

Name:

Period:

LAB 10.1: DENSITY OF OBJECTS

BACKGROUND

We have used the Cartesian Diver to develop a better idea of density and its relationship to buoyancy. Whether a diver is positively, negatively, or neutrally buoyant seems to be related to its density. We will further investigate density by determining the densities of several other floating and sinking objects.

PROBLEM

What are the densities of floating and sinking objects?

HYPOTHESIS

independent variable

dependent variable

The predicted relationship between the variables is:

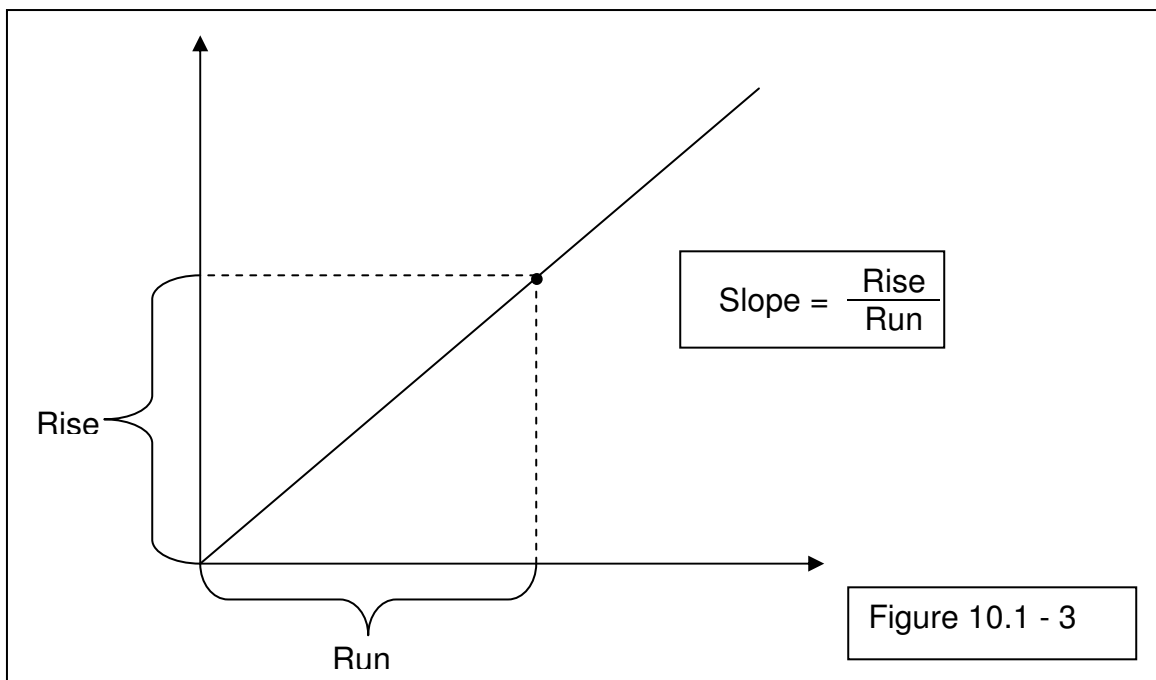
MATERIALS

- ◆ floating objects
- ◆ sinking objects
- ◆ graduated cylinder
- ◆ overflow container
- ◆ beaker (250mL)
- ◆ beaker (600mL)
- ◆ triple-beam balance
- ◆ computer & printer
- ◆ apron & goggles

PROCEDURE

1. Select a floating or sinking object. List it in table 10.1-1.
2. Determine the mass and **total** volume of the object. Record this data in your table.
3. Repeat this process for **several** floating **and** sinking objects. Then clean up your lab station. After your station is cleaned up, you and your lab partner may continue to work together on the remaining steps.

4. Using a computer, graph the data of the floating and sinking objects.
 - a. Start by graphing the mass on the Y-axis and the total volume on the X-axis. (*Note, this is different from how we usually do it*).
 - b. Print your graph to the appropriate printer
 - c. Create a *density line* for each object.
 - i. Draw a straight line from the origin through the point.
 - d. Determine the *slope* of each density line.
 - i. The slope can be determined by dividing the *rise* of the line by the *run*. (See figure 10.1-3)
5. Calculate the density for each object by dividing the mass of the object by the total volume of that object. Record your results in table 10-2.



DATA

Table 10.1-1: _____		
Object	Mass (____)	Total Volume (____)

You may choose to verify your data with Mr. Koerger.

Table 10.1-2: _____		
Object	Slope of Line (____)	Calculated Density (____)

SUMMARY

Summary and Challenge Questions must be typed on a separate piece of paper.

1. Finish steps 4 & 5 of the procedure above.
2. What can you say about the values of densities of floating objects?
What about the densities of sinking objects?

CHALLENGE

1. Do different liquids have different densities?
2. How might you determine the density of a liquid?