Investigating Surface Area and Volume Using Cells

Answer all questions on this paper (use the back if necessary).

To explore the surface area and volume formulas for a cube, cut out and tape the four two-dimensional versions of cubes into three-dimensional versions.

Now, using the formulas for surface area and volume of a cube, fill out the following for each of the cubes that you constructed:

	Side Length	Surface Area	Volume
Cube 1	2 cm		
Cube 2	4 cm		
Cube 3	1 cm		
Cube 4	3 cm		

1. Compare the first cube to the second cube to find the following ratios (remember to always express ratios in simplest form): a. side lengths; b. surface areas; and c. volumes.

2. Compare the third cube to the fourth cube to find the following ratios (remember to always express ratios in simplest form): a. side lengths; b. surface areas; and c. volumes.

3. Compare the first cube to the fourth cube to find the following ratios: a. side lengths; b. surface areas; and c. volumes.

4. Use your results from numbers 1, 2, and 3 to generalize the ratios of side lengths, surface areas, and volumes you would expect for two cubes with side lengths a and b.

5. Rectangular prisms are similar if their bases are similar and corresponding sides are proportional. For instance, a 1 cm by 2 cm by 3 cm rectangular prism is similar to a 2 cm by 4 cm by 6 rectangular prism because their bases are similar and the ratio of their corresponding sides is 1:2 (it is the same shape). Does your answer to problem 3 still apply to these similar rectangular prisms? Show the surface area, volumes, and ratios to justify your answer.