



## **The Life Cycle of a Star**

Today, stars are known as the center of life. Our star, the Sun, gives Earth energy, and in a sense, life for all organisms to live. Without the Sun, we would not be here. Did you ever wonder how our Sun was formed? In this document, we all can see how a star is born, the changes it undergoes, as well as how it ends.

First how is a star made? A star is a big ball of gas that gives off heat and light. There are many stars in the sky, so we have many types of stars that have many differences, but also some similarities. Stars are formed by the force of gravity acting on space dust. These particles of dust and gas begin to collect together, and begin the formation of a star, or what we call a Nebula. Nebulas are made mostly of Hydrogen gas which is essential for a star later in life. These clouds of hydrogen gas that will eventually make the Sun are very cold to begin with. The temperature of a newly forming nebula is approximately -440 degrees Fahrenheit. We know the cloud doesn't begin to form all by itself; gravity brings all the particles together to form the nebula. The force of gravity pushing and pulling the dust and cloud together starts chemical and nuclear reactions. These reactions are what heat up the nebula and start the formation of a star.

As the cloud heats up and starts to glow, a protostar is formed. A protostar is an irregularly shaped star that has not formed into a spherical ball of gas yet. Once it becomes more stable and takes on a spherical shape, like a ball, it is then called a star. This star is like our Sun today. Compared to other stars, it is somewhat medium sized, and yellow in color. Stars produce light and energy by converting Hydrogen into Helium. This reaction continues until there is no more hydrogen left in the star. When the star runs out of its fuel, it will then grow larger. These stars are called red giants. This happens because the star begins to cool down and starts to contract. As a red giant, the star begins consuming the Helium that was produced and starts to make Carbon.

Once all of the Helium is used up, it turns into a smaller star called a white dwarf. These small stars are about the size of the Earth. These stars are very hot and dense. The star remains as a white dwarf for a very long time. Once the white dwarf has cooled, it turns into a black dwarf and is no longer visible. Scientists are unsure exactly what happens after this process, but they do believe that our sun will take another 5 billion years before it even becomes a red giant. As you can see the life cycle of a star takes billions of years to complete, so we don't need to worry about our Sun disappearing anytime very soon.