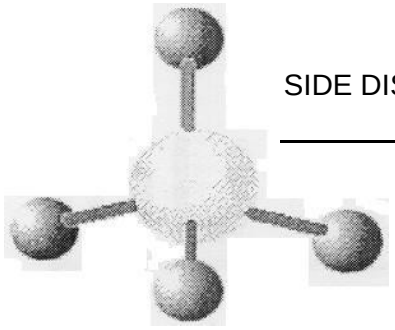
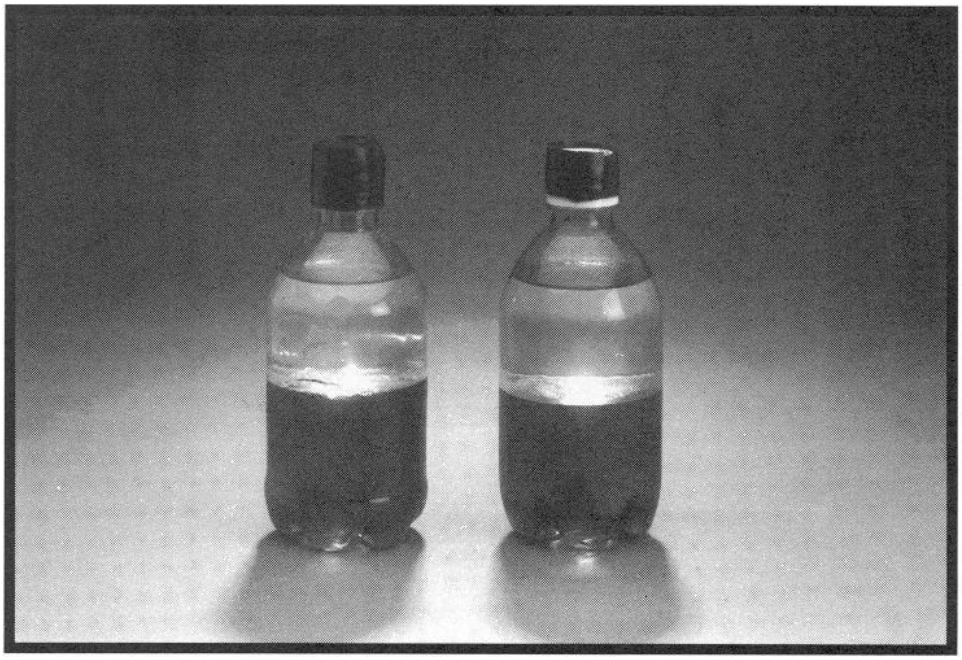


SIDE DISPLAY Miscibility

Visitors observe a jar containing two separate layers of liquids.



OBJECTIVES:

Visitors observe that only one layer is colored. They make waves in the jar by tilting it back and forth. Visitors learn about miscibility and solubility.

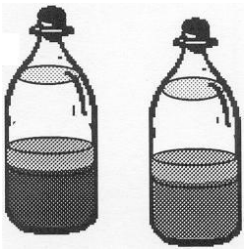
SCIENCE TOPICS	PROCESS SKILLS	VOCABULARY
Density	Observing	Atom
Miscibility	Comparing	Density
Properties of Molecules	Investigating	Liquid
Solubility		Miscible
		Molecule

Miscibility

To do and notice:

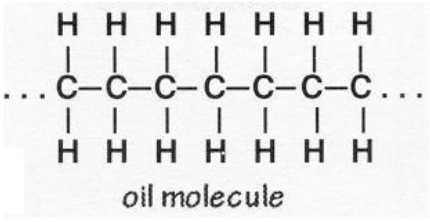
Pick up one of the bottles and tilt it back and forth.

- What happens?
- Can you see two separate layers of liquid?
- What color is each layer?

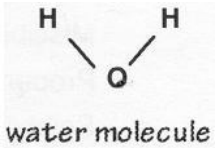


What is going on?

Miscibility describes how well a substance will
mix with another substance.



Liquids may look similar but they act differently depending on the type of molecules
that make them up. There are two different liquids in the bottle: water and oil. Oils are made up of long chains of carbon (C) and hydrogen (H) atoms, called hydrocarbons. They do not mix well (are not miscible) with the smaller, "V" shaped molecules of water (H_2O).



The molecules in food coloring mix well (are miscible) with water molecules but not with the long hydrocarbon molecules of oil, so only the water layer is colored. The oil is less dense (lighter) than water so the oil layer floats on top of the water.

Because of their poor miscibility, oil and water can form "ocean waves" in a bottle.

MATERIALS

(with amounts to have on hand)

- One small plastic soft-drink bottle
- Mineral oil (250 ml)
- Food coloring
- Electrician's tape

Setup/Takedown Procedures

ORIGINAL SETUP

❑ Fill the bottle halfway with mineral oil. Add enough water to reach the bottom of the neck of the bottle. Add one or two drops of food coloring. Screw on the top and tape it securely shut. Swirl the liquids to mix the food coloring with the water layer.

WEEKLY SETUP

❑ Set out the plastic bottle(s) and public copy in a Plexiglas holder.

WEEKLY TAKEDOWN

❑ The bottle(s) can be saved and reused indefinitely.

RUNNING SUGGESTIONS

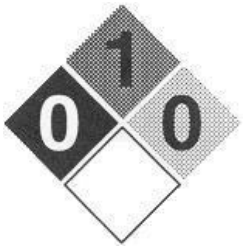
◊ This is an extremely low-maintenance display. Relate this to the Unit 6 experiment, "Making Waves."

◊ For variation, make another bottle and use a different food coloring.

EXTENSIONS

People can try this at home with baby oil and water. You can also relate this to the Unit 5 experiment, "To Dye For."

SAFETY & DISPOSAL



Mineral oil is a flammable substance; consult the Material Safety Data Sheet (MSDS) for additional information.