

Lesson Plan

Description

Soap is a fun molecule because it has an end that likes water and an end that doesn't like water. This makes it perfect for removing oily and fatty things from dishes, hair, skin and clothes. Washing our hands with soap and water has improved our way of life and stopped a lot of illnesses from hurting us.

Learning Outcomes

Students will learn that soap is very important for removing germs from hands.

Student will learn that soap has a water-loving part and a water-“fearing” part.

Materials

- Two small shallow dishes
- Oil
- Coloured water in a dropper bottle (or food colouring)
- Dish soap
- Toothpicks
- Glasses of water
- Spoons
- Various powdered foods: cinnamon, cocoa powder, salt, sugar

Action

First Activity:

- Pour some oil into the two shallow dishes.
- In one shallow dish, carefully drop some of the coloured water (food colouring).
- Use a toothpick to “break” the water droplets. Observe their shape.
- In the second shallow dish, carefully drop some dish soap.
- Use another toothpick to move the dish soap around. Observe the shape.
- Drop some of the dish soap into the dish with the water droplets and observe what happens to them.
- Mix the soap and water in the oil.

Sciencenorth.ca/schools

Science North is an agency of the Government of Ontario and a registered charity #10796 2979 RR0001

With funding from:



The views expressed herein do not necessarily represent the views of the Public Health Agency of Canada

Soap molecules have one end that is attracted to water and another end that is attracted to oil and fat. Soap molecules will allow fat and oil to mix with water and can be washed from surfaces. This is how dish soap cleans greasy dishes.

Shampoo also works this way. Try this at home. Put a small amount of shampoo in your hand and use it to wash your hair. You might not get a lot of bubbles. Rinse. Put another small amount of shampoo in your hand and later your hair again. This time you will probably get more bubbles. This is because the first time the shampoo was surrounding and removing all the oil from your hair. The second time, if your shampoo bubbles more, your hair is cleaner and has less oil to remove.

Second Activity:

- Fill glasses with water.
- Use a spoon to scoop up a food powder.
- Carefully, lower the spoon into the water until it and the powder are under the water.
- Carefully, lift the spoon. What do you observe with the different powders?
- Do not eat the food powder. This is a science class.

Powders like cinnamon and cocoa have oils in them and they do not dissolve in water. Salt and sugar are foods that dissolve very well in water. This is why it is not a good idea to eat cinnamon and cocoa powder when it is dry as it will not dissolve in your mouth.

Consolidation/Extension

If you want to make homemade chocolate milk in class, you could use this as an opportunity to explain the difference between Milk and Sugar which is a solution. The sugar dissolves in the milk which is mostly water. Cocoa powder and milk is a suspension. Solid particles in a liquid. Cocoa particles float in the milk. Cocoa powder is hydrophobic and won't mix in the milk that is mostly water. If you let it sit, the cocoa powder will settle out. It is best to stir it well right before drinking. Warming the milk will also make it easier to mix in the cocoa.