

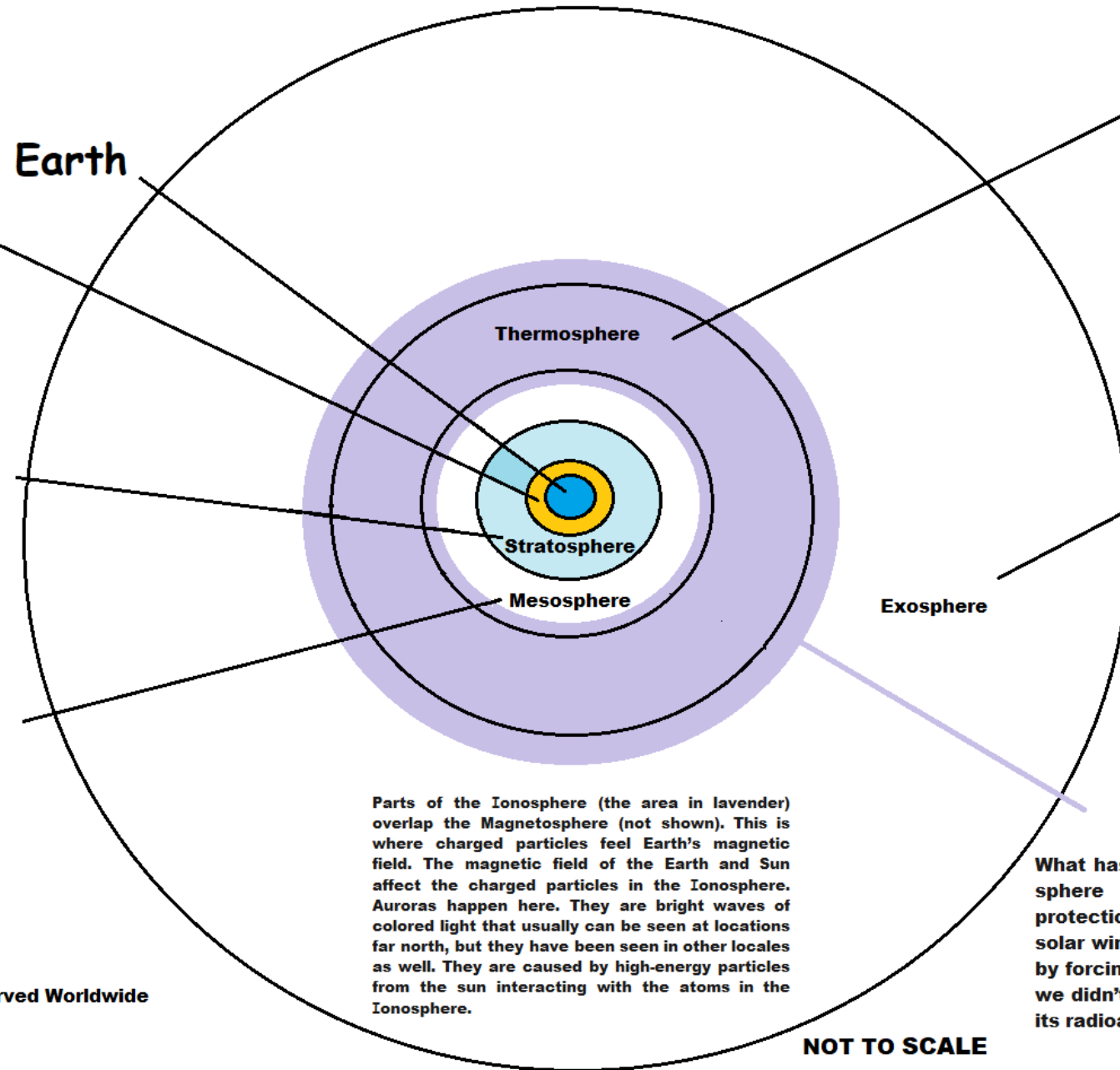
Earth's Atmosphere

NASA.gov says there are 6 layers to the Earth's atmosphere. Closest to the surface is the Troposphere. Tropo means change and our atmosphere here on Earth is constantly changing because of different weather patterns, so the Troposphere includes where the clouds are. The Troposphere is between about 5 and 9 miles or (8 and 14 kilometers) thick.

The next layer above that is the Stratosphere. It is about 22 miles thick or (35 kilometers.) This is where the ozone layer is located. The ozone layer is what protects us from UV radiation coming from the sun. In fact, the ozone layer absorbs MOST of the UV Radiation coming from the sun. We would not be able to live on the planet Earth without this protection.

Then comes the Mesosphere. Meso means middle and it is also about 22 miles or (35 kilometers) thick. It is in the middle of ALL of the layers of the Earth's atmospheres. The air in the Mesosphere is very thin which makes it unbreathable.

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The next layer is called the Thermosphere. This layer is about 319 miles or (513 kilometers) thick. It is where the International Space Station orbits the Earth in 2021. Low Earth orbit satellites can be found here as well. When you measure YOUR temperature YOU use a thermometer, that's because "Thermo" means heat. Well, imagine a temperature that is about as much as 4,500 degrees Fahrenheit! That's how hot it is in the Thermosphere! Even though the temperature is very hot – you would be cold, because this layer doesn't have enough gas molecules to transfer the heat to you. This is why astronauts have to wear special space suits when working outside of the space station in this atmosphere.

The highest layer in the Earth's atmosphere is called the Exosphere. It is about 6,200 miles or (10,000 kilometers) thick. There is no air to breathe and it is very cold in this layer. This layer has gases like Helium and Hydrogen and separates the Earth's layers from the rest of outer space.

The 6th layer, the Ionosphere, overlaps part of the Mesosphere, Thermosphere, and the Exosphere. This layer absorbs energy from the Sun and because of that, it can become larger or smaller. Solar radiation excites gases within these layers to form "Ions" which hold an electrical charge.

What has been called the "Magnetosphere," is really NOT a sphere at all. It DOES have a spherical influence of protection over all of the Earth. It protects Earth from the solar wind and radioactive particles that come from the sun by forcing them to go AROUND Earth, instead of hitting it. If we didn't have the Magnetosphere, the sun's solar wind and its radioactive particles would destroy our atmosphere.

Parts of the Ionosphere (the area in lavender) overlap the Magnetosphere (not shown). This is where charged particles feel Earth's magnetic field. The magnetic field of the Earth and Sun affect the charged particles in the Ionosphere. Auroras happen here. They are bright waves of colored light that usually can be seen at locations far north, but they have been seen in other locales as well. They are caused by high-energy particles from the sun interacting with the atoms in the Ionosphere.

NOT TO SCALE

Resources

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