slow drips

...adapted from **FLOATING & SINKING #09**
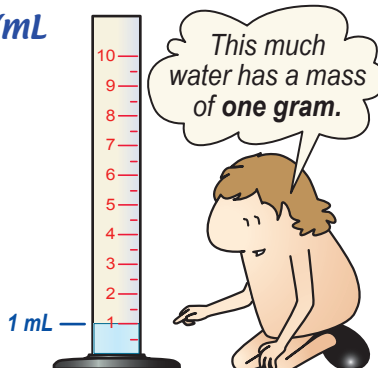by TOPS Learning Systems

1. Fill a large test tube or a tall, narrow jar nearly full with cooking oil. Float an ice cube on top.

2. Watch carefully as the ice melts. Record what you observe.

3. The density of ice and the density of water are different. Which do you think is more dense? Why?

4. One gram of water occupies a **volume** of one milliliter.

Density of water = 1 g/mL

a. What is the **mass** of 10 mL of water? Use a balance to show your answer is correct.

b. How do you think the mass of 10 mL of cooking oil will compare to 10 mL water? Predict, then experiment.

*This much water has a mass of **one gram**.*

1 mL —

OBJECTIVE

To compare the relative densities of ice, water and cooking oil by observing what floats and what sinks. To confirm these observations on a balance.

LAB NOTES

Photocopy the lab for each student or team.

The relative densities of solids and fluids become quickly apparent when observing their floating and sinking characteristics. If you see wood floating on water, for example, while a helium balloon is rising overhead, you can conclude that water is more dense than wood, which is more dense than air, which is more dense than helium.

MATERIALS

• A narrow jar, or a large test tube with a rack or lump of clay to stand it upright.

• Cooking oil (we used corn oil) and water.

• An ice cube or chip that fits into your container.

• A 10 mL graduated cylinder. (This can serve as the container in step 1.)

• A gram balance (*TOPS book #05 Weighing allows students to build a balance that will serve here.*).

ANSWERS

2. Water drops run off melting ice, fall through the oil, and collect at the bottom of the jar.

3. Liquid water is more dense than ice because water sinks, while ice floats.

4a. If 1 mL water has a mass of 1 gram, then 10 mL water must have a mass of 10 grams. (Students should confirm within the limits of experimental error that this is so.)

4b. Ten mL oil would have less mass than the same amount of water, because higher-density water sinks through the lower-density oil. (A balance confirms that 10 mL of corn oil has a mass of 9.1 g, less than 10 mL of water at 10 g.)

EVALUATION

Q: A wood block sinks in kerosene and floats in water. Fill in these blanks: _____ is most dense, _____ is less dense, and _____ is least dense. **A:** *Water, wood, kerosene*

EXTENSION

Find the densities of additional liquids, such as saturated salt water, rubbing alcohol, baby oil...

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