Lesson 12: From Unit Cubes to the Formulas for Volume

Problem Set

1. Determine the volume of the rectangular prism.
2. The area of the base of a rectangular prism is , and the height is . Determine the volume of the rectangular prism.
3. The length of a rectangular prism is times as long as the width. The height is of the width. The width is . Determine the volume.
   1. Write numerical expressions to represent the volume in two different ways, and explain what each reveals.
   2. Determine the volume of the rectangular prism.
4. An aquarium in the shape of a rectangular prism has the following dimensions: length , width , and height.
   1. Write numerical expressions to represent the volume in two different ways, and explain what each reveals.
   2. Determine the volume of the rectangular prism.
5. The area of the base in this rectangular prism is fixed at . As the height of the rectangular prism changes, the volume will also change as a result.
   1. Complete the table of values to determine the various heights and volumes.

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| Height of Prism (in centimeters) | Volume of Prism  (in cubic centimeters) |
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* 1. Write an equation to represent the relationship in the table. Be sure to define the variables used in the equation.
  2. What is the unit rate for this proportional relationship? What does it mean in this situation?

1. The volume of a rectangular prism is . The height is .
   1. Let represent the area of the base of the rectangular prism. Write an equation that relates the volume, the area of the base, and the height.
   2. Solve the equation for .