

MAKE MILK FROM WATER AND OIL

A. Question: *Can water and oil mix?*

B. Materials Needed:

1. A glass/plastic clear jar (or beaker)
2. Stirrer
3. Cooking oil
4. Detergent

C: Procedure:

1. Fill the jar about half way with water and pour half of that volume of oil over the water.
2. Stir the two liquids with a spoon of glass stirrer and leave it for a while and observe what is happening to the mixture.
3. Ask the students: “How can I make the two liquids to stay mixed?” Now add a few squirts of liquid detergent and stir thoroughly.
4. After mixing thoroughly, leave the jar alone and observe (if the emulsion separates again you may need more detergent or more vigorous stirring).

D: Anticipated Results:

Students should observe separation of water and oil.

E: Thought Questions for Class Discussion:

1. After stirring without detergent, what did you observe in the jar?
2. What made the two liquids stay mixed as an emulsion?
3. How would you define “emulsion”?
4. What is the term for a finely divided solid in a liquid?
5. Can you name some examples of finely divided solids in a liquid?
6. What is a finely divided solid in a gas? Examples?
7. What do we usually call fine droplets of liquid in the air?
8. What do we call finely divided gas bubbles in liquid?

F: Explanation:

When mixing oil and water, the oil will break up in small droplets and be dispersed in the water very temporarily. After leaving the jar with the mixture alone for a while, the two clear liquids will separate: oil forming a layer above the water because of its smaller density. After adding some liquid detergent (the emulsifier) and some vigorous stirring, the small droplets of oil will stay dispersed, forming an emulsion. Examples of an emulsion: milk, mayonnaise, salad dressings, butter, etc.

Finely divided droplets of liquid in gas is called mist or fog, colloidal solid in liquid is called a suspension: muddy water; a solid colloid in gas is called smoke. An example of a colloidal dispersion of solid in solid is gold particles in ruby glass; gas bubbles in liquid is commonly called: foam.