

Science

Liquid Densities

Purpose:

- Create a small “lava light” and glitter globe
- Make scientific observations
- Learn that different liquids can have different chemical densities
- Demonstrate that science is fun

Scientific Observations:

Science is based on observations in nature. An observation is something you notice by using your sense of hearing, sight, smell, touch, or taste. Because observations are made by people and people can make mistakes, sometimes an observation can be incorrect. For example, an optical illusion can fool your senses, causing an incorrect observation. If an observation can be repeated with additional experiments or if several other scientists make the same observation, we can be more confident that the observation is valid. During the following activities, you will be making many scientific observations. You may want to share your findings with other participants before answering the discussion questions.

Activity 1: Creating a Lava Light

Supplies (for each participant):

- Newspaper or plastic to protect work area
- Clear glass jar or drinking glass
- Food coloring
- Water
- Vegetable oil
- Salt

Work individually. Cover work surface with newspaper or plastic. Pour about 3 inches of water into a jar or drinking glass. Next, pour 1/3 cup of vegetable oil into the jar or glass and observe the liquid layers. Add one drop of food coloring into the jar or glass and observe. Sprinkle salt slowly into the jar or glass and observe what happens to the salt.

Discussion:

1. Scientists have found that a drop of oil is lighter than a drop of water. Another way to describe this relationship is that oil is less dense (or has a lower density) than water. In your “lava light,” which liquid was the top layer? Which formed the bottom layer?
2. When the drop of food coloring was added, was the drop in the oil or water? Did the color spread?
3. What happened when salt was added? Is salt more or less dense than oil and water?
Scientific explanation: Because salt is more dense than oil and water, it sinks to the bottom, carrying a drop of oil with it. When the salt dissolves in the water, it releases the drop of oil which floats back up to the oil layer.

Activity 2: Creating a Glitter Globe

Supplies (for each participant):

- Newspaper or plastic to protect work area
- Clear plastic container or jar with tight fitting lid (experiment with interesting jar shapes)
- Vegetable oil
- Rubbing (isopropyl) alcohol

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2 activities for grades 3-6. Allow 60 minutes. Science Standard - Investigation/Physical Science
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- Food coloring
- Small shiny objects such as sequins, glitter, beads (do not use anything too heavy that could break the jar when shaken)
- Clear tape

Work individually. Cover work surface with newspaper or plastic. Fill 1/4 of the container with rubbing alcohol. Add a drop of food coloring to the rubbing alcohol. Pour vegetable oil into the container until about 1/2 inch of air remains at the top. Allow the layers to settle and observe the liquid layers. Add small shiny things and top off the container with more oil. Tightly cover with lid and tape around the lid to prevent leakage. Now this is a glitter globe to take home. Gently shake the container and observe what happens. Allow the oil to settle for 5-10 minutes and then spin the container instead of shaking. Make scientific observations.

Discussion:

1. When the vegetable oil is added to the alcohol in the container, what happened? Which liquid has a lower density? Which has a higher density?
2. What happened after shaking the glitter globe? After spinning?

