**Chapter 13 Exploring the Oceans**

**Section 1 Earth's Ocean**

**Objectives**

 **List the major divisions of the global ocean.**

 **Describe the history of Earth's oceans**

 **Identify the properties of ocean water.**

 **Describe the interactions between the ocean and the atmosphere.**

**71% is covered by the Earth's Ocean**

**Divisions of the Global Ocean**

 **Global Ocean**

 **divided by the continents**

 **Pacific Ocean - largest**

 **Atlantic Ocean**

 **Indian Ocean**

 **Arctic Ocean - smallest**

 **most of surface is covered by ice**

**Refer to page 374**

**How did the oceans form?**

 **4.5 billion years ago - there were no oceans**

 **4.0 billion years ago - Earth started to cool - water vapor began to condense, soon it began to rain, rain filled the deep levels and the first oceans formed**

**Characteristics of Ocean Water**

 **Refer to page 376**

**Ocean water is salty**

 **Sodium Chloride**

 **same salt that is on your food**

 **NaCl - most abundant dissolved mineral from rivers and streams**

 **Salinity**

 **a measure of the amount of dissolved salts in a given**

 **amount of liquid**

**Climate affects Salinity**

 **different parts of the ocean may have different salt concentrations**

 **hotter dryer climates have more salt - WHY?**

**Water movement affects Salinity**

 **slower moving water = higher salinity**

 **Temperature Zones**

 **refer to page 377**

**Surface Temperature Changes**

 **different parts of the ocean have different**

 **temps - water near equator is much warmer than water near the poles**

 **WHY?**

**The Ocean and the Water Cycle**

 **evaporation, condensation, precipitation**

**The Global Thermostat**

 **Ocean Function - regulate temperatures in the atmosphere**

 **by absorbing and holding energy from the sun**

**Section 2 The Ocean Floor**

**Objectives**

 **Describe technologies for studying the ocean floor.**

 **Identify the two major regions of the ocean floor.**

 **Classify subdivisions and features of the two major regions**

 **of the ocean floor.**

**It has been said that we know more about the surface of the moon than about the ocean floor.**

 **Do you believe this? Explain.**

**Studying the Ocean Floor**

 **Seeing by Sonar**

 **Sonar = sound navigation and ranging**

 **ships send sound pulses to the bottom of the ocean**

 **then bounce off the floor and return, then calculate by multiplying half the travel time by**

 **the speed of sound**

 **the longer it takes to return the deeper it is**

 **Oceanography via Satellite**

 **Satellite - Seasat**

 **sent images back to Earth where scientists could measure the direction and speed of ocean currents**

 **Studying the Ocean with Geosat**

 **Geosat - military satellite**

 **used to measure slight changes in the height**

 **of the ocean floor**

 **satellites can cover more space than ships**

**Revealing the Ocean Floor**

 **Not a flat surface**

 **refer to page 384-385**

 **Continental Shelf - begins at shoreline and slopes slightly**

 **Continental Slope - steep incline following the continental**

 **shelf**

 **Continental Rise - base of the continental slope, made of**

 **sediments**

 **Abyssal Plain - large flat part of the ocean floor, covered**

 **with mud and remains of dead organisms**

 **Mid-ocean Ridge - chains of mountains that form when**

 **plates pull apart**

 **Rift Valley - long, narrow valley that forms where the plates**

 **pull apart**

 **Seamounts - individual mountains formed from magma that**

 **has pushed its way to the surface, must be 1000 m**

 **high, if grows above sea level it becomes an island**

 **Ocean Trench - cracks in the ocean floor when two plates**

 **are being pushed together and one subsides**

**Section 3 Life in the Ocean**

**Objectives**

 **Identify the three groups of marine life.**

 **Describe the two main ocean environments.**

 **Identify the ecological zones of the benthic and pelagic environments.**

**Deep Ocean Video - Planet Earth Series**

**Three Groups of Marine Life**

 **Plankton**

 **organisms that float or drift near the surface**

 **microscopic**

 **Two types**

 **Phytoplankton - plantlike**

 **Zooplankton - animal-like**

 **Nekton**

 **all organisms that swim actively in open water**

 **whales, sea lions, dolphins**

 **Benthos**

 **live on or in the ocean floor**

 **crabs, worms, coral, clams**

**refer to page 388**

**Benthic Environment - refer to pages 390-391**

 **area near the bottom of a pond, lake or ocean and all**

 **the organisms that live on or in it**

 **Intertidal Zone**

 **located between low and high tide limits**

 **organisms must be able to live in water and land**

 **holdfasts - rootlike structures that help hold plants**

 **Sublittoral Zone**

 **most organisms remain in the upper 100m where**

 **pressure, sunlight, temperature are constant**

 **Bathyal Zone**

 **ranges from about 200m - 4000m**

 **plant life rare**

 **sponges, sea stars, octopuses**

 **Abyssal Zone**

 **no plants and very few animals live here**

 **animals live near - black smokers: hot-water vents**

 **largest zone**

 **Hadal Zone**

 **includes the floor of the ocean trenches**

 **a type of sponge, clams, worms**

**Pelagic Environment**

 **the area in the ocean between the sublittoral zone and the abyssal zone**

 **Neritic Zone**

 **covers the continental shelf**

 **largest concentration of marine life**

 **Oceanic Zone**

 **includes the volume of water covering the ocean floor but not including the continental shelf**

**Homework**

 **Create a drawing of the 5 imaginary organisms, each inhabiting a different benthic zone. You should describe each plant or animal.**

 **You must:**

 **create and color a drawing**

 **include 5 organisms - one for each level**

 **description of organism**

 **how the organisms obtain food**

 **how they avoid predation**

 **how they withstand the water pressure and temperature at the depth where they live**