

# Scaling Away

NAME \_\_\_\_\_

Select an object that is a rectangular prism or a cylinder. Record all of your work below.

Object: \_\_\_\_\_

Shape: \_\_\_\_\_

1. What do you think will happen to the volume when you enlarge a common object by your given scale factor? What do you think will happen to the surface area? Write your **hypothesis**.

*If I multiply each dimension by the scale factor, then I think...*

*the surface area will* \_\_\_\_\_

*and the volume will* \_\_\_\_\_

*because* \_\_\_\_\_.

2. Measure and Record the dimensions of your object. Include the correct units.

Length \_\_\_\_\_ Width \_\_\_\_\_ Height \_\_\_\_\_

– or –

Diameter \_\_\_\_\_ Height \_\_\_\_\_

3. Compute the surface area of your object. Include the correct units.

4. Compute the volume of your object. Include the correct units.

Imagine you are going to enlarge your object by building a scale model. To do this, you will multiply each dimension by a number known as the **scale factor**.

Choose a scale factor (from 3 to 8): \_\_\_\_\_

5. Multiply each dimension by the scale factor, and record the new dimensions below.

Length \_\_\_\_\_ Width \_\_\_\_\_ Height \_\_\_\_\_

– or –

Diameter \_\_\_\_\_ Height \_\_\_\_\_

6. Compute the surface area of the model. Include the correct units.

7. Compute the volume of model. Include the correct units.

8. Determine the ratio of the surface area of the original object to the surface area of the model.

9. Determine the ratio of the volume of the original object to the volume of the model.

**10.** Was your hypothesis correct? Why or why not? Explain what you have discovered about multiplying a side length by a scale factor. What happens to the surface area? What happens to the volume?

**11.** If you had used a scale factor of 8, by what factor would the surface area have increased? By what factor would the volume have increased?