

Ch 21.3 Climate Changes

>>> **Homework: Read Ch 21.3 by Friday, March 27th** <<<

- Climate is always changing. Some changes are short and other occur over a long period of time. Some causes are natural and others can be human caused.
- **Plate Tectonics** – in the geologic past, changes in land and oceans are due to plate tectonics that caused changes in climate over a very long time.
- **Earth's Orbital Motions** - changes in the shape of the Earth's orbit around the sun and tilt of Earth's axis of rotation affect global climates. Earth's orbit is always elliptical but a change in shape of the elliptical path will have an effect. If the Earth's tilt changes from 23.5 degrees, the Earth's climates would be effected.
- **Ocean Circulation** – changes in circulation can result in short-term climate fluctuation; El Nino.
- **Solar Activity** – a change in the amount of solar radiation over a period of time can change global climates; cool down or warm up.
- **Volcanic Eruptions** – Volcanic ash, dust, and sulfur-based aerosols can increase the amount of solar radiation that is reflected back into space, and causing the atmosphere to cool.

Human Impact on Climate Changes

- The **greenhouse effect** is a naturally occurring process that aids in heating the Earth's surface and atmosphere. If humans were not on the Earth there would still be a natural greenhouse effect.

Global Warming

- The majority of the outgoing infrared radiation (heat) is absorbed by greenhouse gases in the atmosphere before it can be lost to space.
- The absorption of this infrared radiation warms the atmosphere – and there is the problem.
- Greenhouse gases also emit radiation which is extra heat in the atmosphere thus the "greenhouse effect".
- Since the beginning of the Industrial Revolution, the concentrations of many of the greenhouse gases have increased.
- The main greenhouse gas that is causing the problem is carbon dioxide (CO₂). CO₂ is created when carbon containing fuels are burned incompletely from internal combustion engines or from factories.

