

Lesson 17: The Unit Rate as the Scale Factor

Classwork

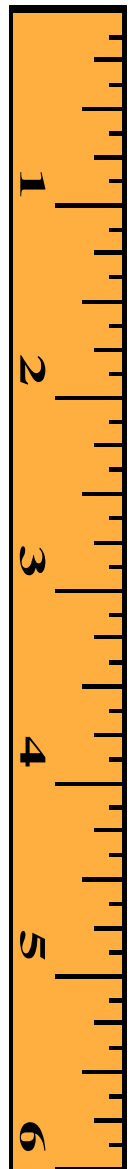
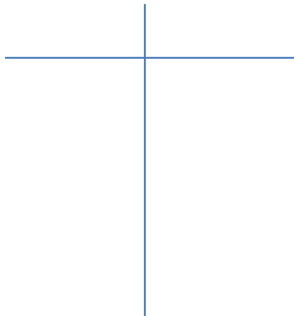
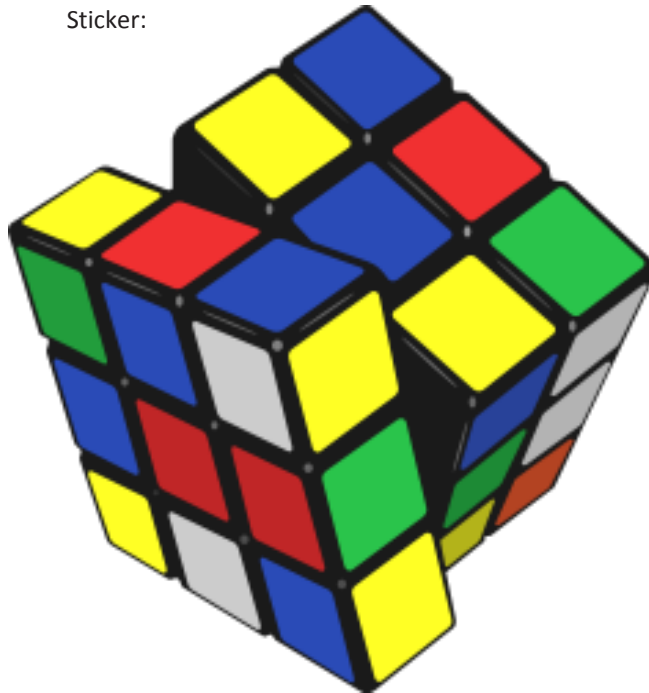
Example 1: Rubin's Icon

Rubin created a simple game on his computer and shared it with his friends to play. They were instantly hooked and the popularity of his game spread so quickly that Rubin wanted to create a distinctive icon, so players could easily identify his game. He drew a simple sketch. From the sketch, he created stickers to promote his game, but Rubin wasn't quite sure if the stickers were proportional to his original sketch.

Original Sketch:



Sticker:



[Type here]

Steps to check for proportionality for scale drawing and original picture :

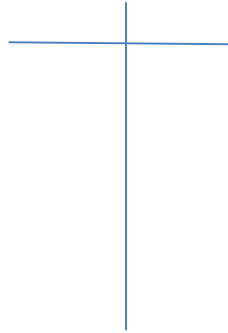
- 1.
- 2.
- 3.

Key Idea:

The **scale factor** can be calculated from the ratio of any length in the scale drawing to its corresponding length in the actual picture. The scale factor corresponds to the unit rate and the constant of proportionality.

Scaling by factors *greater than 1* enlarge the segment and scaling by factors *less than 1* reduce the segment.

Exercise 1: App Icon



[Type here]

Example 2

Use a Scale Factor of 3 to create a scale drawing of the picture below.

Picture of the Flag of Columbia:

**Exercise 2**

Scale Factor= _____

Sketch and notes:

Picture of the Flag of Columbia:



[Type here]

Example 3

Your family recently had a family portrait taken. Your aunt asked you to take a picture of the portrait using your cell phone and send it to her. If the original portrait is 3 feet by 3 feet and the scale factor is $\frac{1}{18}$, draw the scale drawing that would be the size of the portrait on your phone.

Sketch and notes:

Exercise 3

John is building his daughter doll house that is a miniature model of their house. The front of their house has a circular window with a diameter of 5 feet. If the scale factor for the model house is $\frac{1}{30}$, make a sketch of the circular doll house window.

[Type here]

Problem Set

1. Giovanni went to Los Angeles, California for the summer to visit his cousins. He used a map of bus routes to get from the airport to the nearest bus station from his cousin's house. The distance from the airport to the bus station is 56 km. On his map, the distance was 4 cm. What is the scale factor?
2. Nicole is running for school president and her best friend designed her campaign poster which measured 3 feet by 2 feet. Nicole liked the poster so much she reproduced the artwork on rectangular buttons measuring 2 inches by $1\frac{1}{3}$ inches. What is the scale factor?

3. Use a ruler to measure and find the scale factor.

Scale Factor: _____

Actual Picture



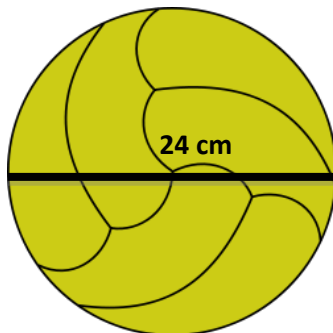
Scale Drawing



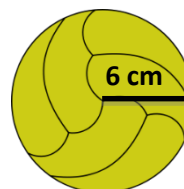
4. Find the scale factor using the given scale drawings and measurements below.

Scale Factor: _____

Actual Picture



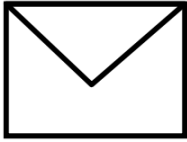
Scale Drawing



[Type here]

5. Using the given scale factor, create a scale drawing from the actual pictures in centimeters:

a. Scale factor: 3



b. Scale factor: $\frac{3}{5}$



6. Hayden likes building radio-controlled sailboats with her father. One of the sails, shaped like a right triangle, has side lengths measuring 6 inches, 8 inches and 10 inches. To log her activity, Hayden creates and collects drawings of all the boats she and her father built together. Using the scale factor of $\frac{1}{4}$, draw a scale drawing of sail.

[Type here]