**Weather versus Climate:**

* Weather:
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ conditions, including temperature, precipitation, wind and humidity, in a particular location over a \_\_\_\_\_\_\_\_\_\_\_ period of time
  + We describe weather using terms like:
* Climate:
  + The usual pattern (the \_\_\_\_\_\_\_\_\_\_\_\_) of the weather in a region over a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ period of time (usually 30 years)
  + The climate of a region determines the types of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that live there

Factors Affecting Climate:

* Distance from \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (latitude)
* Presence of large bodies of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Presence of \_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_ currents
* Land formations
* Height above sea level (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)

**Sun & Earth's Climate System:**

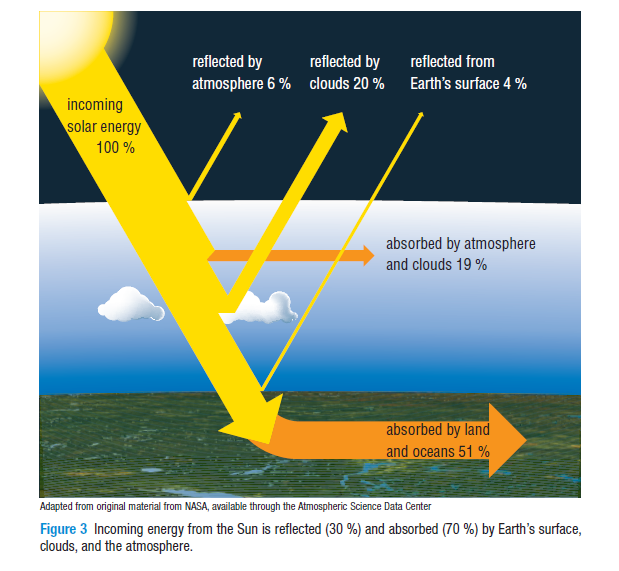
Climate System

* + The complex set of components that interact with each other to produce Earth’s climate
  + These components include:
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – (gases surrounding earth)
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – (liquid water, ice, water vapour)
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ -- (Earth’s rock crust, land surfaces)
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – (plants, animals, microbes etc.)
  + The climate system is powered by the SUN
  + The energy that Earth receives from the sun interacts with the components of the climate system to produce \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_

**Earth Absorbs Energy from the Sun:**

When radiation contacts a particle of matter, one of three things happens:

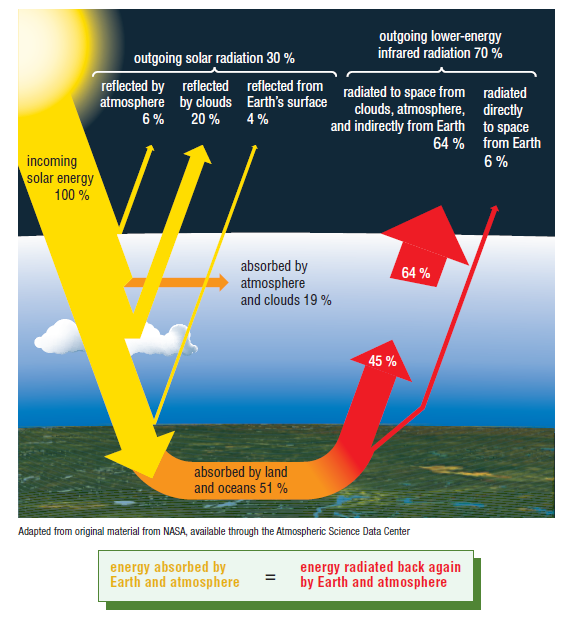
* 1. The radiation may be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by the particle, causing the particle to gain energy
* 2. The radiation may be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ through the particle
* 3. The radiation may be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ off the particle



* If 70% of solar energy that reaches Earth is absorbed, why doesn’t the Earth just heat up tremendously?
* Since the Sun is constantly shining on the Earth and the Earth is constantly absorbing its energy, why does the Earth’s average temperature remain relatively constant?

**Earth's Surface Emits Energy:**

* As the surface of the Earth warms up from the Sun’s energy, it gains \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ energy and then converts it to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (IR) radiation
* The amount of energy \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by Earth’s system is equal to the amount of energy Earth’s system \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from the Sun
* Because of this balance of energy, Earth’s global temperature stays \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_.



**Equilibrium:**

* The balance between energy \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from the Sun and energy \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from Earth ensures that Earth’s global temperature remains fairly constant
* Without a climate system, the Earth would still reach an energy \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, however, Earth would be much \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* The Greenhouse Effect contributes to the Earth not being so cold. Without the climate system’s greenhouse effect, the Earth’s average global temperature would be -18oC instead of 15oC

**Latitude & Climate Zones:**

* The energy from the Sun is \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ near the Earth’s equator since it hits Earth’s surface directly.
* Energy from the Sun is \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ near the two poles since energy hits Earth’s surface at an angle and spreads over a larger area

