Name:

Period: Date:

**Notes: Structure and composition of our atmosphere**.

* **Weather and Climate… what’s the difference?**
	+ Weather is always \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and refers to the state of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_at a given \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ Climate is based on the observations of weather conditions over \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and helps us describe a \_\_\_\_\_\_\_\_\_\_\_\_
	+ To understand weather and climate, we first need to understand what our atmosphere is made of
* **The Composition of the Atmosphere**
	+ How old is the earth? \_\_\_\_\_\_\_
		- Over this period of time the composition of the atmosphere has \_\_\_\_\_\_\_\_\_ dramatically
	+ “Air” is not a single gas, it is \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
		- The most abundant gas in the atmosphere is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
		- The second most abundant is oxygen
			* Together make up \_\_\_\_\_% of clean, dry air
		- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is important for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the atmosphere
		- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is the source of all \_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ given off by Earth
	+ Ozone: a form of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_with three oxygen atoms bonded together instead of just two (that’s the O2 we breathe)
		- Results from oxygen absorbing \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
		- The ozone layer is crucial for life on Earth because it \_\_\_\_\_\_\_\_\_\_\_\_\_\_ potentially harmful \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
		- The ozone layer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* We just finished talking about the oceans, which contain water.
	+ Liquids are one type of fluid
	+ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ Most of the properties of our atmosphere that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ as we know it, come from the fluid nature of the atmosphere
* **The Structure of the Atmosphere**
	+ The atmosphere \_\_\_\_\_\_\_\_\_\_\_\_\_\_ very quickly as you travel \_\_\_\_\_\_\_\_\_\_\_\_\_\_ from Earth’s surface
	+ The atmosphere is divided \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ into \_\_\_layers based on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ Layers of the atmosphere
		- The lowest = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
			* Temperature decreases as altitude increases
			* Most important \_\_\_\_\_\_\_\_\_\_\_\_\_phenomena occur here
		- 2nd = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
		- 3rd = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
		- Top = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**END OF PART I**

* **The Earth and Sun interactions**
	+ Nearly all of the energy for changing weather and climate comes from the \_\_\_\_\_\_\_\_
	+ **The Sun is the source of all energy in the atmosphere.**
	+ This energy is transferred to Earth and throughout the atmosphere through conduction, convection & radiation.
		- **\_ is the transfer of energy that occurs when molecules collide.**
			* Through conduction, energy is transferred from the particles of air near Earth’s **\_** to the particles of air in the **\_**  layer of the atmosphere.
			* **For conduction to occur, substances must be \_ with one another.**
			* Conduction affects only a  **\_** atmospheric layer near Earth’s surface.
		- **is the transfer of energy by the flow of a heated substance.**
			* Pockets of air near Earth’s surface are heated, become  **\_**  than the surrounding air, and  **\_ .**
			* As the warm air rises, it  **\_**  and starts to  **\_** .
			* When it  **\_**  below the temperature of the surrounding air, it increases in density and  **\_**
			* Convection currents are among the main mechanisms responsible for the vertical motions of air, which in turn cause different types of weather.
		- **is the transfer of energy through space by visible light, ultraviolet radiation, and other forms of electromagnetic \_ .**
			* The Sun is shining on, and therefore  **\_** , some portion of Earth’s surface at all times.
			* While Earth is  **\_**  solar radiation, it is also continuously **\_** energy back into space.
1. How much of the Sun’s energy that reaches Earth’s atmosphere is reflected back into space? (*add together the amount that is backscattered to space, the amount reflected from clouds, and the amount reflected by the land-sea surface*)

2. How much of the Sun’s energy is absorbed by Earth’s atmosphere and clouds?

3. How much of the Sun’s energy is absorbed by the land and sea?

* If we did not have \_\_\_\_\_\_\_\_\_\_\_to absorb solar radiation, Earth would not be a place where we could live
* This heating of the lower layer of the atmosphere from radiation absorbed by heat absorbing gases is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* … so just like plants grow better in a greenhouse, all life on Earth is able to flourish because of the greenhouse effect
* The temperatures we experience are due to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the atmosphere \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Land \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than water
* Land also reaches \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than water
* The temperature of the land and water influences the temperature of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* This explains why \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ experience \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ temperature variations than cities near \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_