Topic/Objectives: 3-1 The Unique Nature of Pure Water; (1) Describe the water's unique properties and relate these properties to its chemical structure; (2) Determine whether substances will sink or float based on their densities; (3) Give an example of how properties of water affect marine organisms	**Name:** **Date:** **Period:**
Essential Question: How does the unique properties of water affect the survival of life on Earth?	

Questions:	**Notes:**
	The Importance of Water ◦ Our bodies contain a high percentage of water. Marine organisms are mostly water (by weight). ◦ Seawater is primarily _____ and salt (about 99.5%). Molecular Structure ◦ Each water molecule has two slightly positive _____ atoms and an negatively charged _____ atom. ◦ Due to these slight electrical charges, water molecules are attracted to one another, forming _____ bonds.
	_____ (measured C, K or F) reflects the average kinetic energy of the particles; the faster the movement the higher the temperature _____ (measured Cal or J) is the total kinetic energy of all the particles in a substance or object. ◦ One _____ is the amount of heat necessary to raise the temperature of 1 gram of water one degree C. ◦ Comparing a cup of hot coffee to the Atlantic Ocean, the cup of coffee has a higher _____, but the ocean has more _____ because it has far more mass. ◦ Heat can be transferred from a substance with _____ temperature to a substance with a _____ temperature.

	Water is the only substance that naturally occurs in all three states on Earth—solid, liquid, and gas.
	◦ In liquid water, _____ _____ hold most of the molecules together in small groups.
	◦ If heat is added to water, the molecules break free of hydrogen bonds and go to the gaseous or vapor phase - _____.
	◦ Water freezes (becomes solid) when the molecules move so slowly that hydrogen bonds form among molecules.
	  ◦ Water is extremely unusual in being _____ _____ as a solid than as a liquid.
	  ◦ A floating layer of ice _____ the water below it so that it doesn't freeze; this allows organisms to survive under ice layers.

_____ _____ is the amount of energy required to raise a mass of substance one degree C.

- Ice melts at a much higher temperature than similar substances because of its hydrogen bonds.
- Ice also absorbs a lot of heat when it melts because of hydrogen bonding.

The amount of heat required to melt a substance is called its _____ _____ _____ _____, with water's being higher than any other commonly occurring substance.

The amount of heat needed to raise a substance's temperature by a given amount is its _____ _____, where water has one of the highest heat capacities of any naturally occurring substance.

Water's _____ _____ protects marine organisms from rapid and drastic temperature changes.

_____ is the sticking together of particles of the same substance.

- Because water contains a large number of hydrogen bonds, water has more _____ than other liquids.

_____ _____ is the measure of the elastic tendency of liquids.

- The cohesion of water molecules is greater than _____ (sticking together of particles of different substances).
- Cohesive bonds cause water molecules to arrange into an ordered _____ at the water surface.

Water also acts as a _____, which means that substances can dissolve in water. Water is known as the _____ _____.

- Water is good at dissolving salts, which are made of _____ (electrically charged particles).
- The _____ in salt pull apart, or dissociate, when the salt dissolves in water.

Summary: