Water Worksheet

1. Why do you suppose a wet cloth that is hung outdoors in freezing weather can be retrieved later in a dry state?
    a. Sublimation: water freezes and then sublimates
    b. Wind or air currents: water molecules as always bouncing and jumping about. Most of them come back to the surface, but air currents can force them to "fly away."
    c. Concentration gradients: atoms naturally move from an area of high concentration (wet cloth) to an area of low concentration (the air). This is especially relevant here in Utah where the humidity is so low.
2. When might you see condensation, evaporation, melting, or freezing as part of a normal weather pattern? What evidence do you have that these changes have occurred?

Water evaporates in to the atmosphere to form clouds. The water freezes in the clouds but then melts as it comes to earth as rain. If it doesn't melt, it is snow.

3. How is it possible for water to fracture rock when it freezes?

The molecular structure of water expands when it freezes, breaking the rock.

4. What do you suppose would happen if you placed an ice cube in a beaker containing pure ethanol (density = 0.789 g/mL)? Would it sink or float?

The density of ice is **0.9340 g**/cm^3. Since it is more dense than ethanol, it will sink.

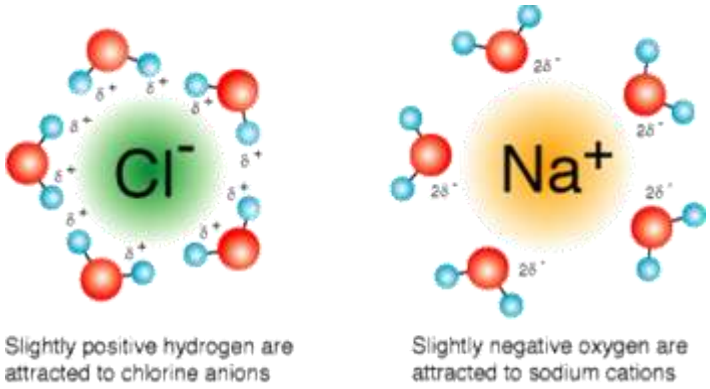
5. How can a solution be classified as aqueous?

An aqueous solution is a solution in which the solvent is water.

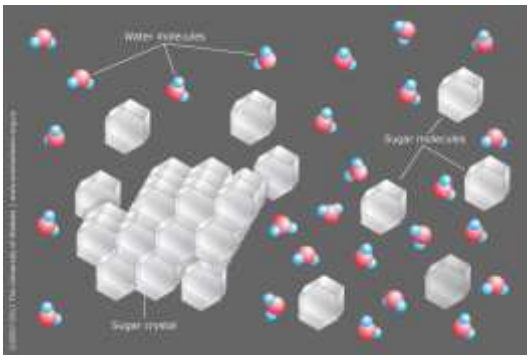
6. Define solvent and solute.
    - A **solute** is the substance to be dissolved (sugar).
    - The **solvent** is the one doing the dissolving (water).

7. Construct a diagram showing what happens on the molecular level when the following substances are added to water:

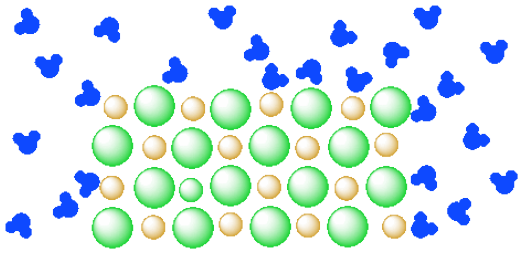
   a. A soluble compound that dissociates into ions



   b. A soluble compound that does not dissociate into ions



   c. An insoluble compound

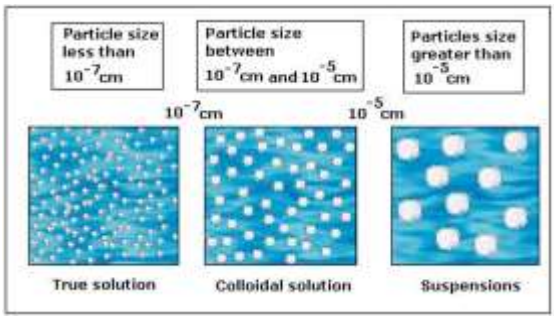


8. You mix 50 mL of pure water with 30 mL of 95% ethanol and stir until a completely homogeneous mixture is produced. You then measure the new volume of the solution.

   a. What might you expect the new volume to be? 80 mL

   b. When you put the solution into a graduated cylinder, you see that it has a volume of 76 mL. What might be your explanation for this? The smaller ethanol molecules fit in between the water molecules

9. What differentiates the particles that make up colloids and suspensions?



10. Categorize each of the following substances as a foam, aerosol, emulsion, gel, sol, or solid sol:
    a. Jelly: gel
    b. shaving cream: foam
    c. car exhaust: smoke
    d. Aquanet hairspray: aerosol
    e. salad dressing: emulsion
    f. paint: sol
    g. glass: solid sol