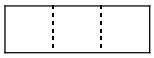
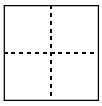
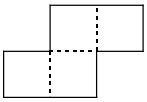
Prisms

1. **Cylinders.** Find two pieces of paper of the same size. (Two index cards or two 8.5" x 11" pieces work well.) Make two cylinders (with no top or bottom): one shorter and squat, and one long and thinner.
    a. Without measuring, discuss how their volumes and surface areas compare.
    b. Put the thin one inside the squat one. Fill up the thin one with beans. Write down what you predict will happen when you pull the thin one out and let the beans spill into the short one.
    c. Try it! Reflect on how this compared to your prediction.

2. **Right Prisms.** In this activity, you will build some right prisms out of cubes. A prism is a shape whose cross-sections are the same. For instance, a cylinder or the triangular prisms people use to make rainbows are all mathematical prisms. Some prisms are tilted. A right prism is one whose cross-sections are stacked in a straight line at a right angle with the cross-sections.
    a. Make an example of each of the following right prisms out of multifix snap cubes and fill out the chart. You should use the edge of a cube as the unit of length, the face of the cube as the unit of area, and the cube itself as the unit of volume.

Base	Height	Area of Base	Volume of Prism	Perimeter of Base	Lateral Surface Area (just the sides)
	4 units				
	6 units				
	3 units				
rectangle with area 6 square units	9 units				
non-rectangular, with area of 6 square units	6 units				

    b. Find some general rules or formulas that show relationships among the measurements studied in #3 above.

3. **Bonus**. You've done some work on the area of circles and the volume of right prisms.
    a. Come up with a plausible formula for the volume of a cylinder.
    b. What is a general formula for the volume of a right prism?
    c. Can you come up with some special examples of **tilted** prisms whose volumes you can figure out?