
LAB 7

Star Classification

Purpose

The purpose of this lab is to have you identify the main characteristics used to classify stars, and the five main types of stars. You will also become familiar with the use of the Hertzsprung-Russell diagram used for the classification of stars.

Materials

graph paper

colored pencils

Procedure

Using the data from Table 7–1 and the blank Hertzsprung-Russell diagram in Figure 7–1, plot the position of each star using its approximate temperature and luminosity. Label each star's name next to its data point on the chart.

TABLE 7–1 Star Temperature and Luminosity

Star	Temperature (°C)	Luminosity (compared to the sun)
Rigel	14,000	50,000
Betelgeuse	3,500	12,000
Polaris	6,500	1,000
Aldebaran	4,000	100
Barnard's Star	3,000	0.002
Alpha Centauri A	6,000	3
Sun	6,000	1
Procyon B	6,600	0.01
Sirius B	8,300	0.01
Sirius A	10,000	20
Vega	9,700	60
Tau Ceti	5,000	0.5
Alpha Centauri B	4,300	0.3
Regulus	12,300	300
Achernar	16,700	1,000
Spica	19,700	800
Beta Centauri	21,000	1,200

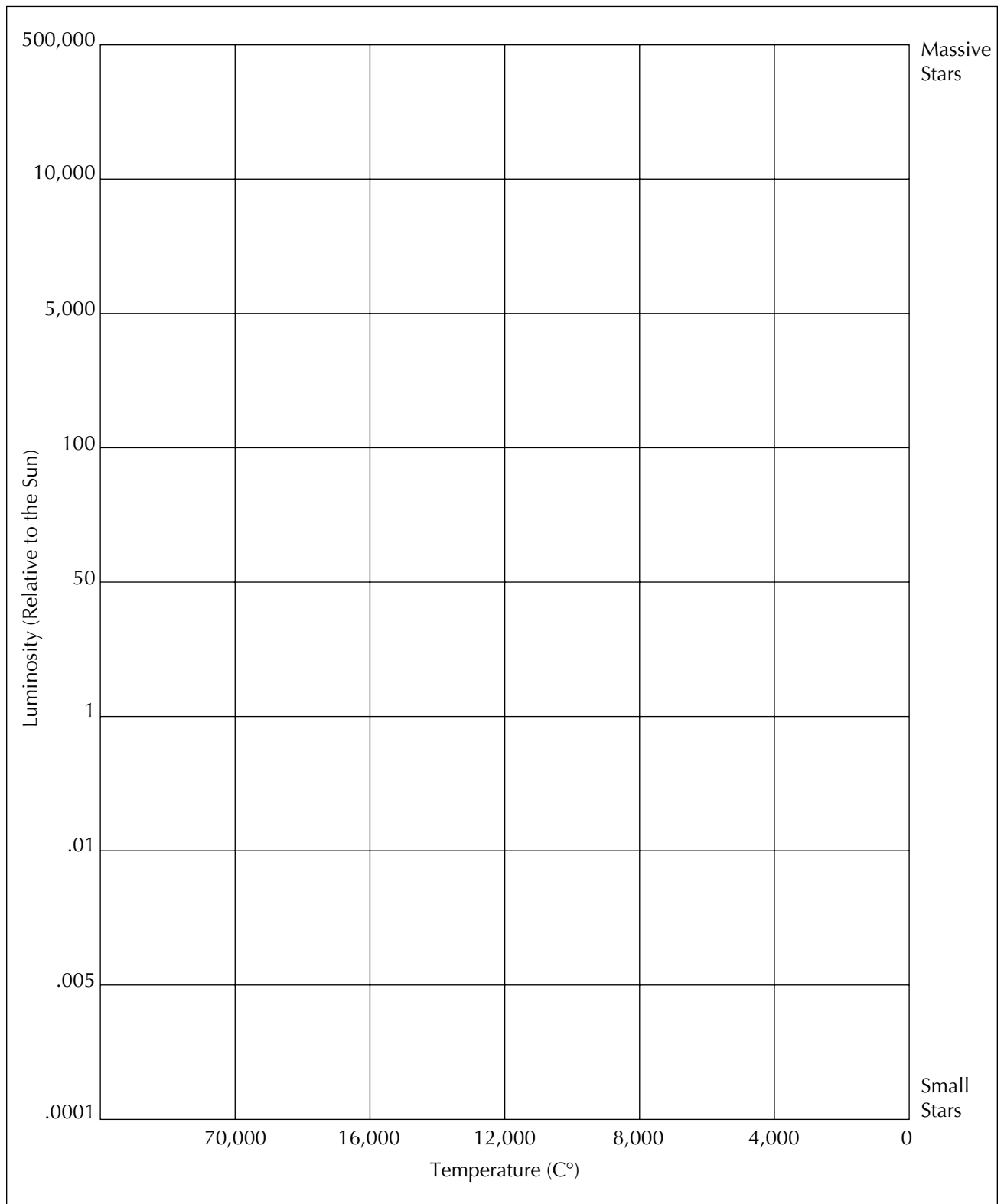


FIGURE 7-1 The Hertzsprung-Russell Diagram

Using the information provided in Table 7–2 and colored pencils, shade in each temperature region of the Hertzsprung-Russell diagram with the correct star color.

In bold letters, label the following regions of your Hertzsprung-Russell diagram: White Dwarfs, Red Dwarfs, Red Giants, Main Sequence Stars, and Blue Supergiants.

Star Temperature (°C)	Star Color
2,000–4,000	Red
4,000–5,000	Orange
5,000–6,000	Yellow
6,000–7,500	Pale Yellow
7,500–11,000	White
11,000–22,000	Pale Blue

Conclusions

1. As a star changes color from red to blue, describe what happens to its surface temperature.
2. The Hertzsprung-Russell diagram classifies stars by which four properties?
3. A main sequence star that is 10,000 times more luminous than the sun most likely has a temperature of:
4. A main sequence star that has a luminosity of 100 is most likely to be what color?
5. A white dwarf star with a temperature of approximately 10,000 degrees C would have a luminosity of:
6. A massive star with a temperature of 20,000 degrees C and a luminosity of nearly 1,000,000 would be classified as what type of star?
7. What is the temperature and luminosity of the sun?
8. The sun is brighter than which two star types?