Name: _____ Class: _____ Date: _____

Calculating the Density of Solid Objects

Learner Outcomes:

- Compare densities of materials; and explain differences in the densities of solids, liquids and gases, using the particle model of matter.

Key Terms:

Solid	Particle model of	Displacement
Liquid	matter	Volume
Gas	Density	Mass

Purpose: To determine the density of various objects using indirect measurement.

Materials:

triple beam balance	graduated cylinder
various solid objects	ruler

Procedure:

1. Measure and record the volume of each object by either measuring its dimensions and calculating the volume, or by "measuring by displacement" using the graduated cylinder.
2. Measure and record the mass of each object.
3. Calculate the density of each object.

Observations:

Substance	Mass (g)	Volume (mL)	Density (g/mL)

Analysis:

1. Explain what two pieces of information you require in order to calculate density.

2. What was the best method for determining volume for a regular shaped object (square or rectangular prism or sphere)? What was the best method for an irregular shaped object?

3. Construct a bar graph to illustrate the densities. The vertical axis will be the density and the horizontal axis will be the substance.

Conclusion: List in order the substances from the greatest to least density.

Extension:

1. Design an experiment to determine the density of a gas.
2. Refer to the lab "Calculating the density of various fluids" and explain how the densities of solids, liquids and gases differ. Explain this difference using the particle theory of matter. You may choose to use diagrams in your explanation.