Name: _____ Date: _____

Atmosphere

Science Literacy Article

The **atmosphere** is a mixture of gases that surrounds Earth. These gases include *nitrogen*, *oxygen*, and *carbon dioxide* and are necessary for life. The atmosphere plays an important role in the water cycle and also protects us from objects such as meteors and harmful ultraviolet rays from the Sun. There are five layers to Earth's atmosphere. Here they are from the bottom up:

1. The **troposphere** is the lowest layer of Earth's atmosphere which extends from the surface about 15 kilometers above the surface. The troposphere has the *greatest air pressure* and *density* of all the layers. It is also the layer where most weather occurs. The temperature in the troposphere *decreases about 6.5 degrees Celsius with each kilometer of altitude*. **Altitude** is the height from the ground.

2. The **stratosphere** is next and it extends out from the surface about 50 kilometers. The stratosphere contains the ozone layer. The **ozone layer** is beneficial because it helps absorb most of the ultraviolet radiation from the Sun. The greatest amount of oxygen of all of Earth's layers is located within the stratosphere. Unlike the troposphere, the temperature in the stratosphere *increases with altitude*.

3. The **mesosphere** is the third layer up and is the middle layer of Earth's atmosphere. The mesosphere extends out from the surface about 85 kilometers. The mesosphere is important because it is where meteors and other space debris burns up. The temperature in the mesosphere *decreases with altitude*. In fact, the coldest temperatures in Earth's atmosphere are found near the top of the mesosphere (-90 degrees Celsius).

4. The **thermosphere** is located directly above the mesosphere and is the largest and hottest layer of Earth's inner atmosphere. The thermosphere extends out from the surface of the Earth about 600 kilometers. The temperature of the upper thermosphere can reach *over 2,000 degrees* Celsius.

5. The **exosphere** is located directly above the thermosphere and is the outermost layer of Earth's atmosphere. Therefore, this layer has the *lowest air pressure*. The exosphere extends out from the surface of the Earth into space about 10,000 kilometers. The temperature of the exosphere varies greatly and can range *from 0 degrees Celsius to 1,700 degrees Celsius*.

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Although not considered one of the major layers, there is another sublayer of the atmosphere called the **ionosphere**. The ionosphere overlaps parts of the mesosphere, thermosphere and exosphere. The ionosphere *grows and shrinks based on solar conditions* throughout the day. This layer is important because it contains charged particles called ions which make communication through radio waves possible.

As you have read, the Earth's atmosphere is made up of several layers that all have important characteristics. These layers help to provide living organisms with vital gases that are necessary for life. It helps to maintain Earth's moderate overall temperature and helps feed the water cycle by holding large amounts of water vapor. The atmosphere also protects us from ultraviolet rays from the Sun, space debris, and much more. The atmosphere is essential, and without it, Earth would be a harsh and lifeless planet!

To recap, here are the layers in order and their approximate distances from the surface:

Exosphere	600-10,000 km
Thermosphere	85-600 km
Mesosphere	50-85 km
Stratosphere	15-50 km
Troposphere	0-15 km



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