

# A STEM in the Park

## Take Home Activity

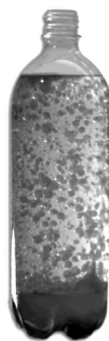
# STEM

## in the PARK

Science, Technology, Engineering, and Mathematics

# Blobs in a Bottle: The World's Easiest Lava Lamp

*(Activity modified from Science Bob found at [www.sciencebob.com](http://www.sciencebob.com))*



### **What You Need**

- A clean 1 liter clear soda bottle [or 16 -20 oz. water bottle, test tube, etc.]
- 3/4 cup of water [or roughly 20% of volume of bottle]
- Vegetable Oil
- Fizzing tablets [such as Alka Seltzer or cheaper "off" brand]
- Food coloring

### **What To Do**

1. Pour the water into the bottle.
2. Use a measuring cup or funnel to slowly pour the vegetable oil into the bottle until it's almost full. Tip the bottle to a slight slant to pour in the oil more effectively (decrease mixing). You may have to wait a few minutes for the oil and water separate (goal is to see two complete layers).
3. Add 5 -10 drops of food coloring to the bottle (we like red, but any color will look great.) The drops will pass through the oil and then mix with the water below. Tap the bottle if the food coloring drops do not drop to the water level.
4. Break a seltzer tablet in half (or quarters for smaller containers) and drop a piece into the bottle. Watch it sink to the bottom and let the blobby greatness begin!
5. To keep the effect going, just add another tablet piece. For a true lava lamp effect, shine a flashlight through the bottom of the bottle. AWESOME!

**Continued on back**

## Observe...

Observe the blobs in the bottle. What is the rate of blob formation (How might you determine this)? Are all the blobs the same size and same shape?

## Investigate...

The project above is a DEMONSTRATION. To make it a true SCIENCE EXPERIMENT, try to answer these questions! For your TEST bottle, be sure to keep everything the same as above except for the ONE thing you are interested in studying (temperature, type of bottle, cap on/off, etc.) and always compare back to the CONTROL bottle (bottle set up as described above).

1. Does the temperature of the water affect the reaction?
2. Does the size of the bottle affect how many blobs are produced?
3. Does the effect still work if the cap is put on the bottle?
4. Does the size of the tablet pieces affect the number of blobs created?

What other questions could you investigate at home?

## Investigate...

At the beginning, the oil stays above the water because the oil is lighter than the water or, more specifically, less dense than water. The oil and water do not mix because of something called "intermolecular polarity." That term is fun to bring up in dinner conversation. Molecular polarity basically means that water molecules are attracted to other water molecules. They get along fine, and can loosely bond together (drops.) This is similar to magnets that are attracted to each other. Oil molecules are attracted to other oil molecules; they get along fine as well. But the structures of the two molecules (oil and water) do not allow them to bond together (they don't get along at all)! Of course, there's a lot more fancy scientific language to describe density and molecular polarity, but maybe now you'll at least look at that vinaigrette salad dressing in a whole new way.

When you added the tablet piece, it sank to the bottom and started dissolving and creating a gas (gas production is a sign that a chemical change is happening)! As the gas bubbles rose, they carried some of the colored water with them. When the blob of water reached the top, the gas escaped and down went the water.

Cool, right? By the way, you can store your "Blobs In A Bottle" with the cap on, and then anytime you want to bring it back to life, **just add another tablet piece!**

***This activity is brought to you by the BGSU Middle Childhood Science Pre-service Teachers (Dr. Jodi Haney, Professor).***