Environmental Science  Chapter 3 Section 2

1. Describe the composition of the Earth's atmosphere.
   Nitrogen = 78%
   - comes from the eruptions of volcanoes and decaying plants and animals
   Oxygen = 21%
   - primarily produced by plants
   Other gases (including argon, carbon dioxide, methane, and water vapor) = 1%
   - also contains many types of tiny, solid particles – atmospheric dust

2. Describe a characteristic of each layer of the Earth's atmosphere.
   - atmosphere is divided into layers based on changes in temperature that take place at different altitudes
     A. Troposphere –
     - nearest the Earth's surface
     - warmest layer (temperature decreases as altitude increases)
     - almost all weather occurs here
     - densest atmospheric layer
     B. Stratosphere –
     - above the troposphere
     - temperatures rise as altitude increases
     - ozone is concentrated in a layer here, where it absorbs ultraviolet rays, protecting organisms from damage
     C. Mesosphere –
     - above the stratosphere
     - absorbs little heat from the sun
     - air is thin and cold, coldest layer of the atmosphere
     D. Thermosphere –
     - farthest from the Earth's surface
     - nitrogen and oxygen absorb high energy solar radiation, such as X-rays and gamma rays

3. Explain the 3 mechanisms of heat transfer in Earth's atmosphere.
   - radiation – transfer of energy across space and in the atmosphere
   - conduction – the flow of heat from a warmer object to a colder object when the objects are placed in direct physical contact
   - convection – the transfer of heat by air currents (hot air rises, cold air sinks)

4. Describe the role of greenhouse gases in Earth's atmosphere.
   - Greenhouse gases absorb heat and radiate it back to the surface of the Earth.
   - without the greenhouse effect, the Earth would be too cold for life to exist

Environmental Science Chapter 3 Section 3

1. Name and describe each of the 3 major processes in the water cycle.
   - evaporation – liquid water is heated by the sun and rises into the atmosphere as water vapor
   - condensation – water vapor forms droplets on dust particles
   - precipitation – large droplets fall from clouds (may be in the form of rain, snow, sleet, or hail)

2. Describe the properties of ocean water.
   - salinity
   - temperature – the ocean is divided into 3 zones based on temperature:
     * surface zone, thermocline, and deep zone

3. Describe the 2 types of ocean currents.
   - surface currents – wind driven and may be hot or cold (affect the climate of the land they flow past)
   - deep currents – cold and flow slowly along the ocean floor

4. Explain how the ocean regulates Earth's temperature.
   - absorbs and stores energy from sunlight (absorbs over ½ of the solar radiation that reaches the Earth);
   - absorbs and releases heat more slowly than land does – causing atmospheric temperature changes to occur slowly

5. Name 2 things that confine living things to the biosphere.
   - liquid water
   - moderate temperature
   - energy source (sunlight)

6. Explain the difference between open and closed systems.
   - Closed systems – energy enters and leaves, but matter does not
   - Open systems – both matter and energy are exchanged between a system and the surrounding environment