**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**