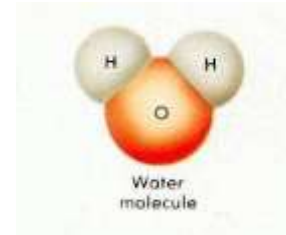


Significance of Water

Observation Lab



It has been said that “the chemistry of life is water chemistry.” Because of its chemical properties, water is the medium in which most of life’s chemical reactions occur. Life first evolved in water, it resided there exclusively for three billion years, most life is now concentrated in water-rich areas, and the cells of organisms are about 70 to 90 percent water.

Because of its polarity, water molecules attract to each other forming hydrogen bonds. This attraction of like molecules is called cohesion. Because water is cohesive, it remains liquid at normal temperatures over much of the Earth. Cohesion allows water to move up a plants and it results in the tension that allows some organisms to live on the surface of water. Water’s polarity results in many important characteristics, such as adhesion, high heat capacity, and versatility as a solvent.

Perform the activities outlined below. Then, write a synopsis in you lab notebook of each activity that includes the following:

- ❑ Brief description or sketch of the activity and your observations (3-5 sentences).
- ❑ Interpretation of the observation.

Must be done at school

} Can be done at home

ACTIVITY	EXPLAIN USING...
Using the model kits, determine the maximum number of H-bonds that a water can form with other waters.	Polar Hydrogen bonding Cohesion
Make staples float on water. Challenge... make a paperclip float on water!	Polar Hydrogen bonding Cohesion Surface tension
Count the number of drops of water you can put on top of a coin.	Polarity Hydrogen bonding Cohesion
Fill a beaker with water and sprinkle pepper on the top. Add a drop of soap to the top of the water.	Polar Hydrogen bonding Cohesion Surface tension Hydrophobic
Use molecular model kits to show what water looks like as a solid, a liquid and a gas.	Polar Hydrogen bonding Density
Determine if ice sinks or floats when placed in liquid water.	Polar Hydrogen bonding Density
Wet a piece of string and tie it to a graduated cylinder. Position one end of the string over the spout and put the other end into an empty cup. Pull the string taught. Slowly pour the water along the string.	Polar Hydrogen bonding Cohesion Adhesion

ACTIVITY	EXPLAIN USING...
Use the molecular model kits to simulate the adhesion of water to a tube	Polar Hydrogen bonding Cohesion Adhesion
Place a pinch of salt (an ionic compound) in the bottom of a test tube. Add 10 ml of water the test tube. Roll the test tube between your hands to mix the contents. What happens to the salt crystals?	Polar Hydrogen bonds Ion Solvent Hydrophilic
Use molecular model kits to show how water dissolves salt (an ionic compound)	Polar Hydrogen bonds Ion Solvent Hydrophilic
What will happen if water comes in contact with a nonpolar molecule? Mix oil and water to find out.	Polar Nonpolar Hydrophobic
Observe the temperature of boiling water.	Polar Hydrogen bonds Cohesion Heat capacity
Drop 1 drop of water on the lab station and one drop of ethanol on the lab station. Compare the time it takes each to evaporate.	Polar Hydrogen bonds Cohesion Heat capacity
Read a sentence through a beaker of water	Transparency