17.1 Notes

2014/2015
Atmospheric Characteristics

- **Weather** is constantly changing, and it refers to the state of the atmosphere at any given time and place.
- **Climate** is based on observations of weather that have been collected over many years.
  - Climate helps describe a place or region
Composition of the Atmosphere

Major Components:

- 99% of clean, dry air is composed of nitrogen (78%) and oxygen (21%).
  - There is a lot more nitrogen than oxygen.
- The last 1% is made up of mostly argon and a tiny amount of carbon dioxide.
  - Carbon dioxide plays a significant role in heating the atmosphere.
Variable Components:

- Some important materials that vary in the air from time to time are:
  - **Water vapor** – the source of all clouds and precipitation. It also absorbs radiant heat from the Earth and some solar energy.
  - **Ozone** – three oxygen atoms combined (O₃). It is crucial to life because it absorbs potentially harmful UV radiation from the Sun.
The atmosphere can be divided vertically into four layers based on temperature:

- **Troposphere**: all important weather is located here
- **Stratosphere**: the ozone layer is located here
- **Mesosphere**: temperatures decrease as height increases
- **Thermosphere**: solar radiation is absorbed increasing the temperature as height increases
Earth-Sun Relationships

- The **unequal** heating of the Earth’s surface creates **wind** and drives ocean currents.
- **Seasonal** changes occur because Earth’s **position** relative to the sun continually changes as it travels along its orbit.
  - **Rotation** is the spinning of an object on its own axis.
  - **Revolution** is the movement of an object around another object.
Seasons

- The Earth is tilted 23.5 degrees on its axis.
- Seasons occur based on the orientation of the tilt of the hemisphere to the sun.

Solstices and Equinoxes:

- **Solstice** means the northern or southern hemisphere is tilted toward or away from the sun.
- **Equinox** means that both hemispheres are receiving equal amounts of heat.
Equinox

Solstice
Animations & Video Clip

- [http://esminfo.prenhall.com/science/geoanimations/animations/01_EarthSun_E2.html](http://esminfo.prenhall.com/science/geoanimations/animations/01_EarthSun_E2.html)

- [http://highered.mheducation.com/sites/007299181x/student_view0/chapter2/seasons_interactive.html](http://highered.mheducation.com/sites/007299181x/student_view0/chapter2/seasons_interactive.html)