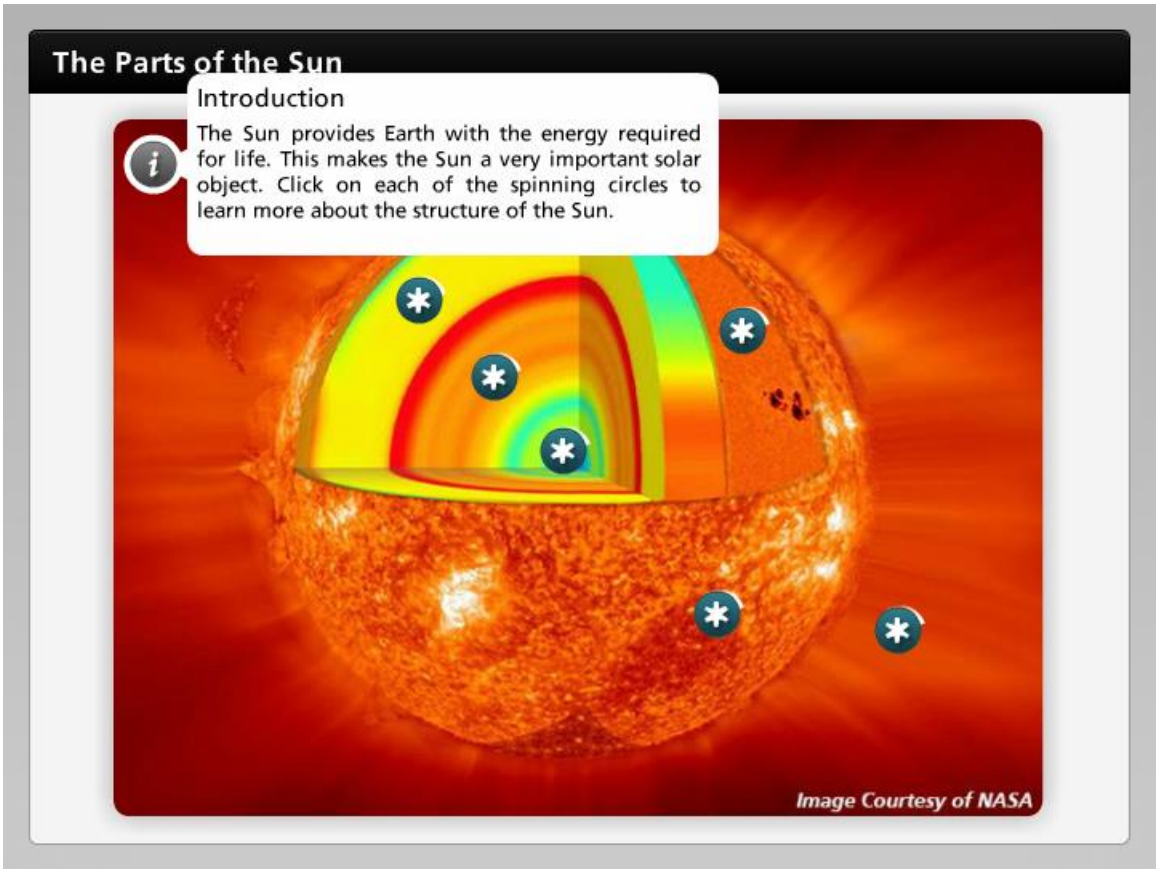
Module 4: Astronomy – The Solar System
Topic 2 Content: The Parts of the Sun Notes

Introduction



The Sun provides Earth with the energy required for life. This makes the Sun a very important solar object. Click on each of the spinning circles to learn more about the structure of the Sun.

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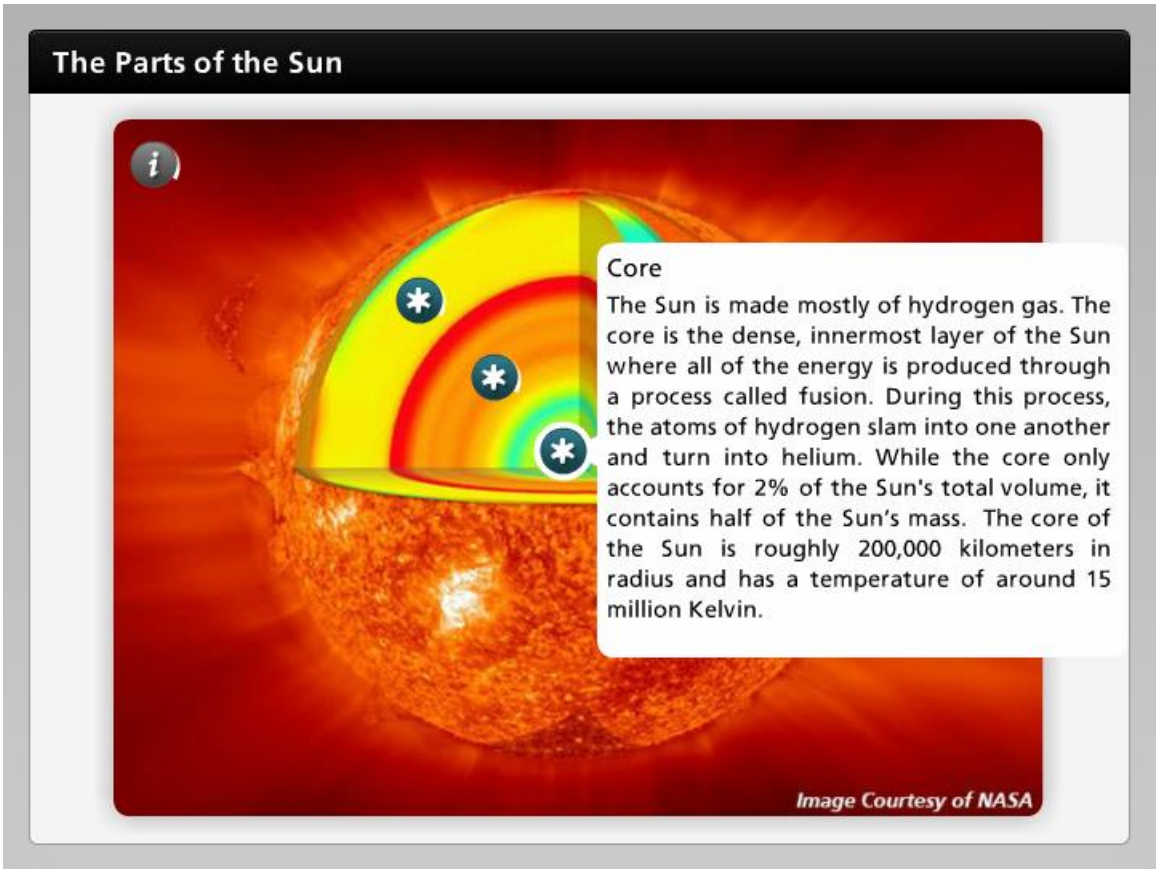
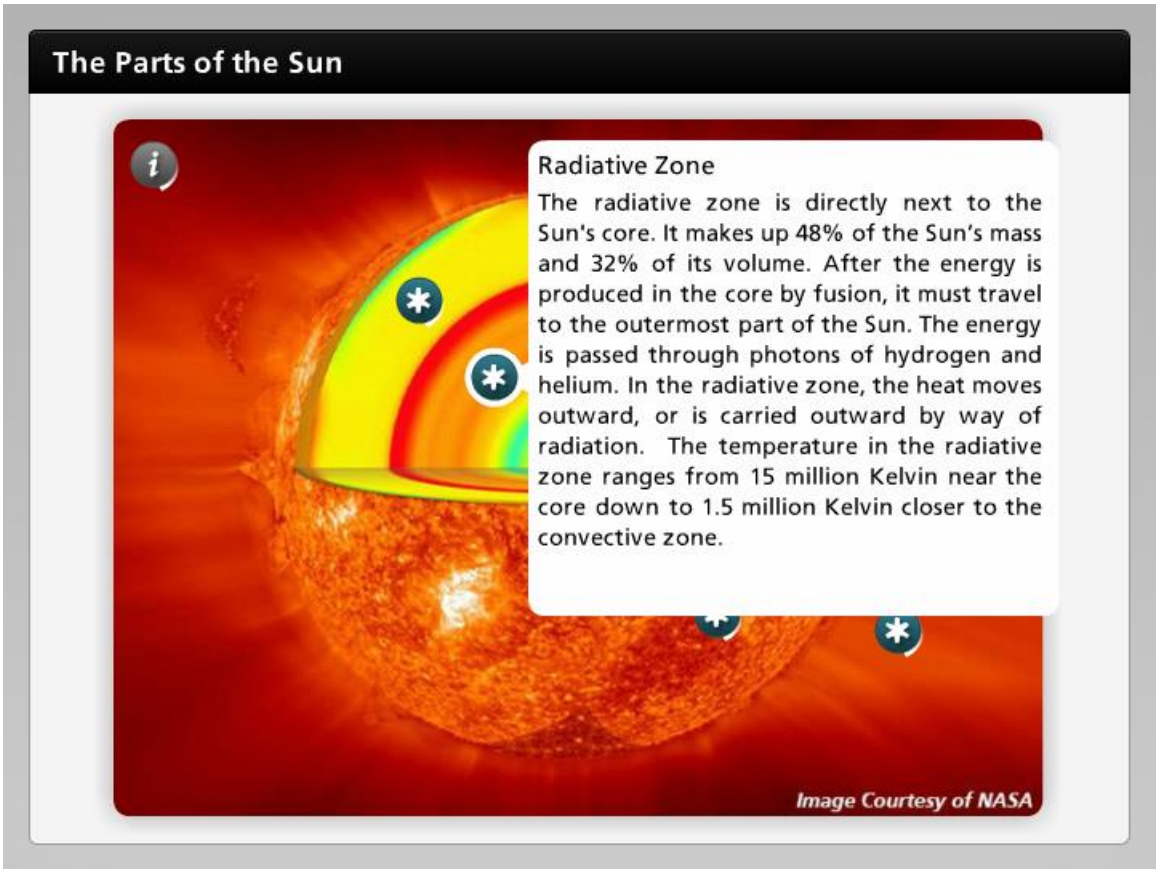
Core



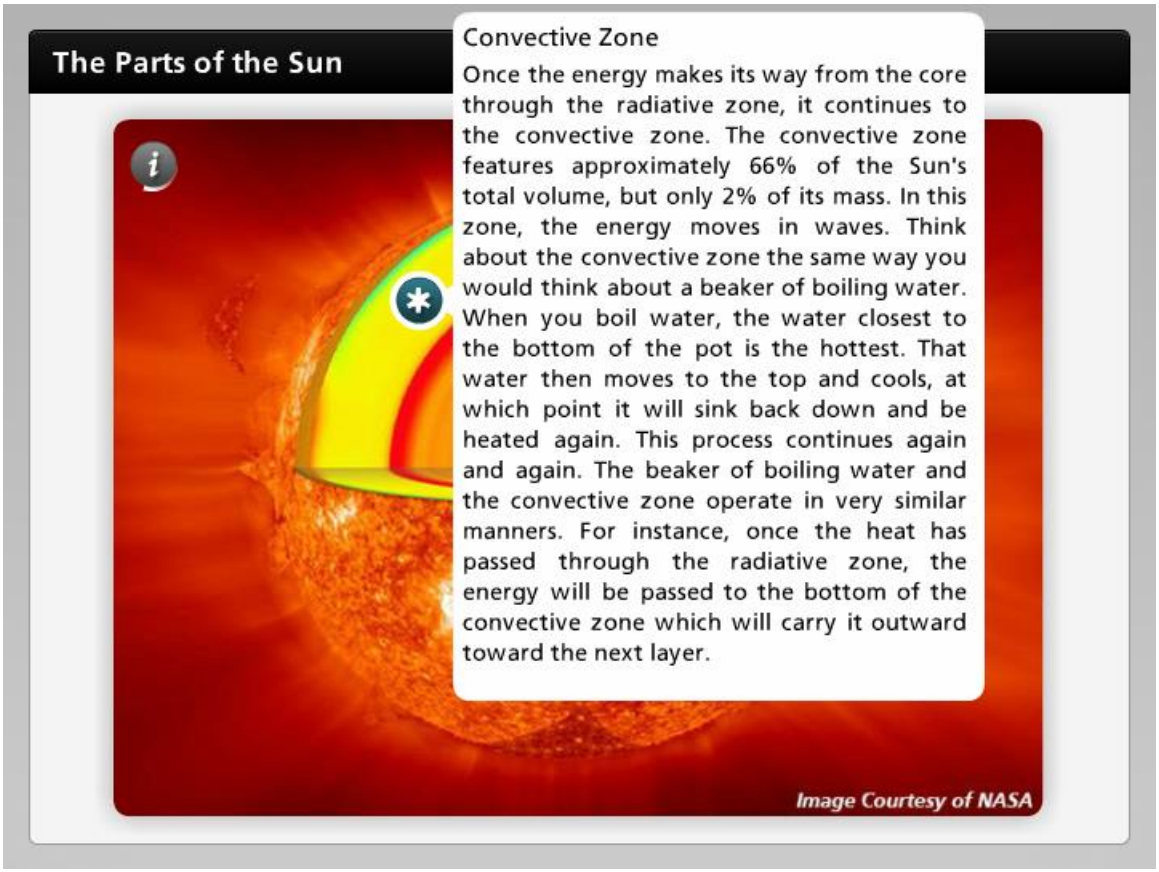
The Sun is made mostly of hydrogen gas. The core is the dense, innermost layer of the Sun where all of the energy is produced through a process called fusion. During this process, the atoms of hydrogen slam into one another and turn into helium. While the core only accounts for 2% of the Sun's total volume, it contains half of the Sun's mass. The core of the Sun is roughly 200,000 kilometers in radius and has a temperature of around 15 million Kelvin.

Radiative Zone



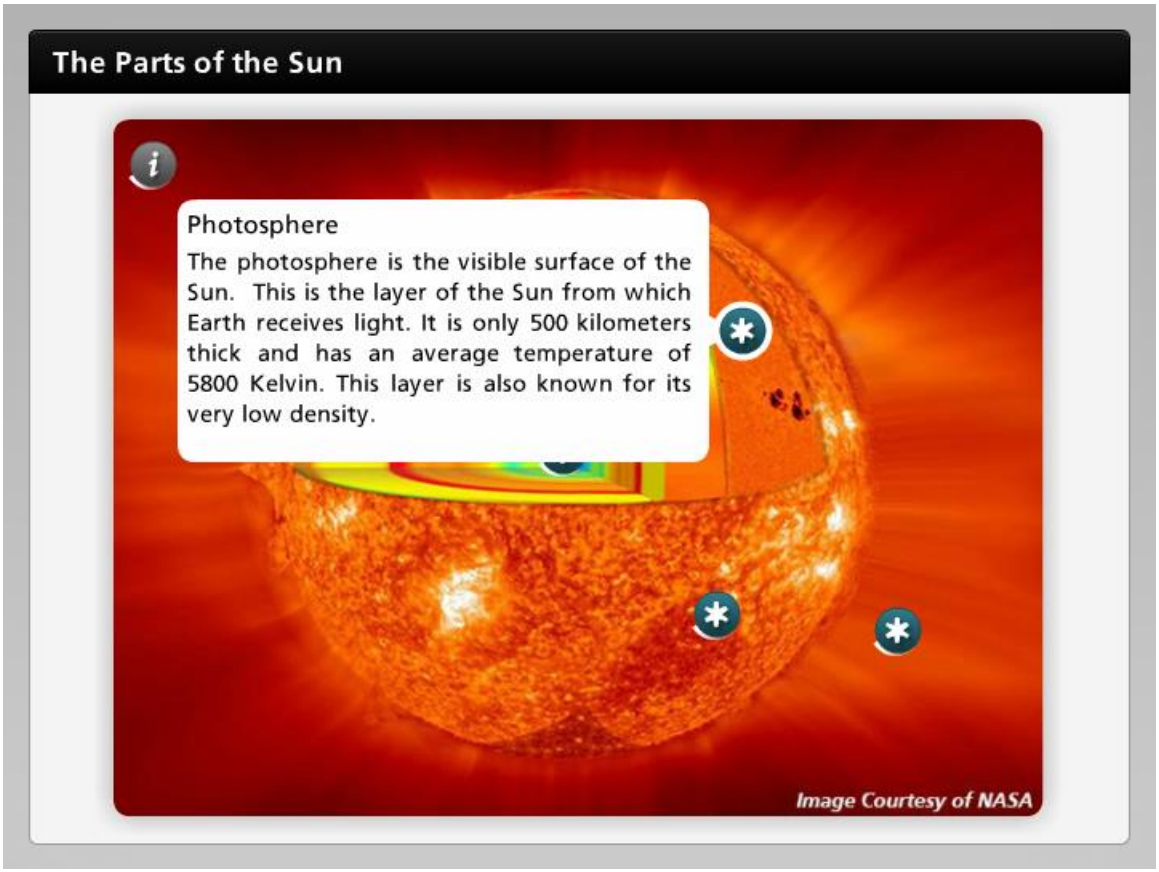
The radiative zone is directly next to the Sun's core. It makes up 48% of the Sun's mass and 32% of its volume. After the energy is produced in the core by fusion, it must travel to the outermost part of the Sun. The energy is passed through photons of hydrogen and helium. In the radiative zone, the heat moves outward, or is carried outward by way of radiation. The temperature in the radiative zone ranges from 15 million Kelvin near the core down to 1.5 million Kelvin closer to the convective zone.

Convective Zone



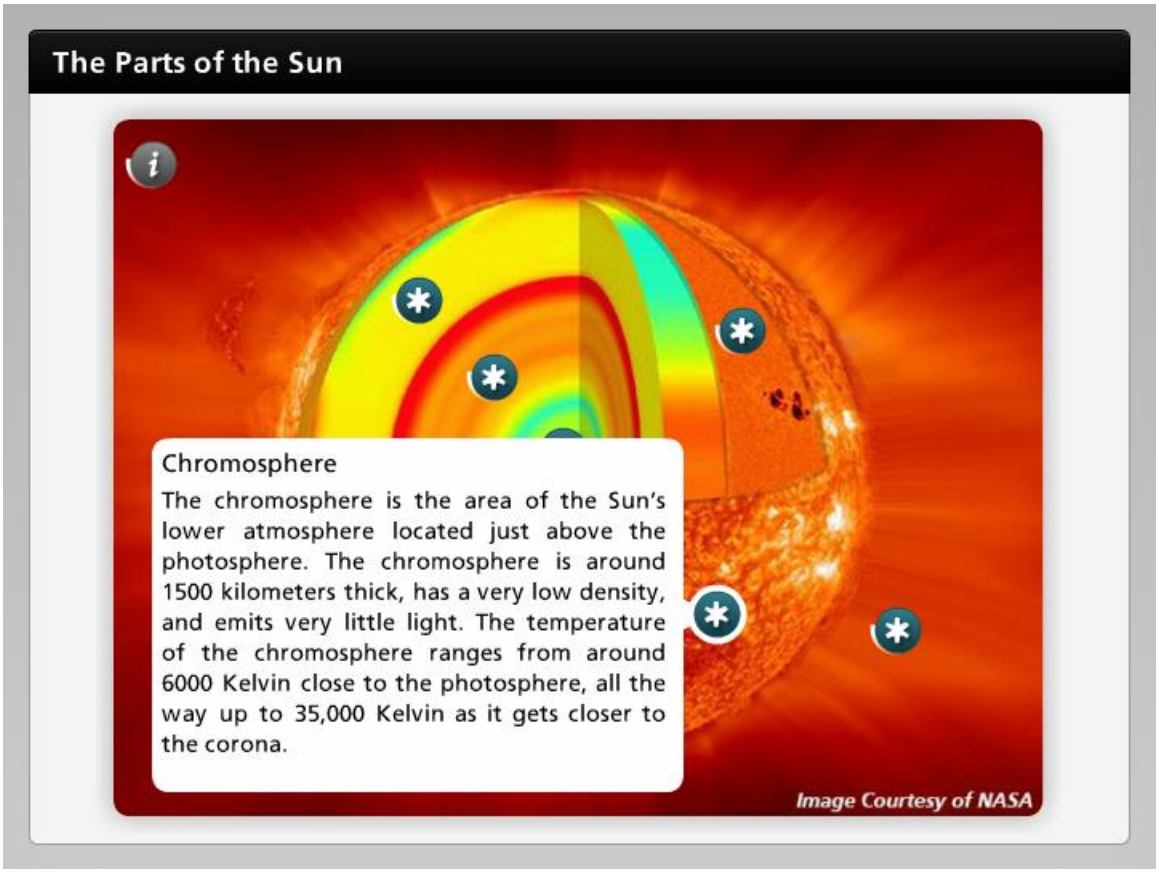
Once the energy makes its way from the core through the radiative zone, it continues to the convective zone. The convective zone features approximately 66% of the Sun's total volume, but only 2% of its mass. In this zone, the energy moves in waves. Think about the convective zone the same way you would think about a beaker of boiling water. When you boil water, the water closest to the bottom of the pot is the hottest. That water then moves to the top and cools, at which point it will sink back down and be heated again. This process continues again and again. The beaker of boiling water and the convective zone operate in very similar manners. For instance, once the heat has passed through the radiative zone, the energy will be passed to the bottom of the convective zone which will carry it outward toward the next layer.

Photosphere



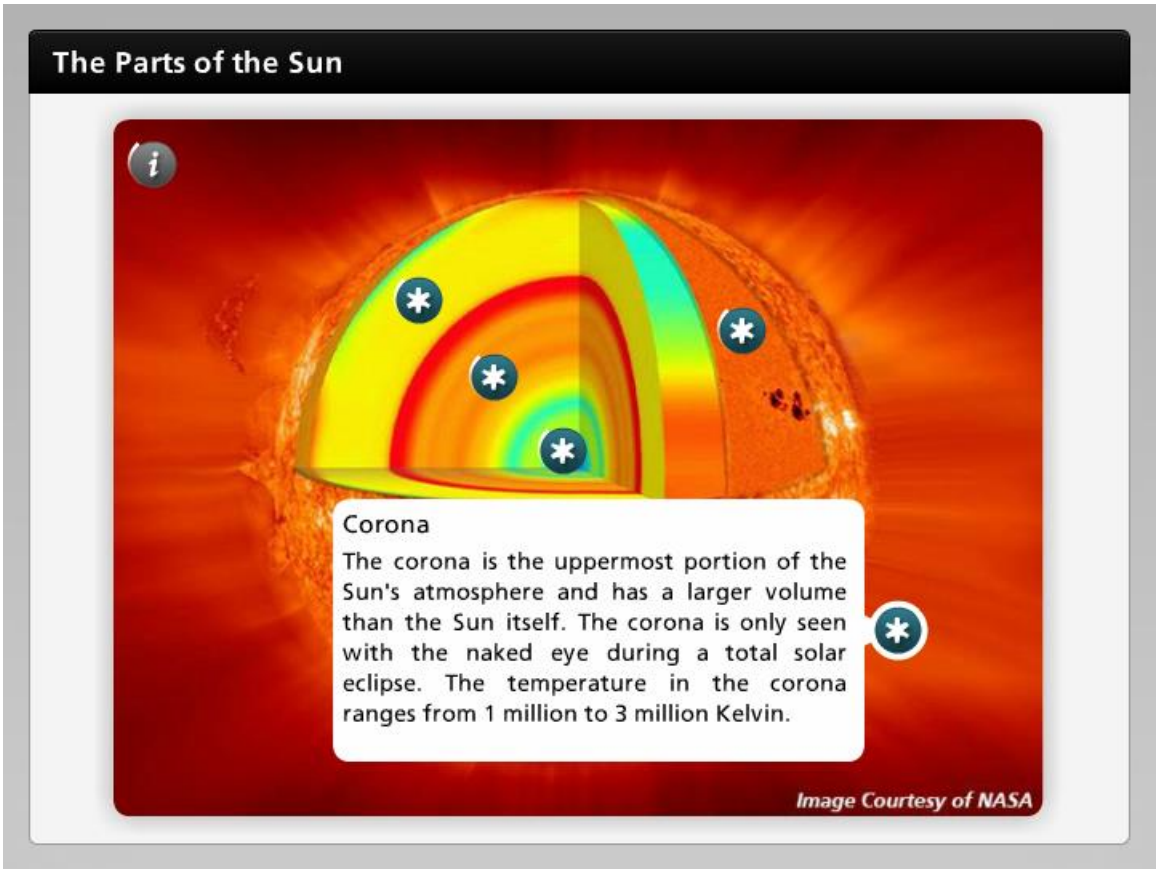
The photosphere is the visible surface of the Sun. This is the layer of the Sun from which Earth receives light. It is only 500 kilometers thick and has an average temperature of 5800 Kelvin. This layer is also known for its very low density.

Chromosphere



The chromosphere is the area of the Sun's lower atmosphere located just above the photosphere. The chromosphere is around 1500 kilometers thick, has a very low density, and emits very little light. The temperature of the chromosphere ranges from around 6000 Kelvin close to the photosphere, all the way up to 35,000 Kelvin as it gets closer to the corona.

Corona



The corona is the uppermost portion of the Sun's atmosphere and has a larger volume than the Sun itself. The corona is only seen with the naked eye during a total solar eclipse. The temperature in the corona ranges from 1 million to 3 million Kelvin.