

## KEY CONCEPT OVERVIEW

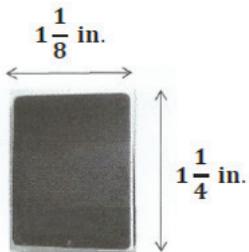
In the final topic of the module, students extend their knowledge of proportional relationships into geometry, analyzing **scale drawings** to determine whether they represent a reduction or an enlargement of the original figure or picture. In this topic, students are introduced to **scale factor**, connecting it to the now-familiar concepts of unit rate and constant of proportionality. The topic concludes with students applying their knowledge to create their own scale drawings of the top view (view from above) of their bedrooms.

You can expect to see homework that asks your child to do the following:

- Determine whether a scale drawing is an enlargement or a reduction of the original figure.
- Calculate the dimensions of a scale drawing.
- Calculate the dimensions of the original figure.
- Use knowledge of unit rate to calculate the scale factor.
- Use knowledge of scale factor to efficiently calculate the area of a scale drawing.
- Create a scale drawing of the top view of student’s bedroom.

## SAMPLE PROBLEM (From Lesson 18)

A graphic designer is creating an advertisement for a tablet. She needs to enlarge the picture given here so that 0.25 inches on the scale picture corresponds to 1 inch in the actual advertisement. What will be the length and width of the tablet in the advertisement?



Scale Picture of Tablet

**Using a table:**

	<i>Scale</i>	<i>Length</i>	<i>Width</i>
<i>Picture, x</i>	0.25 in.	$1\frac{1}{4}$ in.	$1\frac{1}{8}$ in.
<i>Actual Advertisement, y</i>	1 in.	5 in.	$4\frac{1}{2}$ in.

**Using an equation:**

**Find the constant of proportionality,  $k$ :**

$$k = 4$$

*(scale factor since units of measure are the same; it is an enlargement)*

**To find actual length:**

$$y = 4x$$

*(where  $x$  represents the picture measurement and  $y$  represents the actual advertisement measurement)*

$$y = 4\left(1\frac{1}{4}\right)$$

$$y = 5$$

**SAMPLE PROBLEM** *(continued)***To find actual width:**

$$y = 4x$$

$$y = 4\left(1\frac{1}{8}\right)$$

$$y = 4\frac{1}{2}$$

**The tablet will be 5 inches by  $4\frac{1}{2}$  inches in the actual advertisement.**Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.**HOW YOU CAN HELP AT HOME**

You can help at home in many ways. Here are just a few tips to help you get started:

- Use a store ad to find pictures of actual items you have in your home (e.g., a refrigerator or a television set). Encourage your child to measure both the picture and the actual item with a ruler or other measuring device. Using these measurements, he can determine whether the picture is a scale image of the actual item. If the picture is a scale image, challenge him to calculate the scale factor.
- Write a journal entry, poem, or rap lyrics with your child to explain the connection between rates, unit rates, proportional relationships, constants of proportionality, scale drawings, and scale factors.
- In preparation for Module 2, challenge your child to write positive and negative numbers in order on a number line. You might also write a variety of positive and negative numbers on index cards (one number per card) and encourage her to order the numbers from least to greatest. Remember to include zero, positive fractions, and negative fractions as options.

**TERMS****Scale drawing:** A reduction or an enlargement of an original object or picture in which the dimensions in the drawing are proportional to the corresponding dimensions in the original object or picture.**Scale factor:** In a scale drawing, the constant of proportionality is called the scale factor. It can be calculated from the ratio of any length in the scale drawing to the corresponding length in the original. Multiply any dimension in the original by the scale factor to determine its size in the scale drawing. A scale factor greater than one makes the drawing an enlargement; a scale factor smaller than one makes the drawing a reduction.