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## Layers of Atmosphere

The atmosphere are divided into layers based on its temperature, These layers are the troposphere, the stratosphere, the mesosphere and the thermosphere.

### The Troposphere

This is the lowest part of the atmosphere - the part we live in. It contains most of our weather - clouds, rain, snow. In this part of the atmosphere the temperature gets colder as the distance above the earth increases, by about  $6.5^{\circ}\text{C}$  per kilometre. The actual change of temperature with height varies from day to day, depending on the weather.

The troposphere contains about 75% of all of the air in the atmosphere, and almost all of the water vapour (which forms clouds and rain). The decrease in temperature with height is a result of the decreasing pressure.

The lowest part of the troposphere is called the boundary layer. This is where the air motion is determined by the properties of the Earth's surface.

The top of the troposphere is called the tropopause. This is lowest at the poles, where it is about 7 - 10 km above the Earth's surface.

### The Stratosphere

This extends upwards from the tropopause to about 50 km. It contains much of the ozone in the atmosphere. The increase in temperature with height occurs because of absorption of ultraviolet (UV) radiation from the sun by this ozone.

By absorbing dangerous UV radiation, the ozone in the stratosphere protects us from skin cancer and other health damage.

## **The Mesosphere**

The region above the stratosphere is called the mesosphere, the temperature again decreases with height, reaching a minimum of about  $-90^{\circ}\text{C}$  at the "mesopause".

## **The Thermosphere and Ionosphere**

The thermosphere lies above the mesopause, and is a region in which temperatures again increase with height. This temperature increase is caused by the absorption of energetic ultraviolet and X-Ray radiation from the sun.

The region of the atmosphere above about 80 km is also called the "ionosphere", the temperature of the thermosphere varies between night and day and between the seasons, as do the numbers of ions and electrons which are present.

## **The Exosphere**

The region above about 500 km is called the exosphere. It contains mainly oxygen and hydrogen atoms,

## **The Magnetosphere**

The outer region surrounding the earth, where charged particles spiral along the magnetic field lines, is called the magnetosphere, the earth behaves like a huge magnet. It traps electrons (negative charge) and protons (positive), concentrating them in two bands about 3,000 and 16,000 km above the globe - the Van Allen "radiation" belts

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