Name:

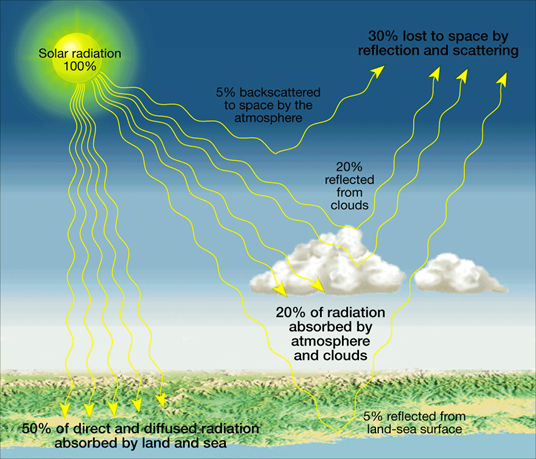
Period: Date:

**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 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_