Lava Lamps

WHAT YOU'LL NEED

- ❑ Clear bottles with caps (preferably plastic)
- ❑ Food coloring
- ❑ Vegetable oil
- ❑ Water
- ❑ Salt
- ❑ Fizzy antacid tablets, such as Alka-Seltzer (optional – for bubbling lava lamps)

WHAT TO DO

Remember: The purpose is NOT to teach a specific topic but to help children experience the excitement of **science exploration!**

GETTING READY

You may want to do a sink/float activity before doing this activity. Consider prefilling the bottles prior to the experiment for young children. If available, have a traditional lava lamp for demonstration.

LET'S GO

*What do you **predict** will happen when you mix water and oil?*

1. Fill the bottle about 3/4 full with oil.
2. Fill the rest of the bottle with water almost to the top.
3. When everything settles, have the children **observe** the oil. *Why do you think the oil floats on top of the water and doesn't sink? (optional) Put equal amounts of water and oil in cups on each end of a balance and see which is heavier.*
4. *What do you **predict** will happen when you add food coloring?* Add one drop of food coloring at a time. Dark colors work best to see that the food coloring colors only the water, not the oil. Have the children **observe**. *Why do you think the food coloring mixes only with the water and not with the oil?*
5. *What do you **predict** will happen when you add salt?* Shake salt on top of the oil slowly. Have the children **observe** what happens. Add more salt to keep the action going if desired. *What happened when the salt was poured on the oil?*

TALK IT OVER

Why do some things sink and others float?

*How can you **predict** if something will sink or float?*

Do all liquids weigh the same?

GOOD TO KNOW

- For a bubbling lava lamp, do not use salt. Divide fizzy tablet into eight pieces instead.

  *What do you **predict** will happen when you add the fizzy tablet?*

- Drop one of the tiny fizzy tablet pieces into the oil and water mixture. **Observe.** When the bubbling stops, add another chunk of tablet.

  What happened when the fizzy tablets were dropped in?

  What happens when you shake the bottle?

THE SCIENCE BEHIND IT

Oil floats on the surface of the water because water is denser than oil. Water molecules are polar molecules. Polar molecules have a partial charge on each end, like a magnet. Food coloring, soda pop and tea are all water-based and made of polar molecules. Polar molecules can mix. Oil molecules are nonpolar molecules, which do not have a partial charge. When you shake the bottle, the oil breaks up into small drops but does not mix with the water. Salt is denser than water, so when you pour salt on the oil, it sinks to the bottom of the mixture, carrying a blob of oil with it. In the water, the salt starts to dissolve. As it dissolves, the salt releases the oil, which floats back up to the top of the water.

The fizzy tablet reacts with the water to make tiny bubbles of carbon dioxide gas. These bubbles attach themselves to the blobs of colored water and cause them to float to the surface. When the bubbles pop, the color blobs sink back to the bottom of the bottle.

Things that are denser than water will sink. Even though oil and water are both liquids, Chemists call them “immiscible liquids.” “Immiscible” simply means that they don’t mix.

RESOURCES

- Your local university Extension office – http://msue.anr.msu.edu/county.
- Science Blast website – http://4h.msue.msu.edu/programs/science_technology/science_blast.
- Exploratorium – http://www.exploratorium.edu/science_explorer/volcano.html.
- Steve Spangler website – http://www.stevespanglerscience.com/.
- MSU Extension – http://msue.anr.msu.edu/news/explore_science_principles_with_a_homemade_lava_lamp.

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