★ CCSS.MATH.CONTENT.HSA.CED.A.1: Create equations in one variable and use them to solve problems.
- ★ CCSS.MATH.CONTENT.HSA.REI.A.1: Understand solving equations as a process of reasoning and explain the reasoning.
- ★ CCSS.MATH.CONTENT.HSN.Q.A.1: Reason quantitatively and use units to solve problems.
- ★ CCSS.MATH.CONTENT.HSN.Q.A.2: Define appropriate quantities for the purpose of descriptive modeling.

Lesson Overview

BIG IDEA: If two ratios are equal and a quantity in one of the ratios is unknown, the unknown quantity can be found by writing and solving a proportion.

This lesson is an application of proportions, equations that students have previously learned how to solve. I took all photos used in this presentation.

Students will be given digital copies of various images as well as the true measurement of one object in the image. They will be asked to use the given measurement to determine the scale factor of the image as well as solve for additional measurements in the image.

For further application, they will take their own photos and create a new task that they will give to a classmate. They may also use Fotor or iPhoto to edit and manipulate their images.

Before Editing



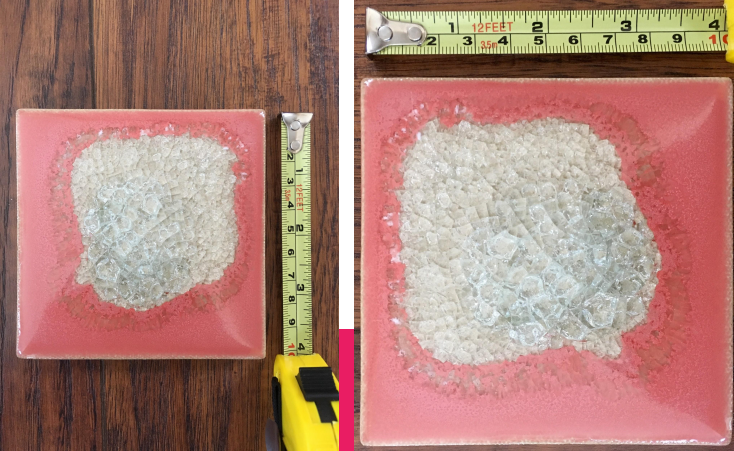
After Editing



Examples

Question:

“Based on the length shown on the tape measure, calculate the height of the letter ‘B’.”



^ Before ——— After ^

“Using the true measurement shown, find the scale factor of the image of the coaster.”



^ Before ——— After ^

“Using the length of the coaster, find the length of the sunglasses case.”



< Before ——— After >

“Based on the previous lengths found, calculate the scale factor by which the image was stretched horizontally.”





^ Before — After ^

“Using the measurement shown, find the height of the lantern and the candle inside of it.”



^ Before — After ^

“Based on the previous lengths found, calculate the height of the lantern on the right.”



< Before — After >

“Using the length of the parrot, find the length of the football.”





^ Before ——— After ^
“Using the measurement shown, find the length of the shoe.”



^ Before ——— After ^
“Using the measurement shown, find the height of one pineapple, as well as the dimensions of the mat.”



< Before ——— After >
“Using the measurement shown, find the length of the couch.”

