

# Worksheet To Accompany the "Surface Area and Volume" Lesson

This worksheet is intended for use with the lesson Surface Area and Volume.

For the following questions, use the rectangular prism:

1. What is the smallest volume that you can create with this prism?

\_\_\_\_\_

What is the surface area associated with this volume? \_\_\_\_\_

What is the depth? \_\_\_\_\_

What is the height? \_\_\_\_\_

What is the width? \_\_\_\_\_

2. What is the largest volume that you can create with this prism?

\_\_\_\_\_

What is the surface area associated with this volume? \_\_\_\_\_

What is the depth? \_\_\_\_\_

What is the height? \_\_\_\_\_

What is the width? \_\_\_\_\_

3. Explain why the surface area is larger than the volume in #1.

4. Can you make the surface area and volume have the same value? If so, what are the dimensions of the prism at that time? How close can you get?

Are the two values **really** the same (or close to the same) with these

dimensions? Hint: What are the units for each of the values? Are the units the same?

5. Change the rectangular prism so that it is as large as possible in every direction.

In #2, you found that the largest possible volume of the rectangular prism was \_\_\_\_\_.

How do you think the largest possible volume of the triangular prism will compare? Will it be larger or smaller?

How much larger or smaller?

Write your guess and reasoning here and then choose the triangular prism to check it:

6. Was your prediction correct?

Does the same ratio always hold true for triangular and rectangular prisms with the same dimensions?

7. Do the values for the surface area of the triangular and rectangular prisms have the same ratio that you discovered in #5? Why do you think this is true?

8. Let's take a look at how we would calculate the surface area of the triangular prism. Please set all dimensions at 14 units for this exercise:

- Click on View Front. This view looks like a triangle. The base is 14 units and the height is 14 units. Since the formula for the area of a triangle is:

the area of this face of the triangular prism is \_\_\_\_\_.

Please show your work:

- Click on View Side. This view looks like a rectangle that is slanted into the screen. The base is 14, but what is the height?

Can you use the Pythagorean theorem to find the height of this rectangle? Hint: The height of this rectangle is the hypotenuse of a triangle in another view! Show your work:

What is the area of this side of the triangular prism? Show your work:

- Click on View Top. This view looks like a regular rectangle. The area of this face of the prism is \_\_\_\_\_. Please show your work:
- Now, since we have \_\_\_\_ faces that look like View Front, \_\_\_\_ faces that look like View Side, and \_\_\_\_ faces that look like View Top, we can add the area of the 5 faces to get the total surface area. What is it? Show your work: