



CHEMISTRY

Water-Hating Lipids



BIG IDEA

Oil and water don't mix because they are afraid of each other!

MATERIALS

- Jar
- Vegetable oil
- Water
- Spoon
- Food coloring

THE SCIENCE

You might have heard that oil and water don't mix. But why is that? Oil is a hydrophobic lipid. This means that it repels water. The word **hydrophobic** literally means afraid of water: hydro = water and phobia = fear. For example, ever heard of arachn**o**phobia? It's the fear of arachnids like spiders!

The oil sits on top of the water because it's less dense than the water. That means its molecules are more spread out than the molecules in water.

Finally, you probably noticed the food coloring mixed with the water, not the oil. This means that the food coloring is **hydrophilic** or is attracted to water. Hydrophilic literally means water-loving: hydro = water and philia = love. Ever heard of **Phi**ladelphia? It's the city of brotherly love!

INSTRUCTIONS

1. Fill your jar about halfway with water.
2. Pour some oil into your jar. Leave some room at the top so it doesn't spill easily.
3. Before we stir them together, make a prediction! What do you think will happen? Go ahead and stir the mixture for at least 15 seconds.
4. What do you notice? Did the two liquids mix together? Probably not! Which one is on top? Why might that be?
5. We're about to add food coloring into the mixture. Before we do, let's make another prediction. What do you think will happen when we add food coloring? Will it color both the oil AND the water?
6. Add 2-3 drops of food coloring into your mixture and stir for another 20 seconds.
7. Let the mixture sit for a few seconds. What do you notice? Did the food coloring mix with the oil or the water?