Name:_____Period:_____Date:_____
Ms. Randall Marine Science
Unit 5 Chemical Oceanography Exam Study Guide

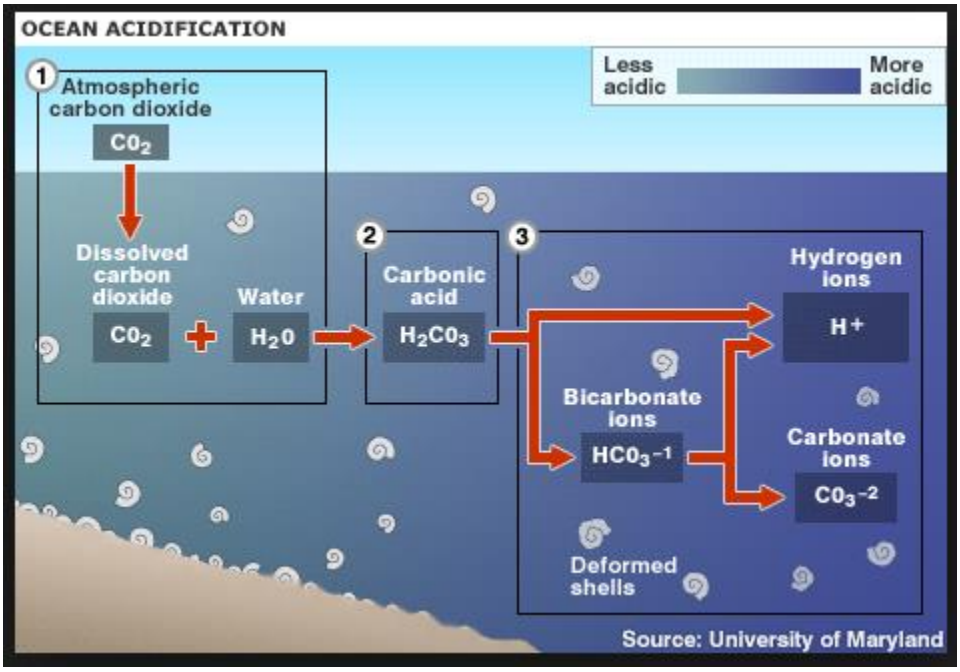
1. Describe the water cycle

   The cycle of processes by which water circulates between the earth's oceans, atmosphere, and land, involving precipitation as rain and snow, drainage in streams and rivers, and return to the atmosphere by evaporation and transpiration.

2. Define pH. Explain ocean acidification. How does the ocean buffer pH?

   It tells how acidic or alkaline a substance is. More acidic solutions, have lower **pH**. More alkaline solutions, have higher **pH**. Substances that aren't acidic or alkaline (that is, neutral solutions) usually have a **pH** of 7.

   Ocean acidification is the ongoing decrease in the pH of the Earth's oceans, caused by the uptake of carbon dioxide (CO_2) from the atmosphere. Seawater is slightly basic (meaning pH > 7).



3. Describe the structure and special properties of the water molecule due to its polarity (adhesion, cohesion, surface tension).

The **polarity** of **water** creates a slightly positive charge on hydrogen and a slightly negative charge on oxygen, contributing to **water's** properties of attraction. Cohesion and Adhesion. ... For example, the molecules of a water droplet are held together by cohesive forces, and the especially strong cohesive forces at the surface

constitute surface tension. When the attractive forces are between unlike molecules, they are said to be adhesive forces.

4. Define specific heat capacity and the impact on the ocean's temperature

Heat capacity is the amount of heat required to raise the temperature of a object by 1 degreeC without changing the state of matter. Water has a much higher heat capacity, and specific heat, than air, meaning it takes more energy to heat water than it does to heat air.

5. Define Salinity. What are the sources of ocean salts? How does salinity change with ocean depth?

Salinity is a measure of how much salt is dissolved in water. The average salinity of seawater for all Earth's oceans is about 35 grams of dissolved salts per kilogram of seawater. This is shown as 35 parts per thousand, or 35%.

After years and years of river inflow and evaporation, the salt content of the lake water built up to the present levels. The same process made the seas salty. Rivers carry dissolved salts to the ocean. Water evaporates from the oceans to fall again as rain and to feed the rivers, but the salts remain in the ocean. *Halocline*, vertical zone in the oceanic water column in which salinity changes rapidly with depth, located below the well-mixed, uniformly saline surface water layer.

6. Describe changes in temperature and pressure with changes in ocean depth.

A thermocline is the transition layer between warmer mixed water at the ocean's surface and cooler deep water below.

Pycnocline is a layer, zone, or gradient of changing density, esp. a thin layer of ocean water with a density that increases rapidly with depth

7. Describe how temperature, and salinity affect water density

   Less dense water floats on top of more dense water. Given two layers of water with the same salinity, the warmer water will float on top of the colder water. There is one catch though! Temperature has a greater effect on the density of water than salinity does.