

Name ~~\_\_\_\_\_~~

Date

10-19-11

13/15

# The Mystery Object

For this activity, you will work **by yourself** to investigate a mystery object. You will use your measurement skills, your knowledge of density, and a data table to determine the substance that makes up your mystery object. Your performance on this activity will show how well you can apply the concepts, knowledge, and skills you have learned in the first part of this unit. You are not to share information or procedures that you follow with any of your classmates. This 15-point activity will count as a quiz grade.

1. Make sure you have the following materials: graduated cylinder, beaker, ruler, double-eye loupe, mystery object, access to water, access to an electronic balance
2. Use any of the apparatus to identify the substance that makes up your mystery object. **Your object is made from one of the substances in Table 9.1.** You may not need to use all of the apparatus. You may refer to your science folder, but do not discuss your work with other students. Points will be given for accurate measurements and calculations and for the representation of your results.
3. Write down the letter of your mystery object. F
4. Write up a list of procedures describing how you are going to discover the identity of the substance that makes up the mystery object. If it helps you, you can draw pictures of what you are going to do and then describe what you have drawn.

\* Find the Mass of the object by weighing it on the scale,

\* Find the volume by measuring the difference in mL in the graduated cylinder.

Divide it from mass and find density.

(Use this to ~~Identify~~ Identify mystery object!)

5. Write the results of any measurements you made, using the appropriate units.

density = 5.325  
 Mass = 42.6 g  
 Volume = 8 mL  
 V (water) = 90 mL  
 V (water + item) = 98 mL  
 $\frac{42.6}{90} = 0.473$   
 $\frac{42.6}{98} = 0.435$

6. Clearly show all your calculations, using appropriate units.

7. Use the information in Table 9.1 below to find out the identity of the substance that makes up your mystery object.

Table 9.1 Approximate Densities of Materials at Room Temperature

Name of Substance	Approximate Density (g/cm <sup>3</sup> )
Polyvinyl chloride (PVC)	1.5
Steel Alloy	7.1
Aluminum	2.7
Sulfur (rhombic)	2.1
Nickel	6
Steel	7.9
Lead	11.4
Copper	8.9
Nylon	1.2
Water	1.0

5.325

My mystery object is made of NICKEL  
 - 2 steel