Name: **Date:**

Station Activities: Geometric Modeling

Station 1

At this station, you will find modeling clay. Use the clay to sculpt a cylinder, a cube, a cone, and a sphere.

1. Predict the shapes of all possible cross sections for each object you sculpted. Once a prediction has been made, cut the objects to verify their cross sections' shapes.

Use the given information to complete problems 2–5. Round answers to the nearest tenth.

2. Given a cylinder with a radius of 6 in and a height of 8 in, find the area of a cross section that is parallel to the cylinder's base.

3. A circle has a radius of 16 cm. What is the volume of a sphere that has the same radius?

4. Given a cylinder with a height of 50 mm and a radius of 10 mm, find the area of the rectangle formed by cutting a perpendicular cross section right down the cylinder's center.

5. A square with an area of 400 m^2 is rotated to form a cylinder. What is the volume of the cylinder?

Name: **Date:**

Station 2

Use the given information to complete the problems that follow. Round answers to the nearest tenth.

A canister is approximately 9.25 inches tall. The top and bottom of the canister each have a diameter of 6 inches.

1. Find the approximate volume of the canister.

2. Convert the volume of the canister from cubic inches (in^3) to cubic centimeters (cm^3) using the conversion 2.54 cm = 1 in.

3. If the mass of the canister is 38,250 grams, what is the density of the canister in grams per cubic centimeter (g/cm^3)?

4. Based on this information and the table that follows, what material was likely used to make the canister?

Substance	Density (g/cm^3)
Wood (oak)	0.85
Aluminum	2.7
Copper	8.93
Iron	7.8
Gold	19.3

Name: **Date:**

Station 3

You have decided to start your own business selling homemade candy corn. The candy is packed in a uniquely shaped container, which consists of a cylinder and a top that is in the shape of a cone. The radius of the cylinder is 6 in, and the height of the cone-shaped top is $\frac{1}{3}$ the height of the cylinder.

1. Sketch the container and label its dimensions.

2. What is the equation for the volume of the container in its simplest form?

3. If the volume of the container is 220π in^3, find the heights of the cylinder, the cone, and the entire container.

4. Suppose you have spherical packages of candy corn that each have a radius of 3 in. How many of these spherical packages can you fit in the cylindrical part of the container?

Name: **Date:**

Station 4

Luke wants to create a fenced-in garden with an area of 4,200 ft^2. He wants to use wooden fencing on two sides, and wire fencing on the other two sides; each pair of opposite sides will be made of matching material. The sides with wire fencing will cost \$6.50/ft and the two sides with wooden fencing will cost \$10.50/ft. Find the dimensions of the length and width of the garden that will minimize the cost of the fence.

1. Draw a sketch of the garden and define the variables.

2. If $A = lw$, write the formula for the length in terms of the area and width.

3. The cost C of the fence can be expressed as $C = 6.5(2l) + 10.5(2w)$. Use the expression for l found in problem 2 to simplify the cost equation.

4. Use a graphing calculator to determine the smallest width (or minimum point) in order to find the dimensions (length and width) of the garden.