The Life Cycle of a Star

A gas cloud, if big enough, starts to shrink. The density and temperature increase so nuclear fusion can start. This is when Hydrogen is turned into Helium. The "burning" of Hydrogen stops the gas cloud from shrinking. At this point, the gas cloud becomes a star. This is the current state of our Sun.

After billions of years, most of the Hydrogen fuel has been "burned", and the star begins to shrink again. The star has to use another source of fuel, Helium.

The next stage in the life of a star is called a red giant. The star here is much bigger than it was initially (that's why it's called a giant star!). When the red giant star runs out of fuel, the star begins to shrink again. This contraction heats up the core of the star enough so that elements like Iron can be made. When the star runs out of this last type of fuel, it has neared the end of its life.

The star begins to throw off layers because it can't support them anymore. This is called a planetary nebula. The core of the star becomes a white dwarf. This is an extremely dense star the size of a planet. Finally, when the white dwarf has used all its energy, it stops shining and becomes a "black dwarf", a dead star.

For stars with higher masses than the Sun (up to about 40 times greater), the outer layers of the star may be thrown off with much more force. This is a supernova. This type of star collapses down to a very compact size. This is what is called a "neutron star".

Stars bigger than 40 times the Sun may become a "black hole".
Instructions

Using the handout (front and back), make a diagram showing the life cycle of stars. Your guide is the picture on the handout.

You will need:

- 11 x 17 sheet of paper
- Red, yellow, and blue colored pencils (no markers!)
- Template with chart objects

On the 11 x 17 paper, lightly sketch your life cycle diagram. You want this to be light because you want to lay out your stars before you make your final diagram.

*Please note:* You are not allowed to cut out the nebula and planetary nebula. Use the examples on the template and draw them on your paper.

Color the Sun yellow, the red giant and red supergiant stars red, and the blue star blue.

Cut out your stars and lay them on the diagram. Once you have placed them on your diagram, glue them on. Complete you diagram.