

Lab: Buoyancy

Question (2pts)

What factor determines whether objects float or to sink? (2 pts)

Procedure

Measuring density of liquids.

1. Measure the mass of a 10 mL graduated cylinder (GC) with a balance scale and record the value in the table below.
2. Pour exactly 10 mL of one of the liquids into the graduated cylinder and record the mass of the graduated cylinder and the liquid in the table below. Be sure to measure the volume from the bottom of the meniscus and at eye level.
3. Calculate the mass of the liquid and the density of the liquid in the table below.
4. Repeat for the other liquids.

Measuring the density of regular-shaped solids.

1. Measure the approximate width, length, and height for one ice cube and record in the table below.
2. Measure the mass of the ice cub on the balance scale and record in the table below.
3. Calculate the density of the ice in the table below.
4. Repeat for 2 additional ice cubes and compute the average density of ice.

Data (10 pts)

Liquids

Substance	Mass of GC (g)	Mass of GC + Liquid (g)	Mass of Liquid (g)	Volume of Liquid (mL)	Density of Liquid (g/mL)
Water (green)					
Rubbing Alcohol (blue)					
Vinegar (yellow)					

Solids (ice)

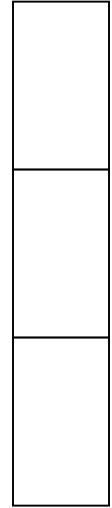
Trial	Mass (g)	Volume (mL)	Density (g/mL)
1			
2			
3			
		Average Density	

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Analysis (3 pts)

Based on the densities that you calculated for each substance, label which liquid would be at the top, middle, and bottom in a graduated cylinder. Furthermore, draw an arrow to indicate where you think the ice cube will be in the graduated cylinder.

After you have drawn your prediction on the right, pour the liquids in carefully to see if your densities are correct. If the liquids mix, try to switch the order until you get 3 visible layers. Once you have 3 layers you may add a small piece of ice.



Conclusions (10 pts)

1. Did you correctly predict which liquid should be on the top, middle, and bottom? Why or why not?
2. Which method is more accurate in determining the relative densities of the liquids? Measuring with a balance and graduated cylinder or by creating layers in the graduated cylinder. Why?
3. Which method is more accurate in determining the actual densities of the liquids? Why?
4. Are the density measurements more accurate for the liquids or for the solid ice? Explain.