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Chapter 11 - Atmosphere Outline

11.1 Atmosphere Basics

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

Vocabulary:

ozone-...

*Complete all vocab words*

* solar energy interacts with the atmosphere to create weather and climate

ATMOSPHERE COMPOSITION

* the air is a combination of many different gases
* 99% of the atmosphere is nitrogen and oxygen, 1% is argon, hydrogen, carbon dioxide, water vapor, and other gases
* Nitrogen 78% and oxygen 21% are critical to life

Key atmospheric gases:

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

Ozone

* (O3) Ozone is a chemical that exists in the stratosphere controlling ultraviolet radiation to a survivable level for all life
* Ozone is thinning

Structure of the Atmosphere

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

Lower Atmospheric Layers

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

Upper Atmospheric Layers

* Mesosphere- no ozone- temperature decreases with altitude
* thermosphere- smallest mass- increases in temperature with altitude- >1000c- molecules widely spaced
* ionosphere- part of thermosphere- electrically charged particles and lighter gases
* exosphere- outermost layer- made of helium and hydrogen- no clear boundary between it and outer space

Solar Fundamentals

* sun is source of all energy
* three methods of transfer

Radiation

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

Conduction

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

Convection

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

SECTION REVIEW *(ANSWER IN FULL SENTENCES)*

1.

2.

3.

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