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| **Marine Science**  **UNIT: properties of water** | **Essential Question:**  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | **Name:** |
| **Class:** |
| **Period:** |
| **Date:** |
| **Questions** | **Notes** | |
| Water Cycle | Diagram: | |
| Earth’s water budget | * Ocean - \_\_\_\_ % of all water on Earth * Determines * Has changed in | |
|  | * Molecule – * Water molecule – | |
| Bonding | Covalent bond between oxygen and hydrogen      Sketch:  The polar (dipolar) molecule      Sketch:  Hydrogen bonds connecting water molecules      Sketch:  Hydrogen bonds are weak, easily broken. | |
| What is the difference between temperature and heat? | Temperature –  How fast are the particles moving? The \_\_\_\_\_\_\_\_ they are moving, the \_\_\_\_\_\_\_\_\_\_\_\_ the temperature.  Heat –  Measured in \_\_\_\_\_\_\_\_\_\_\_\_\_ - The amount of heat necessary to raise the temperature of one gram of water 1 degree Celsius.  Heat is transferred from a substance of \_\_\_\_\_\_\_\_\_\_\_ temperature to a substance of \_\_\_\_\_\_\_\_\_\_\_\_ temperature. | |
| Three states of water | Water is the only substance that naturally occurs in all three states on Earth. It resists changes in temperature because of the hydrogen bonds.  Freezing -  Evaporation – | |
| Water’s Density | * + Above \_\_\_\_\_ºC-Density increases w/ decreasing Temperature   + \_\_\_ºC & below- reverses   + At \_\_ºC molecules form a crystal structure- | |
| More about the three states of water | * + 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.   + \_\_\_\_\_\_\_\_\_\_\_\_\_ can live in the liquid water below the layer of ice. | |
| Specific heat | * + Ice melts at a much \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than similar substances because of its hydrogen bonds.   + Ice also absorbs a lot of heat when it melts because of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Water has a high specific heat.   + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the amount of energy required to raise a mass of substance one degree Celsius. | |
| Heat capacity | * + The amount of heat needed to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.   + Water has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.   + Water’s heat capacity \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | |
| Cohesion | * + Cohesion is the sticking together of particles of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.   + Because water contains a large number of hydrogen bonds, water has \_\_\_\_\_\_\_\_\_\_\_\_cohesion than other liquids. | |
| Adhesion | * + the property of water molecules being attracted to **\_\_\_\_\_\_\_\_** types of molecules.   + Causes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ The ability of water to crawl up a very skinny tube.   + This is because the water molecules are being attracted to the \_\_\_\_\_\_\_\_\_\_\_ of the glass tube. | |
| Surface tension | * + \_\_\_\_\_\_\_\_\_– water’s resistance to objects attempting to penetrate its surface. It is a strong, flexible \_\_\_\_\_\_\_\_ over water surface caused \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | |
| Water as a solvent | * + Water also acts as a \_\_\_\_\_\_\_\_\_\_, which means that substances can \_\_\_\_\_\_\_\_ in water. Water is known as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_.   + Water is good at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which are made of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (electrically charged particles).   + The ions in salt pull apart, or \_\_\_\_\_\_\_\_\_\_\_\_, when the salt dissolves in water. | |
| Summary: | | |