Floating and Density
Pre-Lab Activity - Teacher Guide
Grades – K & 1

Overview
This activity demonstrates the density of 2 different liquids and objects that will float in each liquid.

Materials for each group
** For this activity we suggest that your class be divided into small groups of 3 to 4 students per group. Each group will need the following items:

- Glass jars or containers (at least 18 oz.)
- 1 Cup of vegetable oil (can use colored lamp oil as well)
- 1 Cup of water
- Penny
- Lego block
- Plastic insect or spider that is very light in weight
- Paper towels (in case of spills)

- For assessment purposes you will take one of the group's jars to the front of the room. You will need to have one set of 3 different objects (your choice) with different densities.

In addition to the above listed materials each student will need a Response Paddle (see page 4). Students can create their own paddle or it can be premade (by yourself or a parent volunteer). To create the paddles you will need:

- SINK / FLOAT sheet (page 4) – one per student
- Craft sticks – one per student
- Glue

Getting Ready
A response paddle with the terms SINK/FLOAT needs to be created for each student. The SINK/FLOAT cards needs to be printed (1 per student). You can cut them out and glue them back-to-back with the craft stick in the middle or have the students assemble them the day before the demonstration. This will give the glue time to dry.

Before the students are going to do the experiment, you need to prepare the glass containers. Pour one cup of water into each glass container. Carefully pour the 1 cup of cooking oil on top of the water.

Procedure

Place one container with the oil and water on each table for each group of students. Ask them to tell you what they observe. Ask students to guess what the two liquids are that they see in the container. Ask students if they know why they are separated and not mixed together.

Explain that the reason the liquids are separated is because of something called density. Share examples of things that are the same size but one thing may be heavier than the other thing. Examples could be a donut versus a bagel, a pencil versus a straw, a rock versus a piece of Styrofoam.

Density is when you take the parts that make up the item (molecules) and squash them altogether in the same amount of space (volume). Some things will be heavier than others. What you see going on with the liquids is that one is more dense (molecules squashed together tighter) than the other liquid. Ask which one is more dense (heavier), the oil or the water.

Now that the students understand that liquids can float on top of each other, ask them to make predictions about each object on their tables, one object at a time. Will the objects float or sink? Will they maybe float in one liquid but sink in another? After they have made their predictions, have each student illustrate on a sheet of notebook paper what he/she thinks the specific object will do when dropped into the liquids.

Now that their predictions are recorded, have each team of students take turns to CAREFULLY drop the items into the container. It does not matter the order of the items that they drop into the liquids. It may be interesting to have teams drop the items in different order so they can see the order doesn't have anything to do with whether they float or sink. After each object is dropped into the liquid, it stays in the liquid until the experiment is finished. When the experiment is concluded the objects may be retrieved.

Explanation

All objects have density. The liquids have different densities and that is why the oil floated on top of the water. It was not as heavy as the water. The objects the students dropped into the liquids have different densities as well. The penny was more dense than both the liquids, which is why it sank to the bottom of the container. The Lego block sank through the oil but floated on top of the water. This means it was denser than the oil but not as dense as the water. The plastic spider (or bug) was not as dense as the oil so it floated on top of the oil.

Assessment

To determine if the students understand this concept, do one last demonstration in the front of the classroom. Have 3 **DIFFERENT** objects with different densities (similar to the plastic spider (bug), Lego block, and penny). Show each item to the students and have them give a prediction on whether it will float or sink. They can hold up the SINK or FLOAT paddles assembled before the lab started. Drop each item into the container, asking for a prediction with the paddle cards FIRST. Do not retrieve the object before dropping the next object. Leave all objects in the liquids until demonstration is over. Then the objects may be retrieved and cleaned.

FLOAT

SINK

Examples of what the response will look like attached to the craft stick.

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