

Weather is what conditions of the atmosphere are over a short period of time, and climate is how the atmosphere "behaves" over relatively long periods of time.

Earth's atmosphere is made up of 500km (about 310.69 miles), 80% of the gas in the earth's atmosphere is within 16 km of the world's surface known as the troposphere. The troposphere is where all weather changes occur.

Climate change: Change in the pattern of weather and related changes in climate.

Energy from the sun is the ultimate driver of climate on earth, the solar energy received by the earth depends on how much the sun emits and the distance between the earth and the sun.

Part of the sunlight is reflected directly back to space by the atmosphere, clouds, land, ice and water surfaces.

Aerosols such as deodorants increase the reflection of sunlight. Eventually, the solar energy absorbed by the earth is returned to space as infrared radiation.

In the process, it interacts with the whole climate system---atmosphere, oceans, land surfaces, ice sheets.

The atmosphere is made up of 78% nitrogen and 21% is oxygen and these gases do not interact with infrared radiation.

However, gases in smaller quantities absorb infrared radiation flowing upwards from earth's surface and re-radiate it in all direction including back downwards.

By doing this, they impede the outward flow of infrared energy from earth to space. This is called the greenhouse effect. The gases that cause it by interacting with infrared radiation are known as greenhouse gases.

Greenhouse Gases

1. Carbon Dioxide
2. Water Vapor
3. Methane
4. Nitrous oxide

When the sun emits energy, it leaves as a short wavelength and when it reaches the atmosphere the wavelength becomes longer, some of this energy is emitted back to space, however, most of the energy reacts with gases in the atmosphere and they spread the energy in every direction.

What affects weather/Climate?

The tilt of the earth on its axis, the amount of the sun's radiation, cloudiness and the levels of CO2 in the atmosphere.

The ozone layer or ozone shield is a region of Earth's stratosphere that absorbs most of the Sun's ultraviolet radiation. It contains a high concentration of ozone in relation to other parts of the atmosphere, although still small in relation to other gases in the stratosphere.

Stratospheric ozone is formed naturally through the interaction of solar ultraviolet (UV) radiation with molecular oxygen (O<sub>2</sub>). The "ozone layer," approximately 6 through 30 miles above the Earth's surface, reduces the amount of harmful UV radiation reaching the Earth's surface.

The consequences of global warming are hard to predict due to the number of variables that contribute to global warming.

Consequences can be:

Rare weather events such as droughts and hurricanes will become more common and severe.

Sea-level will increase due to ice melting and as the water in the ocean heats up it expands increasing its volume.

### Climate Changes' Impact on Biodiversity

- Perfectly adapted species will not be able to migrate or adapt to their environment.

### Electromagnetic spectrum

