

EXPERIMENT 2**Density****PART I INTRODUCTION**

Purpose: To determine the density of four objects

Locker Check-out**Finding Density**

Purpose: To determine the density of different objects

Procedure and Observations and Data:

1. In this lab you will work in groups of 3. Take the four objects: a rock, a rubber stopper, a marble and a block of wood. In your group and make a hypothesis by ranking the four objects from most dense to least dense based only on visual observation Record this hypothesis below.

Hypothesis 1:

1.
2.
3.
4.

2. Now take the four objects and hold them in your hand. In your group and make a hypothesis by ranking the four objects from most dense to least dense based only on your new observation. Record this hypothesis below.

Hypothesis 2:

1.
2.
3.
4.

3. Measure the mass of each object and record in the data table.

Data Table 1: Complete the table below. Don't forget the units!

Object	Mass

4. You will now measure the volume of each of the objects. Put about 10 ml of water into a graduated cylinder and record the exact initial volume. Gently slide the first object into the graduated cylinder. Be careful not to splash any water out. Record the new volume.

Data Table 2: Volumes

Object	Initial volume of water	Volume of water and object

Volume

Now you are ready to calculate the volume of each of the objects. Discuss with your partner how to best find the volumes of each object. Put the setup of each volume calculation in table 3, and put the answers in table 4. Have the instructor initial your calculation to make sure it is correct.

Table 3: Volume Calculations

Object	Volume calculation

Instructor approval: _____

Table 4: Volumes

Object	Volume

Finding Density

Using the measured masses and volumes calculate the densities of each object. Show the setup for one of for the four calculations in your lab journal. Record all of the results of the four calculations in a table.

Table 5: Calculating Density

Density of rock:
Density of rubber stopper:
Density of wooden block:
Density of Styrofoam ball:

Table 6: Densities

Object	Density

Questions and Answers:

1. Rank the 4 objects in order of the densities you calculated

1.
2.
3.
4.

2. How is the new rank different from the original rank?

3. Explain your theory of why one substance is more dense than another. What causes a substance to have more mass in a certain volume. You might want to do question 4 before question 3.

4. Because atoms and molecules are so small we cannot see them. Even with the best microscopes, we are given a very limited view of molecules. Scientists must resort to indirect evidence to create models of what molecules might look like. This kind of science is like having a “black box” that cannot be opened. That box contains something that, although it cannot be seen, one can use other ways of discovering what is in the box. The box could be shaken or probed etc. Although it is not perfect knowledge, one can get good approximations or models. Density is one way of “probing” at matter. Now you can come up with a model that helps yourself and others see what causes an object to have density. Use your imagination to draw a diagram of what it might look like at the smallest particle level of each of these objects. Draw “Black Box” diagrams into the space below.

Rock	Rubber stopper
Wooden block	Marble

Conclusions and Reflections

What did you learn about density that you did not know before?

What is something from the lab today that helped you understand density a little better?

Can you say you really understand density if you memorize the definition? Explain.
