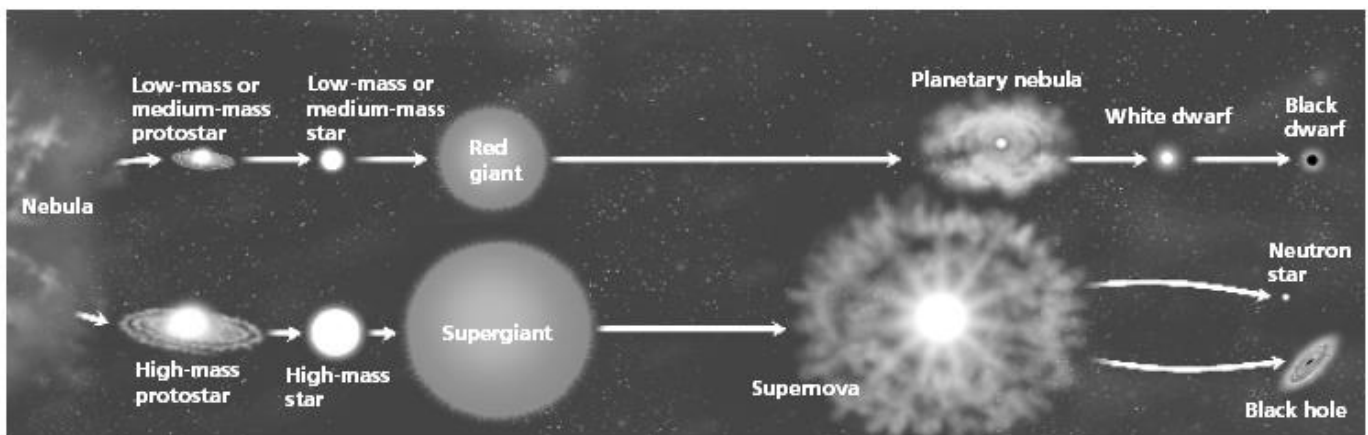


# Life Cycle of a Star - Worksheet

## A STAR IS BORN – STAGES COMMON TO ALL STARS

All stars start as a **nebula**. A **nebula** is a large cloud of gas and dust. Gravity can pull some of the gas and dust in a nebula together. The contracting cloud is then called a **protostar**. A protostar is the earliest stage of a star's life. **A star is born when the gas and dust from a nebula become so hot that nuclear fusion starts.** Once a star has “turned on” it is known as a **main sequence star**. When a main sequence star begins to run out of hydrogen fuel, the star becomes a **red giant** or a **red super giant**.



## THE DEATH OF A LOW OR MEDIUM MASS STAR

After a low or medium mass star has become a red giant the outer parts grow bigger and drift into space, forming a cloud of gas called a **planetary nebula**. The blue-white hot core of the star that is left behind cools and becomes a **white dwarf**. The white dwarf eventually runs out of fuel and dies as a **black dwarf**.

## THE DEATH OF A HIGH MASS STAR

A dying red super giant star can suddenly explode. The explosion is called a **supernova**. After the star explodes, some of the materials from the star are left behind. This material may form a neutron star. **Neutron stars** are the remains of high-mass stars. The most massive stars become **black holes** when they die. After a large mass star explodes, a large amount of mass may remain. The gravity of the mass is so strong that gas is pulled inward, pulling more gas into a smaller and smaller space. Eventually, the gravity becomes so strong that nothing can escape, not even light.

## Question Sheet

Just like living things and humans, stars have a life cycle, which consists of birth, growth, development, middle age, old age, and death. The life cycle of a star spans over billions of years.

### Section One - Sequencing

The stages below are not in the right order. Number the stages in the correct order.

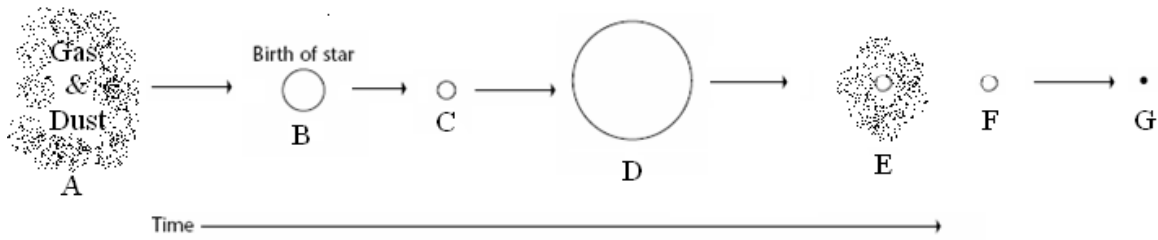
- \_\_\_\_\_ The star begins to run out of fuel and expands into a **red giant** or **red super giant**.
- \_\_\_\_\_ Stars start out as diffused clouds of gas and dust drifting through space. A single one of these clouds is called a **nebula**
- \_\_\_\_\_ What happens next depends on the mass of the star.
- \_\_\_\_\_ Heat and pressure build in the core of the **protostar** until **nuclear fusion** takes place.
- \_\_\_\_\_ The force of gravity pulls a nebula together forming clumps called **protostars**.
- \_\_\_\_\_ Hydrogen atoms are fused together generating an enormous amount of energy igniting the star causing it to shine.

### Section Two - Vocabulary

Match the word on the left with the definition on the right.

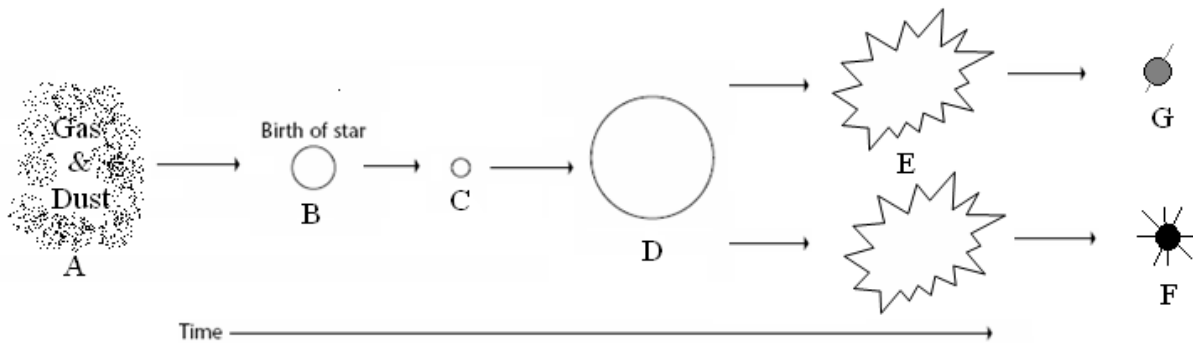
- |                           |  |
|---------------------------|--|
| _____ <b>black dwarf</b>  | e. star left at the core of a planetary nebula                   |
| _____ <b>white dwarf</b>  | g. a red super giant star explodes                               |
| _____ <b>nebula</b>       | c. what a medium-mass star becomes at the end of its life        |
| _____ <b>protostar</b>    | b. a large cloud of gas or dust in space                         |
| _____ <b>supernova</b>    | a. exerts such a strong gravitational pull that no light escapes |
| _____ <b>neutron star</b> | d. the earliest stage of a star 's life                          |
| _____ <b>black hole</b>   | f. the remains of a high mass star                               |

### Section Three – Understanding Main Ideas - Low Mass Star



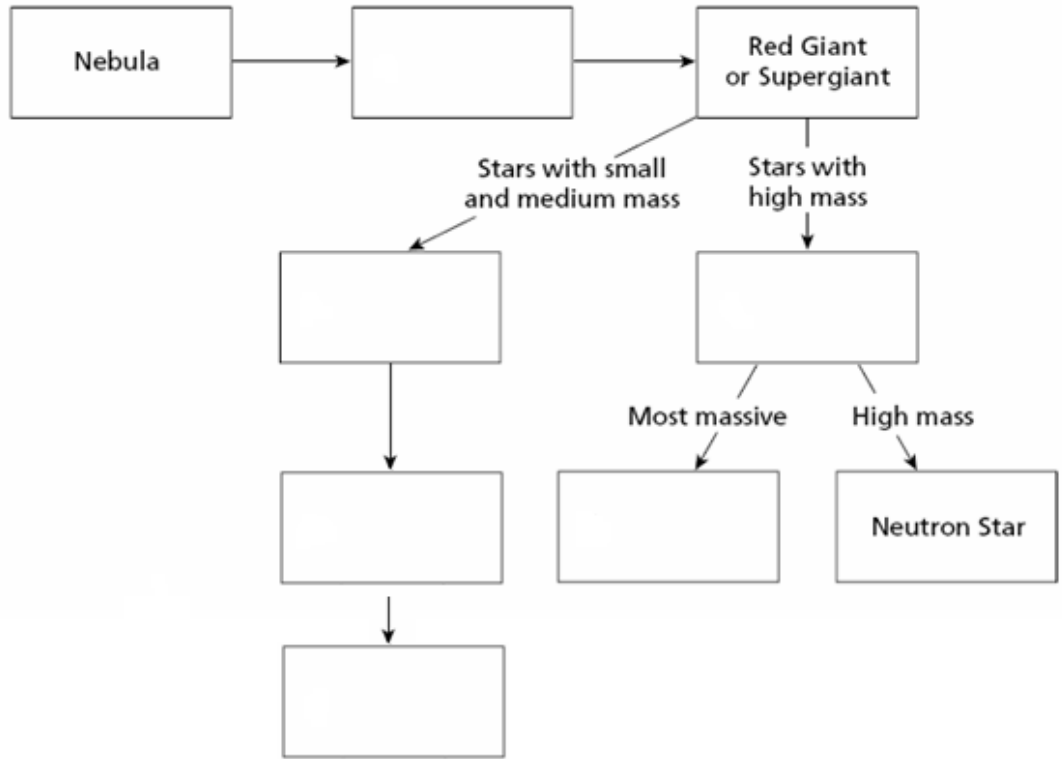
- \_\_\_ 1. Red giant
- \_\_\_ 2. Where fusion begins
- \_\_\_ 3. Nebula
- \_\_\_ 4. Black hole
- \_\_\_ 5. The stage the sun is in
- \_\_\_ 6. White dwarf
- \_\_\_ 7. Planetary Nebula

### Section Four – Understanding Main Ideas - High Mass Star



- \_\_\_ 1. Black Hole
- \_\_\_ 2. Supernova
- \_\_\_ 3. Protostar
- \_\_\_ 4. Gravity causes this to condense into a protostar
- \_\_\_ 5. Main sequence star
- \_\_\_ 6. When a star begins to run out of fuel and grows larger
- \_\_\_ 7. Neutron star

**Section Five – Graphic Organizer – Putting it all Together**



**Section Six – Venn Diagram - Compare and Contrast**

Venn Diagram - Life Cycle of a Star

