



Chemical Lava Lamp

In this package you'll find an engaging activity that you can do at home using materials found around your house! This activity focuses on two concepts: the interactions of different liquids and density. We hope you enjoy the activity and are awed, inspired and enlightened. This activity will require adult supervision.

PROGRAM BASICS

1. MIX IT UP

(Time: 20 minutes)

Children will test the ways that oil and water interact when combined. They will explore the concept of

2. LAVA LAMP

(Time: 15 minutes)

Children will observe that oil and water have different density, oil is less dense than water. They will also observe that antacid tablets react with water but not oil. They can observe that air has less density than both oil and water and will rise to the surface.

IMPORTANT CLEAN-UP NOTE:
DO NOT POUR OIL DOWN THE DRAIN, IT CAN CAUSE SERIOUS CLOGS.
YOU MAY POUR OIL INTO YOUR GREEN BIN IN MOST MUNICIPALITIES.

CURRICULUM CONNECTIONS – SCIENCE AND TECHNOLOGY

Grade 2

Students will investigate through experimentation the interactions of liquids and liquids (oil and water) and liquids and solids (water and antacid tablet).

Grade 5

Students will observe the commonly found states of matter (solids, liquids and gasses) and the characteristics of each. They will observe the difference between physical change (reversible) and chemical change (irreversible).

MIX IT UP

(Activity Time: 20 minutes)

Children will test the ways that oil and water combine and remain separated.

Materials

- Vegetable oil
- Water
- Food colouring
- Plastic cups
- Shallow dish
- Spoon or popsicle stick
- Jar with a lid

Pre Activity Set Up

Pour ~2 inches of water and oil into each plastic cup. Wear clothes you don't mind getting dirty and set up a tablecloth or a tray that you can experiment on without worrying about spills.

Instructions

Introduction

Begin by naming each of the two liquids to the child. Allow the child to add a few drops of food colouring to the water.

Development

Next, you are going to begin the mixing experiment. Help the child to pour a bit of oil and water into the shallow dish, ask them to gently stir the two liquids together. They should observe that no matter much they stir, the water and oil stay separated.

If they are up for a challenge, ask them to describe what they notice if there is more water than oil. They should observe that the oil floats on top of the water. What do they observe if there is more oil than water?

As a final experiment, pour the oil and water into a jar and seal the lid. Help the child to shake the water and oil until it becomes cloudy. Set the jar down and observe what happens. In time, the oil and water should separate into two layers.

Conclusion

Now that they had the chance to explore mixing water and oil, ask them to describe what they learned and make predictions. If oil and water do not mix easily and try to stay separated, what would happen if food colouring was added to the oil. Would it change colour or stay separated?

Explanation

Water is a "polar molecule", this means that one side of the H₂O molecular has a weak positive charge and the other side has a weak negative charge. The positive and negative charges are attracted to one another and that makes water molecules stick together really well. Oil molecules are not polar. Polar and non-polar liquids do not mix easily. However, you can get water to loosen the polar bonds by adding detergent and then oil and water can mix better.

LAVA LAMP

(Activity Time: 15 minutes)

Children will observe that oil and water have different density, oil is less dense than water. They will also observe that antacid tablets react with water but not oil. They can observe that air has less density than both oil and water and will rise to the surface.

Materials

- Clear plastic cups
- Water containing food colouring
- Vegetable oil
- Fizzing antacid (e.g. Alka Seltzer)

Pre Activity Set Up

Pour ~3 inches of oil and water into two cups. Wear clothes you don't mind getting dirty and set up a tablecloth or a tray that you can experiment on without worrying about spills.

Instructions

Introduction (10 minutes)

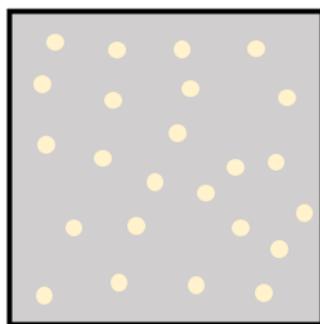
If you did the previous activity, ask the child to remind you what they observed when they tried to get oil and water to mix. Ask them what they think will happen if they mix the oil and water.

Development (20 minutes)

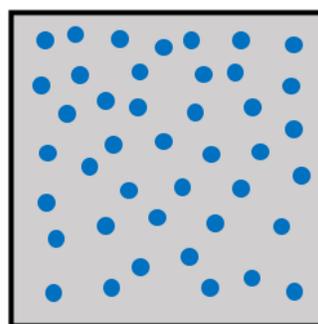
Invite them to add some food coloring to the water and pour the water into the cup of oil. Ask them to describe what they observe. Which liquid is on top? Which is on the bottom?

Now that the oil and water have separated into layers add ½ piece of fizzing antacid tablet to the mixture. Ask the child to watch what happens as the tablet falls through the two liquids. Once the tablet starts reacting with the water it will create carbon dioxide bubbles that will rise to the surface. The bubbles will “stick” to the water and bring some to the top. Once the bubble reaches the surface it pops and the water droplet sinks back to the bottom.

Liquids can have different density



Low Density



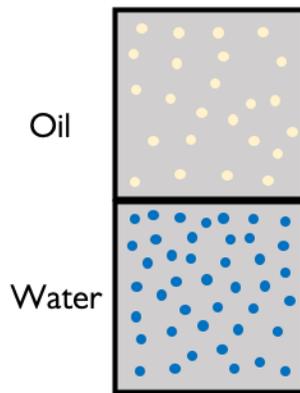
High Density

Conclusion (10 minutes)

Once the antacid tablet is all gone what does the child observe? The water should all sink back to the bottom. You can add another antacid tablet piece to get the reaction going again.

Explanation

Matter is made of molecules and those molecules can be more closely or less closely packed together. This is a substance's density. Liquids and solids that are less dense will float on top of liquids that are more dense. Gases have much lower densities than most liquids (their molecules are very loosely packed) and so they float to the top.



Less dense liquids float on more dense liquids

Oil and water are two liquids that do not mix easily.

Oil is also less dense than water. So oil floats on water instead of mixing with it.