

Name: _____ Date: _____ Period: _____

Determining the Density of Different Things

Background

In ordinary speech we are likely to say that lead is "heavier" than wood, or that a stone is "heavier" than water. A little thought reveals that these terms are not accurate. After all, a tree is heavier than a bullet and a pail full of water is heavier than a pebble. What we really mean is that a piece of lead is heavier than a piece of wood of the same size (volume).

The term density is used to describe the relationship between mass (weight) of an object and its volume. Density is the ratio between mass and volume:

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

Under given conditions of temperature and pressure, the density of a substance is always the same. Density is one of the characteristics by which a substance can be identified. It is more accurate to say that lead is denser than wood and rocks are denser than water.

Objective

Calculate the mass, volume, and densities of both regular and irregular shaped objects.

Define the following terms:

Mass:

Volume:

Density:

Write the formulas for the following properties:

Area:

Volume:

Density:

Data and Observations: You must include units or its wrong!

Cube 1		Cube 3	
Length		Length	
Width		Width	
Height		Height	
Mass		Mass	
Density (show all work)		Density (show all work)	
Cube 2		Cylinder	
Length		Mass	
Width		Volume	
Height		Density (show all work)	
Mass			
Density (show all work)			

Object:		Object:	
Mass		Mass	
Volume		Volume	
Density		Density	
Object:		Object:	
Mass		Mass	
Volume		Volume	
Density		Density	
Liquid:		Liquid:	
Mass of empty graduated cylinder		Mass of empty graduated cylinder	
Mass of full graduated cylinder		Mass of full graduated cylinder	
Volume		Volume	
Density		Density	

Questions (must be answered in full and complete sentences or you will receive no credit)

1. What measurements do you have to do in order to calculate density?
2. What effect does size or shape have on density of the same material?
3. Why do you need to use the water displacement method for some objects and not for others?
4. Water has a density of 1 g/ml. If an object has a density of less than 1 g/ml will it sink or float?
5. What object in this lab would float on water?
6. What would happen to the density of a substance whose mass was cut in half?
7. What procedures would you do if you wanted to calculate the density of an unknown substance?

8. Determine the volume of a substance whose mass is 35 g and the and has a density of 5 g/ml.
Show your work

9. Determine the mass of a substance whose density is 3.5 g/ml and has a volume of 140 ml. Show your work