

## Section 2.1 – What is a Power?

1) How can you use the side length of a square to calculate its area?

**Multiply the side length by itself:  $1 \text{ unit} \times 1 \text{ unit} = 1 \text{ square unit}$ .**

2) How can you use the edge length of a cube to calculate its volume?

**Multiply the length by the width and by the height:  $3 \text{ units} \times 3 \text{ units} \times 3 \text{ units} = 27 \text{ cubic units}$ .**

3) How could you check your answer?

**You could take the cube apart, and count all the unit cubes. You know there are 9 unit cubes in each layer, and there are 3 layers, so there are  $3 \times 9 \text{ unit cubes} = 27 \text{ unit cubes}$ .**

4) How many tiles would you need to show a square with a side length of 2? **4**

5) Could you use tiles to show an area of 2? **Yes, you could show an area of 2, but it would be a rectangle.**

Complete the Investigation on page 52 then answer the following questions.

6) How did you know what the next square was? **The side length of the square increases by 1 each time. The next square was the next perfect square.**

7) What patterns do you see in your table? **In each row, the number of tiles is equal to the area of the square. The area is the product of 2 side lengths. Side length increases by 1.**

8) How can you tell that you have made a cube? **Its length, width and height are the same.**

9) How did you know what the next cube was? **The edge length of the cubes increases by 1 each time.**

10) What patterns do you see in your table? **In each row, the number of cubes is equal to the volume of the cube. The volume is the product of 3 edge lengths. Edge length increases by 1.**

11) How are the areas and volumes the same?

**A square has two equal dimensions and its area is the product of those 2 dimensions. A cube has 3 equal dimensions and its volume is the product of those 3 dimensions.**

12) How are the areas and volumes different?

**Area is a measure of the amount of surface. Volume is a measure of the amount of space occupied.**

13) How is the area of a square with a side length of 5 units different from the volume of a cube with an edge length of 5 units?

**The area of the square is  $5 \text{ units} \times 5 \text{ units} = 25 \text{ square units}$ ; the volume of the cube is  $5 \text{ units} \times 5 \text{ units} \times 5 \text{ units} = 125 \text{ cubic units}$ . It is also the area of the square  $\times 5 \text{ units}$ , because the volume of a cube is base area  $\times$  height.**