



## **Life cycle of Stars**

Complete the gaps about the **Birth of Stars and Lifecycle of stars**.

<ul style="list-style-type: none"><li>➤ <b>hydrogen</b></li><li>➤ <b>protostar</b></li><li>➤ <b>outward</b></li><li>➤ <b>nebula</b></li><li>➤ <b>gravity</b></li><li>➤ <b>dust</b></li><li>➤ <b>equilibrium</b></li><li>➤ <b>black</b></li><li>➤ <b>longer</b></li><li>➤ <b>matter</b></li></ul>	<ul style="list-style-type: none"><li>➤ <b>collapses</b></li><li>➤ <b>energy</b></li><li>➤ <b>fuse</b></li><li>➤ <b>dwarf</b></li><li>➤ <b>giant</b></li><li>➤ <b>planets</b></li><li>➤ <b>sequence</b></li><li>➤ <b>main sequence</b></li><li>➤ <b>gravitational</b></li><li>➤ <b>faster</b></li></ul>
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### **Birth of a star**

Stars form when enough \_\_\_\_\_ and gas clump together because of \_\_\_\_\_ forces. This cloud is called a \_\_\_\_\_. When a nearby star explodes, a shock wave travels through the nebula causing it to shrink and divide into even smaller swirling clouds. As the cloud \_\_\_\_\_, energy is released, which causes it to heat up. The centre of the cloud, called the \_\_\_\_\_, gets hotter and hotter to about 10 million degrees or more. Most of the gas in interstellar clouds is \_\_\_\_\_ and at such high temperatures, the hydrogen nuclei start to combine, or \_\_\_\_\_ together. This fusion reaction produces enormous amounts of \_\_\_\_\_ as light, heat and other radiation. When this happens, the collapsing cloud starts to shine and so a star is "born".

The disc of dust and gas left over after the star is formed continues to rotate around the star and clumps together because of gravitational forces to form \_\_\_\_\_, which continue to orbit the star.

The \_\_\_\_\_ "pressure" of the radiation coming from the core of the new star acts against the matter that is collapsing under \_\_\_\_\_. Eventually the two forces balance each other, and the collapse ceases. The star settles down and begins to shine steadily. It is now called a \_\_\_\_\_ star as it is stable due to the inward and outward forces being in \_\_\_\_\_. It takes a star the size of the Sun about 50 million years to reach this state.

The hottest stars are blue-white in colour and fusion of hydrogen into helium takes place much \_\_\_\_\_. For a small yellow star like our Sun, the fusion reaction is slower - meaning that it can remain as a main

sequence star for much \_\_\_\_\_. In our Sun's case it is estimated to be a 10 000 million years. Proxima Centauri, the closest star to the Sun, uses hydrogen more slowly as it is a smaller cooler, red star so it will have a longer main \_\_\_\_\_ than the Sun.

### **Life cycles of stars**

Stable stars like the Sun change during their lifetime when their hydrogen has run out to form a red \_\_\_\_\_ and then a white \_\_\_\_\_. A star larger than our Sun will form a red super giant ending in a supernova and a neutron star or perhaps a \_\_\_\_\_ hole. The fate of a star depends upon how much \_\_\_\_\_ it contains.

*Answer the following questions:*

1. What is a nebula?

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2. What causes the fusion reaction to start inside a protostar?

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3. When does a protostar become a main sequence star?

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4. What are the planets formed from?

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5. Which stars will have a shorter main sequence than the Sun?

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6. How long is the main sequence period of the Sun estimated to be?

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7. What will happen to our Sun after it has used up its hydrogen?

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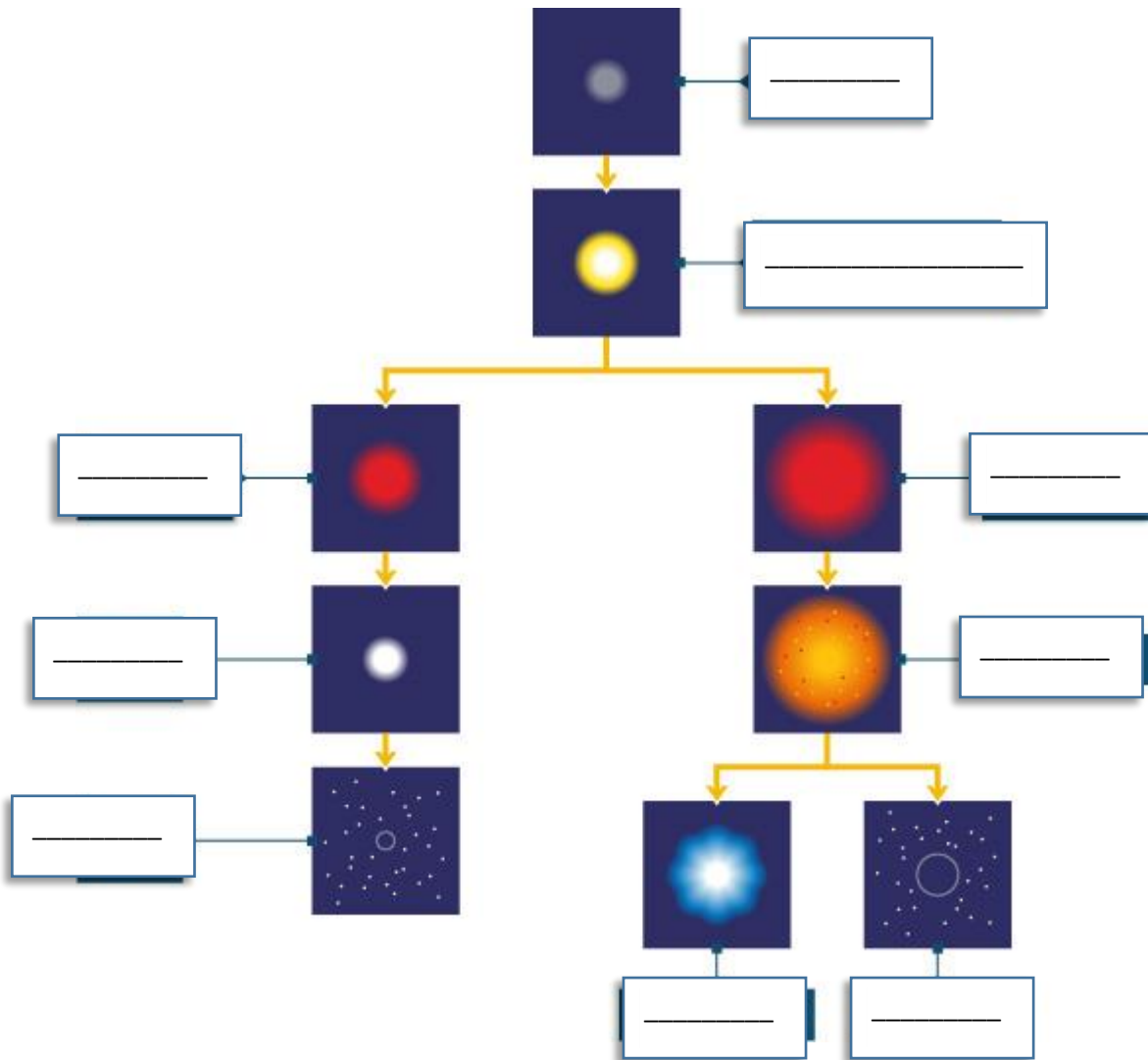
8. What happens to stars larger than our sun at the end of their main sequence period?

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## Life cycles of stars

A star goes through a life cycle. This is determined by the size of the star. The diagram below summarises the stages you need to know. **Please complete this diagram using text boxes.**



### Stars about the same size as our Sun

These follow the left hand path:

Main sequence star → red giant → white dwarf → black dwarf

### Stars much bigger than our Sun

These follow the right hand path:

Main sequence star → red super giant → supernova → neutron star or black hole