# 27B Star Life Cycle and the H-R Diagram

*How can we use an H-R diagram to know where a star is in its life cycle?*

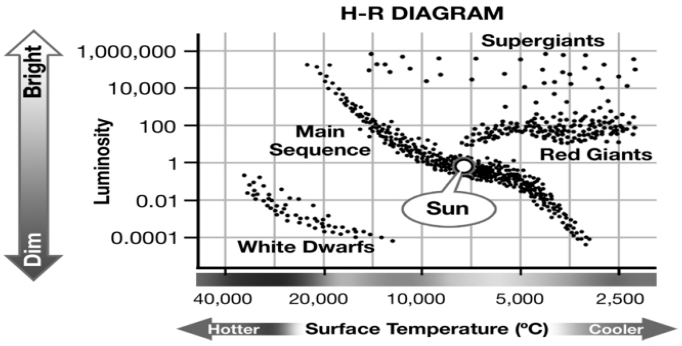
Just like humans, stars go through a life cycle. Over the course of their lives, stars change in ways that make each stage different and recognizable. A useful way to organize this information is in a Hertzsprung-Russell diagram, also called an H-R diagram. In this investigation, you will learn how to identify stars of different types and ages using the information in an H-R diagram.

*Materials*

- None required

## 1 The H-R diagram

For astronomers, a graph that displays a star's luminosity on the y-axis and its surface temperature on the *x*-axis sets up an extremely useful diagram called a Hertzsprung-Russell, or H-R diagram. In 1910 Ejnar Hertzsprung and Henry Norris Russell discovered that when all of the known stars were put on their graph, several obvious groups became apparent. By examining the differences in these groups, later astronomers were able to realize that the groups were best described as stars in different periods in their life cycle, rather than completely different types of stars. Just as infants, adolescents and adults are in different stages of the human life cycle, main sequence, red giants, supergiants, and white dwarfs are stars in different stages of the life cycle of stars.




## 2 Making observations

**a.** Describe the qualities and the location of white dwarf stars based on the H-R diagram.