

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Density

Purpose: To use density as a means for determining the composition of a variety of unknown substances.

### Materials:

Assorted objects that are regularly and irregularly shaped and of differing compositions

### Equipment:

balance

graduated cylinder

ruler

### Procedure:

Describe the differences in measuring volume for blocks and irregularly shaped objects.

### Data:

Object (letter)	Mass (g)	Length (cm)	Width (cm)	Height (cm)
Y	285.74	4.12	2.53	3.07
Z	71.25	2.85	3.11	2.98
AA	245.73	3.12	3.18	3.03

Object (letter)	Mass (g)	Initial Volume (mL)	Final Volume (mL)
Y (cylinder)	124.75	40.0	57.5
Y (sphere)	284.71	30.0	72.0
Z (cylinder)	391.24	27.0	61.5
Z (sphere)	52.69	30.0	49.5
AA (cylinder)	101.85	30.0	44.0
AA (sphere)	247.82	50.0	79.0

When finished with the experiment, make sure the data table on the webpage is completed.

### Analysis and Discussion:

All necessary calculations for volume and density must be submitted (with work) on separate paper. Furthermore, a brief discussion of how you determined the composition of each unknown should follow. Some unknowns may require greater explanation than others.

### Report (handwritten on a separate sheet of paper):

Title

Procedure – as described above

Data – please fill out the webpage ([Students](#) – login – scroll down to Labs – Density)

Analysis – Show all of the calculations necessary to find volume and density.

Discussion – Identify the unknown objects based on their density. Furthermore, speculate as to how the following situations could affect the measurements (and therefore volume and density calculations):

- When measuring the dimensions of one of the blocks you notice it has several chipped and rounded corners.
- When using water displacement to determine the volume of a cylinder, water splashes along the inside and outside of the graduated cylinder.
- One of the spheres has a noticeable amount of scratches where it appears that rust has formed.
- One of the blocks has a hook attached to the top that appears to be a different color than the rest of the block.