

# SCIENCE FROM HOME

## LAVA IN A BOTTLE

### Instructions:

#### Procedure version 1:

1. Fill your container about  $\frac{1}{2}$ - $\frac{3}{4}$  full of oil
2. Add water so that there is about 1" (2.5cm) at the bottom of the container
3. Add food coloring if desired
4. Add the effervescent tablet and watch what happens!

#### Procedure version 2:

1. Fill your container about  $\frac{1}{2}$ - $\frac{3}{4}$  full of oil
2. Add water so that there is about 1" (2.5cm) at the bottom of the container
3. Add food coloring if desired
4. Add a few tablespoons of vinegar
5. Add a teaspoon or two of baking soda and watch what happens!

### Questions:

Why don't oil and water mix?

What causes the droplets to rise through the oil then fall?

### How it works:

Lava is molten (liquid) rock that is pushed to the Earth's surface. We can use the principles of density and hydrophobicity to make a chemical reaction look like a volcano trapped in a bottle. When sodium bicarbonate reacts with an acid water and carbon dioxide gas are formed. In the experiment below, the gas is trapped in water molecules but rises through the oil, taking the water with it, because carbon dioxide is much less dense than oil.

### Going beyond:

Does the temperature of the water affect the reaction?

What happens if you change the size or shape of the container?

What other acids can you try this reaction with?

### Materials:

Glass jar, bottle or another container  
(Taller is better!)

Oil

Water

#### Version 1:

Effervescent antacid tablet

#### Version 2:

Vinegar

Baking soda

#### Optional:

Food coloring

### Key terms:

Density

Hydrophobic

Inert



ACADEMIC