



Note-taking Worksheet

Atmosphere

Section 1 Earth's Atmosphere

- A. _____—thin layer of air that protects the Earth's surface from extreme temperatures and harmful Sun rays
- B. Atmospheric makeup—mixture of gases, _____, and liquids
1. Early atmosphere was much different than today.
 - a. Volcanoes produced nitrogen and carbon dioxide, but little _____.
 - b. More than 2 billion years ago _____ began producing oxygen.
 - c. Eventually oxygen formed an _____ layer that protected Earth from harmful rays.
 - d. _____ plants and diverse life forms developed.
 2. Atmospheric _____ include nitrogen (78%), oxygen (21%), carbon dioxide, water vapor, and argon.
 - a. Atmosphere is changing with the introduction of pollutants: increasing human energy use is increasing the amount of _____.
 - b. Pollutants mix with oxygen and other chemicals to form _____.
 3. _____ include dust, salt, and pollen.
 4. _____ include water droplets and droplets from volcanoes.
- C. _____ main layers of the atmosphere
1. _____ levels
 - a. Lowest layer, where humans live, is the _____, which extends about 10 km up, and contains most of the water vapor and gases.
 - b. Extending from 10 km to 50 km above Earth, the _____ contains higher levels of ozone.
 2. _____ levels
 - a. _____ extends from 50 km to 85 km and is the layer in which shooting stars are visible.
 - b. Thickest part of atmosphere is from 85 km to 500 km and is called the _____ for its high temperatures.
 - c. Within the thermosphere is a layer of charged particles called the _____ that can help carry radio waves.
 - d. _____—outer layer of atmosphere in which the space shuttle flies has very few molecules
- D. _____—molecules closer to the surface are more densely packed (at higher pressure) together than those higher in the atmosphere because of the mass of gases pressing down on them from higher in the atmosphere.

Note-taking Worksheet (continued)

- E. _____ in atmospheric layers
1. The troposphere is warmed primarily by the Earth's surface; temperature _____ as altitude increases in this layer.
 2. Temperatures _____ as altitude increases in the stratosphere, particularly the upper portion because ozone absorbs energy from the Sun.
 3. Temperatures _____ with altitude in the mesosphere.
 4. Thermosphere and exosphere are the first to receive the Sun's rays, so they are very _____
- F. _____—about 19 km to 48 km above Earth in the stratosphere, this layer of 3-atom molecules protects the Earth from the Sun's harmful **ultraviolet radiation**
1. Life on Earth, as we know it, _____ on it.
 2. Pollutants called _____ (CFCs) are destroying the ozone layer.
 - a. CFCs are used in _____, air conditioners, aerosol sprays, and foam packaging.
 - b. If these products develop a leak, CFCs can enter the _____.
 3. The ozone layer has a large hole over _____ and a smaller one over the North Pole.

Section 2 Energy Transfer in the Atmosphere

- A. Some energy from the Sun is reflected back into _____, some is absorbed by the _____, and some is absorbed by _____ and water on Earth's surface.
- B. _____—energy that flows from an object with a higher temperature to one with a lower temperature
1. _____—energy transferred in rays or waves
 2. _____—transfer of energy when molecules bump into each other through contact
 3. _____—transfer of heat by the flow of a material
 - a. Molecules move closer together, making the air more dense, and air _____ rises.
 - b. Cold air _____, pushing up warm air, which then cools and sinks, pushing up more warm air.
- C. The _____ cycle—water moves back and forth between Earth's atmosphere and surface
1. Energy from the Sun causes water to _____ from the **hydrosphere**, and rise as vapor.

Note-taking Worksheet (continued)

2. Water vapor in the atmosphere can cool and return to liquid form through _____
 - a. When water vapor condenses, clouds of tiny water _____ may form.
 - b. Water droplets collide to form larger _____.
 3. Water drops fall back to Earth as _____.
- D. Earth's atmosphere is unique—it holds just the right amount of the Sun's _____ to support life.

Section 3 Air Movement

- A. _____—forms when air in an area of high pressure moves to an area of lower pressure
1. Different areas of Earth receive different amounts of the Sun's _____.
 - a. The equator's warm air, being less dense, is pushed upward by denser, _____ air.
 - b. The pole's cold air, being more _____, sinks and moves along Earth's surface.
 2. The _____—rotation of the Earth causes moving air and water to change direction to the right north of the equator and left south of the equator
- B. Global winds—wind patterns, caused by convection currents combined with the Coriolis effect, of Earth that affect the world's _____
1. Near the equator, very little wind and daily rain patterns called the _____
 2. Surface winds
 - a. Between the equator and 30° latitude (north and south) are steady _____.
 - b. Between 30° and 60° latitude (north and south) the _____ blow in the opposite direction from the trade winds.
 - c. _____ blow from northeast to southwest near the north pole and from southeast to northwest near the south pole.
 3. Upper troposphere—narrow belts of strong winds called _____
 - a. Jet stream moves _____ in the winter.
 - b. Helps _____ develop and move across the country
- C. Local wind systems—affect _____ weather
1. _____—a convection current blows wind from the cooler sea toward warmer land during the day
 2. _____—at night, air moves toward the water as the land cools more rapidly than the water