Chapter 11 - Atmosphere Page 2

11.1 Atmosphere Basics

1. Describe the composition of the atmosphere:
2. Compare and contrast the various layers of the atmosphere:
3. Identify 3 methods of transferring energy throughout the atmosphere:

Vocabulary:

ozone-...

*Complete all vocab words*

1. solar energy interacts with the atmosphere to create different weather climates

Atmospheric Composition

1. the air is a combination of many different gases
2. 99% of the atmosphere is nitrogen and oxygen, 1% is argon, hydrogen, carbon dioxide, water vapor, and other gases
3. Nitrogen and oxygen are critical to life on earth

Key atmospheric gases:

1. Water vapor can be as much as 4% and as little as almost 0% of the atmosphere
2. The percentage varies with the seasons
3. Carbon dioxide is less than 1%
4. Carbon dioxide and water vapor regulate the amount of energy the atmosphere absorbs
5. Water vapor also creates clouds, rain, and snow
6. The only substance in the atmosphere that exists in all three states of matter is water
7. Water changing states creates weather and climate
8. There are tiny, solid particles in the atmosphere such as dust and salt
9. Dust and salt are the center of water droplets (condensation nuclei)

Ozone

1. (O3) Ozone is a chemical that exists in the stratosphere controlling ultraviolet radiation to a survivable level for all life on earth
2. Ozone is thinning

Structure of the Atmosphere

1. The structure of the atmosphere- five layers, each is different

Lower Atmospheric Layers

1. The Troposphere has the largest mass (water vapor)-weather occurs and has the most pollution
2. The temperature decreases with altitude in this layer
3. 16km above the tropics, 9km or less at the poles
4. The top of the troposphere is called the tropopause
5. The stratosphere- concentrated ozone- absorbs more ultraviolet radiation which heats it and temperature increases with altitude
6. It ends at about 50km above earth

Upper Atmospheric Layers

1. Mesosphere- no ozone- temperature decreases with altitude
2. Thermosphere- smallest mass- increases in temperature with altitude- >1000c- molecules widely spaced
3. Ionosphere- part of thermosphere- electrically charged particles and lighter gases
4. Exosphere- outermost layer- made of helium and hydrogen- no clear boundary between it and outer space

Solar Fundamentals

1. sun is source of all energy
2. three methods of transfer

Radiation

1. radiation transfers energy through space by visible light, UV rays, and electromagnetic waves
2. higher temperature = shorter wavelength
3. earth’s surface- continuously sends energy back to space
4. \*study diagram 11-4
5. solar radiation does not heat air directly- because the atmo. Does not easily absorb short wavelengths.
6. Energy is absorbed through the atmo with conduction and convection

Conduction

1. similar to hot burner on stove
2. a transfer of energy through contact (frying pan)

Convection

1. transferred energy by flow of a heated substance (convection)
2. as warm air rises it expands and cools (pot of water on stove)
3. convection currents cause weather changes
4. as water or air expands, it becomes less dense and lighter weight

**SECTION REVIEW**  *(ANSWER IN FULL SENTENCES)*

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