All Bent Out Of Shape
Concept Development

Problem:

How can the relationship between volume and mass be quantified?

Materials:

metric balance
graduated cylinders
a variety of pieces of an element (wide variety of shapes & sizes)

Procedure:

Determine the mass and the volume of each of the pieces of the material provided. Prepare a data table in which to display this data. Plot all data on a graph using mass as the dependent variable. If you are unable to determine the relationship between the two variables, you may need to collect more data to make the relationship a little more obvious.

Summing Up:

1. Mathematically manipulate your data: Add the mass and volume of your sets of data, subtract the volume from the mass of your sets of data, multiply the mass and volume of your sets of data, and divide the mass by the volume of your sets of data. Be sure to carry the proper units with your calculations and include this information in a data table. Which calculation seems to show a consistent relationship between the two variables as shown on your graph?

2. Look up the equation for density. Would the density of an object depend on its shape, volume, color, or mass? Explain.

3. Use a reference book to help identify the material with which you have been working.