

## Team Problems for Chapter 11

Name: \_\_\_\_\_

Date: \_\_\_\_\_

### **Problem #1: Cylinder nets**

You will need an 8.5-inch-by-11-inch piece of paper and tape.

1. Roll the paper and tape it along its long edge to make a cylinder.
2. What is the lateral surface area of this cylinder?
3. What is the surface area of this cylinder, **including** the bases? *Find the radius of the base using an algebraic method, NOT by measuring.*

### **Problem #2: Cone nets**

You will need a piece of paper, a compass, a ruler, scissors, and tape.

1. Use the compass to make a circle with a 3-inch radius on your paper. Measure a  $120^\circ$  central angle in your circle, and cut this part of the circle out. Cut out the remaining part of the circle and join the two cut radii with tape to make a cone.
2. What is the lateral surface area of this cone?
3. What is the surface area of the cone, **including** the base? *You may estimate the radius of the base by measuring with a ruler.*

**Problem #3: Volume Problem Solving**

1. How many plastic  $2\text{cm} \times 2\text{cm} \times 2\text{cm}$  cubes can be neatly stacked in an  $8\text{cm} \times 10\text{cm} \times 12\text{cm}$  box? Explain.
2. How many plastic  $2\text{cm} \times 2\text{cm} \times 2\text{cm}$  cubes can be neatly stacked in an  $8\text{cm} \times 9\text{cm} \times 12\text{cm}$  box? Explain.
3. A BerryBombs cereal box is 10 inches tall,  $7\frac{1}{2}$  inches wide, and  $2\frac{1}{2}$  inches deep. Give the length, width, and height of a cardboard box that could hold exactly 12 BerryBombs cereal boxes, leaving no extra space.

**Problem #4: More Volume Problem Solving**

1. A 9-inch-by-9-inch-by-12-inch jar in the shape of a rectangular prism is completely filled with gum balls of diameter  $\frac{3}{4}$  inches. Estimate the number of gum balls in the jar, and explain your reasoning.
2. A jar in the shape of a 9-inch-tall cylinder with a circular base of diameter 6 inches is completely filled with gum balls of diameter  $\frac{3}{4}$  inches. Estimate the number of gum balls in the jar, and explain your reasoning.
3. Do you think your estimates in 1 & 2 are overestimates or underestimates? Explain your reasoning.

**Problem #5: Even More Volume Problem Solving**

Find the volume of the following solids:

