

THE STRUCTURE OF THE ATMOSPHERE

Hi Friends

In this article, we will explore the five structural layers of the atmosphere and get to know the layers and its characteristics. So friends, fasten your seatbelt; open your mind to capture and focus; to learn more and to enjoy.

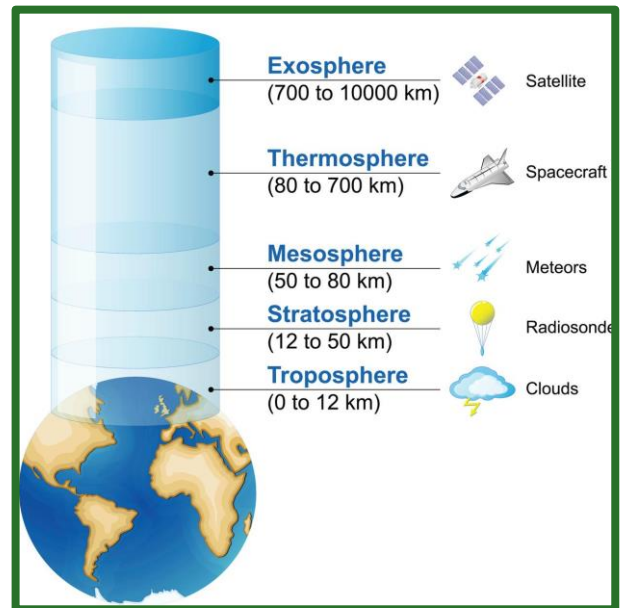
The Troposphere is the first layer above the surface of the Earth and contains half of the Earth's atmosphere. Weather occurs in this layer. Air is constantly moving and as a result aircrafts flying in the air may have a bumpy ride which is called turbulence. The air here is warmer at the surface, simply because the air is warmed by heat given off by the Earth! The farther away from the surface the air moves, the less heat there is to absorb. The highest peak in the world which is Mt. Everest also sits in this layer.

Many jet aircrafts fly in the **stratosphere** because it is very stable. In this region, the air actually warms with height! Moreover, the ozone layer absorbs the harmful ultra-violet rays from the Sun. More rays are absorbed at a higher altitude compared to the lower stratosphere, so the temperature increases.

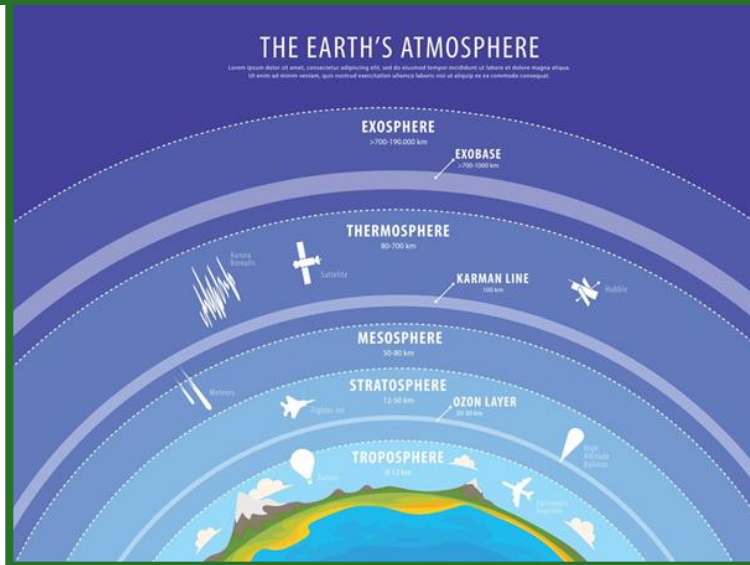
Meteors or rock fragments burn up in the **mesosphere**. In the mesosphere, the temperature decreases with height, because there is very little ozone to warm up the air.

The **thermosphere** is a layer where auroras are found. It is also where the space shuttle orbits. Different regions of the ionosphere (that's the extension of thermosphere) make long distance radio communication possible by reflecting the radio waves back to Earth. The temperature increases again! This time, it is molecular oxygen that causes the temperature to increase. The oxygen absorbs light from the Sun, since there's little air in the thermosphere.

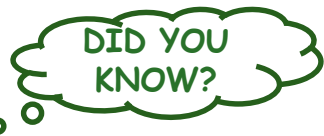
The **exosphere** is the outermost layer of the Earth's atmosphere. It is where satellites are found. The exosphere is almost a vacuum. The air is very, very thin. When air is thin, it does not transfer much heat to objects in the air, even if the air is hot.



Credit: sciencestruck.com



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Facts about the Atmosphere...

- ◆ Another really important fact about the atmosphere is that it protects us from objects coming toward the Earth from outer space.
- ◆ Breathing comes naturally. We need oxygen to keep our bodies working.
- ◆ Nitrogen and oxygen are the main components of our atmosphere. Together they comprise 99% of our atmosphere.
- ◆ The atmosphere is also very important for plants because it contains carbon dioxide. Plants use the carbon dioxide (CO_2) along with sunshine to carry out a process called photosynthesis.
- ◆ The atmosphere allows us to talk to each other. If you were talking to your friend and there were no air between the two of you, your friend would not be able to hear a thing you said.

Life might not be possible on Earth because temperature will not be regulated. We must conserve energy and lessen the use of harmful chemicals. We must plant more trees and be good citizens to our natural resources. By taking environmental action to reduce our energy intake, we are contributing to a healthier and happier world!

'Till next time ...

Lots of Love

The Water Wise Education Team



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References for Newsletter:

- www.aeronomie.be/en/encyclopedia/troposphere-why-it-important-atmospheric-layer
- www.niwa.co.nz/publications/water-and-atmosphere/water-atmosphere
- www.climate.ncsu.edu/edu/Structure-atmospherehaslayers,ishotbutverythin

ACTIVITY: HOW THICK ARE THE LAYERS OF THE ATMOSPHERE?

In this activity you will build a model to represent the different layers of the atmosphere. In addition to the model, you need to draw an accurate diagram in your workbook to represent the thickness of each layer. Use a ruler to draw an accurate scaled diagram.

MATERIALS:

- ◆ large measuring cylinder or tall drinking glass
- ◆ dried split peas
- ◆ popcorn kernels
- ◆ samp
- ◆ beans



INSTRUCTIONS:

- ◆ Add a 0,5 cm layer of dried split peas to represent the troposphere (1 layer of peas thick).
- ◆ Add a 1,5 cm layer of popcorn kernels on top of the peas to represent the stratosphere.
- ◆ Add a 1,5 cm layer of samp on top of the popcorn kernels to represent the mesosphere.
- ◆ Add a 24 cm layer of beans on top of the samp to represent the thermosphere.



Your column should look something like this.

Beans - Thermosphere
Samp - Mesosphere
Popcorn - Stratosphere
Peas - Troposphere



A close-up photograph of the layers.

You will notice that the area where the two layers meet is not always clear cut. The kernels might have mixed a little bit. The atmosphere is the same. There is not a clear line separating two layers, but they mingle in the area of contact.
HAVE FUN MAKING THIS MODEL.

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References for Activity:

- www.siyavula.com/read/science/grade-9/the-atmosphere/26-the-atmosphere

YOUR FEEDBACK

It would be most appreciated if you could please give feedback on this education material by clicking on the following link:

<https://forms.gle/ePtXdPBUjTz4Um5H7>

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