

## SCIENCE FESTIVAL FACILITATOR'S GUIDE



### BEFORE THE EVENT

#### Bubbling Lava Lamp

##### 1. Make sure you have the materials you need.

- Plastic table cover and paper towels to wipe up spills
- Clear plastic bottles with caps (one for each adult-student pair)
- Permanent markers
- Pitcher(s) of water
- Vegetable oil (several containers)
- Food coloring
- Effervescent antacid tablets (one for each adult-student pair) *Note: Bayer Alka Seltzer Gold works really well!*

**NOTE:** Do not pour the used oil/water down the drain the oil can clog sewer systems.

##### 2. Watch this video on your smartphone:

<https://youtu.be/SkKoXOHZydg>

##### 3. Prepare your station.

- Cover your table with plastic to protect it from spills.
- Fill pitchers with water.
- Distribute permanent markers and bottles of food coloring around the table.
- Have several bottles of vegetable oil handy for students to pour into their bottles. (If you have a large jug of oil, pour into smaller cups so it's easier for students).

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## DURING THE EVENT

### Questions to ask participants before they start:

- Have you ever tried to wash a really oily dish?
- Does it come clean easily?
- Why do you think that is?

### Instructions:

Please read each set of instructions out loud. Make sure that you direct the correct person to complete each assigned task.

- **Adult:** Help your student draw a line about  $\frac{1}{4}$  of the way from the bottom of the bottle.
- **Student:**
  - Pour water into the plastic bottle up to the  $\frac{1}{4}$  line.
  - Pour in vegetable oil until the bottle is nearly full. Leave at least 1 inch of space at the top. (Adult can help if needed)
  - Wait until the oil and water have separated.
  - Add about 10 drops of food coloring to the bottle (choose any color you like).
- **Adult:** Break an effervescent antacid tablet into five or six smaller pieces and drop one of the pieces into the bottle. When the bubbling stops, add another piece of the tablet. Repeat as necessary.
- **Student:** When the tablet pieces are used up, and the bubbling has completely stopped, screw on the cap. Tip the bottle back and forth, and watch the wave appear. Enjoy the show!

### How It Works:

Oil and water do not mix. The oil and water separate in the bottle, with oil on top because it has a lower density than water. The food coloring falls through the oil and mixes with the water at the bottom. The antacid “fizzy” tablet creates bubbles of carbon dioxide which is a gas and is less dense than both oil and water so it will move to the top and bring some of the colored water with it.

### Vocabulary:

**Intermolecular polarity:** Water molecules are attracted to other water molecules; oil molecules are attracted to other oil molecules. The structures of the two molecules do not allow them to bond together.

**Density:** Describes how much space an object or substance takes up (its volume)

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in relation to the amount of matter in that object or substance (its mass). If an object is heavy and compact, it has a high density. If an object is light and takes up a lot of space, it has a low density.

### **Real-World Application:**

When oil spills in the ocean, it floats on water, spreads out and forms a “slick.” This oil slick can coat and damage birds who dive for food, as well as destroy beaches and other homes for coastal animals. Understanding density and polarity is essential for people who help clean up oil spills and care for the animals.

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