

UNIT 2 - BASIC PRINCIPLES OF BODY CHEMISTRY

ACTIVITY - The Chemistry of Water

Objective:

1. To discuss the properties of water.
2. Discuss and demonstrate surface tension.
3. Students will define and give examples of the states of matter.
4. Discuss and define: solvent, solute, and solution.
5. Students will make a water molecule combining the class molecules together forming water.

Materials needed: (For each student.)

Activity 1

One large beaker or jar or paper cup, black pepper, one small needle, water, and a dish washing detergent.

Activity 2

One large Styrofoam ball, two small Styrofoam balls, two toothpicks.

Strategy:

Review properties of water showing the natural existence of water in the three states of matter, solid, liquid, and gas. Discuss and demonstrate the solubility of water using sand, sugar, oil, vinegar and salad dressing. Identify the solvent, solute, and solution. The students will readily recognize that all substances do not dissolve in water and that there are a variety of liquids are used as solvents.

Students will observe a can of coke that has been left in the freezer over- night. What happened? Why? Car radiators sometimes freeze in winter. Why?

In Activity 1, students will fill a large plastic container with water. Sprinkle the surface of the water slightly with black pepper. Discuss observations. Drop a dish washing detergent in the center of the dish. Observe what happens. Class will discuss observations.

Place some water in a cup. The water can be at any level in the cup. Let the water stand for two or three minutes. Place a small needle on the surface of the water. Observe what happens? Why?

Place a small needle on the surface of the water using forceps. Discuss observations. Was it easier to place the needle on the surface of the water with your fingers or with the forceps? Class will discuss their observations and give reasons as to what they think happened.

In Activity 2, students will construct a water molecule showing how the hydrogen atoms are bonded to the oxygen atom using toothpicks. The class will bond their molecule with another molecule (in a straight chain) to show how water is formed. The water molecule looks very much like a Mickey Mouse ears. It has a covalent bonding and is polar because of the 105 degree angle between the hydrogen atoms.

Conclusion:

Water exists in three different forms. Plants and animals cannot survive without it. We use it in every aspect of our daily lives. Solubility, expansion and surface tension are some of the properties that make water unique. Water is the universal solvent. A water molecule is covalently bonded. The molecules of water are hydrogen bonded.