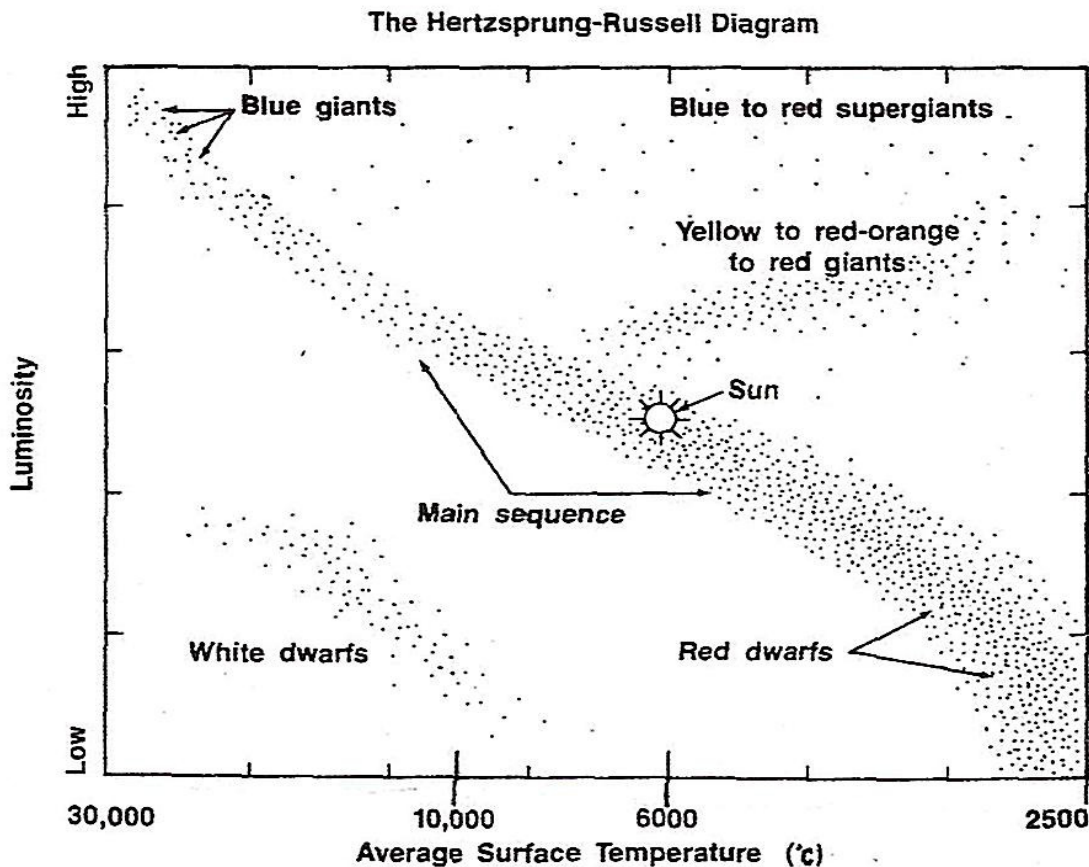


# Worksheet: Stars and the H-R Diagram

## COORDINATED SCIENCE 1

**Background:** The *Hertzsprung-Russell diagram* is actually a graph that illustrates the relationship that exists between the average surface temperature of stars and their absolute magnitude, which is how bright they would appear to be if they were all the same distance away. Rather than speak of the brightness of stars, the term "luminosity" is often used. **Luminosity** is a measure of how much energy leaves a star in a certain period of time. Generally, for stars that are at equal distances from the Earth, the more luminous a star, the brighter it is.

The luminosity of stars is affected not only by temperature but also by size. The most luminous stars are affected not only by temperature but also by size. The most luminous stars would be those that are large and hot. Those that are the least luminous would be small and cool. The color of a star is determined by its surface temperature, which is illustrated on the Hertzsprung-Russell diagram.



### **Answer the questions using the above HR Diagram**

1. What is the approximate surface temperature of the sun?
2. Would the surface temperature of white dwarf stars be **higher** or **lower** than red supergiants? (Circle one of the bold words)

3. What is the **color** of the stars with the highest surface temperature?
4. What is the **color** of the stars with the lowest surface temperature?
5. List the **color** of the stars from hottest to coldest:
6. Most of the stars on the **HR Diagram** are classified as which type of star?
7. How is it possible for white dwarf stars to have lower luminosity than the sun even though the sun is cooler than white dwarfs?
8. **Plot** the following stars.
  - Star A** = 4,000 °C and low/medium brightness
  - Star B** = 6,000 °C and high brightness
  - Star C** = 20,000 °C and low/medium brightness
  - Star D** = 6,000 °C and medium brightness

Identify the **type/color** for each star:

STAR	COLOR	TYPE
Star A		
Star B		
Star C		
Star D		

9. What is the name of our most popular star located at point **D**?
10. Describe the characteristics of stars in the area called Main Sequence. What do all types of stars located here have in common?