

## Life of Stars Factsheet

### The birth of a star



Star formation in dwarf galaxy NGC 1569  
(Image Credit: ESA/ISO)

Stars are born in clouds of dust and gas which start to clump together under their own gravity. As the mass of the clumps increase, the gas becomes more squashed and eventually becomes hot enough for nuclear fusion of hydrogen to take place. Fusion releases a lot of energy, which we can measure as heat and light radiation.

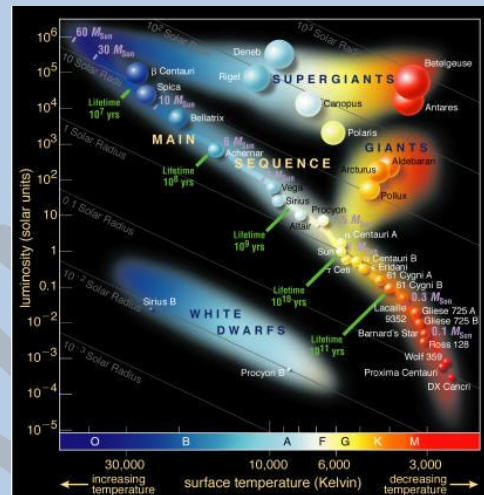
### Our middle-aged star

The Sun is about half-way through its life, at around 5 billion years old. We know from its size, that in another 5 billion years, the Sun will have exhausted its supply of hydrogen. When this happens it expands to become a red giant – swallowing up Mercury and Venus. Eventually, the Sun will then collapse down into a small, and very dense white dwarf – then cooling over billions of years to become invisible.

Bigger stars have shorter lifetimes but are very bright, smaller stars are dim but last for a very long time. A diagram showing the brightness of different stars through their

lifetime, is called a Hertzsprung–Russell diagram.

Stars larger than the Sun may end their lives as very dense neutron stars, or even black holes. Their final collapse is after a massive explosion, called a supernova, from which new stars, planets and life can be born.



Hertzsprung-Russell Diagram  
(Image Credit: universetoday.com)

## ACTIVITY – Walking out the life of a star

Draw out the axes of a large H-R diagram using chalk outside – about 5 metres square.

Research the path that the Sun takes on the diagram over its lifetime on the diagram. Mark out the path in chalk.

Find out the same information for other stars on the image above and plot their paths using different colours.