

Name: _____

Density Rainbow - Finding the Density of Colored Liquids

Materials:

Five small cups labeled A through E
cylinder filled with different substances.

One tall, clear 100 mL graduated
One 25 mL graduated cylinder

Scale or balance

Procedure:

1. Calculate the density of liquid A.
 - a. Use the triple beam balance to first find the mass of the 25 mL graduated cylinder.
 - b. Measure 15 mL of liquid A into the cylinder and find the **mass of the liquid**.
 - c. Write the mass and volume on the chart below and calculate the density.
2. Pour your sample of liquid A into the tall, clear graduated cylinder. Save this cylinder with liquid A in it, because you will later add the others to it.
3. Rinse out your 25 mL graduated cylinder before measuring 15 mL of liquid B.
 - a. Use the triple beam balance to find the mass of liquid B (just as before).
 - b. Write the mass and volume on the chart on the back and calculate the density.
4. Before pouring liquid B into the 100 mL cylinder with liquid A, make a prediction on where liquid B will go—on top or on bottom?

5. Do the same procedure for liquid C. First find the mass, volume and density.
6. Make a prediction on where liquid C will go. _____
7. Test this prediction by **carefully and slowly** pouring liquid C down the tilted side of the graduated cylinder.
8. Do the same procedure as before with liquid D and E. Prediction for D?
_____ Liquid E? _____
9. Finish the table by putting the liquids in number order, 1 being the bottom layer and 5 being the top layer.

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Density Data Table

Liquid	Layer Prediction	Volume	Mass	Density	Layering Order
A Water with green food coloring					
B Vegetable Oil					
C Liquid Soap					
D Corn syrup with purple food coloring					
E Rubbing alcohol with red food coloring					

10. What is the relationship between a liquid's density and its order of layering?

11. In this activity, you used nearly equal volumes of each liquid (about 15 mL of each). What do you think would happen if you used different volumes? For example, if you used 30 mL of liquid B and only 10 mL of liquid A?

12. Try this in a different graduated cylinder. Measure 10 mL of liquid A and add it 30 mL of liquid B. What happened? Use your knowledge of density to explain why.

13. Dispose of the liquids in the layered graduated cylinders by pouring them into the designated container. Use the brush to clean out your graduated cylinder and wipe down your table.