

Stars From Afar

Purpose: Compare the temperature and brightness of various stars. Students will plot values on a graph.

Materials:

- pencil
- colored pencils
- ruler

Procedure:

1. Using the data from the Stars from Afar-Star Chart (pg. 2), plot stars on the H-R Diagram.
2. Make a pencil dot to represent stars on the Create an H-R Diagram (pg.3).
3. Plot the values of all the stars. Some of the values are not indicated on the H-R diagram; therefore, you will have to use approximations when plotting these stars.
4. After all stars are labeled and graphed, use your colored pencils to shade in portions of the graph. The colors of the graph will depend on the temperature range.
 - Red: 2,000 K–3,500 K
 - Orange-Red: 3,500 K–5,000 K
 - Yellow-White: 5,000 K–7,500 K
 - Blue-White: 7,500 K–11,000 K
 - Blue: 11,000 K–30,000 K plus

Follow-Up Questions:

Due to the color appearance of stars, they are known as red giants or white dwarfs. Red giants tend to be 100 times bigger than our Sun, but they are much cooler. On the other hand, white dwarfs are roughly the same size as the Earth, yet they are much hotter than the Sun. Complete the following steps using the following information

1. Find the four red giants, approximately 100 times the size of our Sun (Sun is 1.0 solar luminosity.), in the red portion of the graph. Circle them, and label the group of stars “Red Giants”.
2. Find the three white dwarfs in the blue-white portion of the graph. They are the hottest and dimmest stars. Circle them, and label the groups of stars “White Dwarfs”.
3. Find the four brightest stars, and circle them. Label the group of stars “Supergiants”.
4. The remaining stars that are located in an area from the upper left to the lower right are called the main sequence stars. Circle and label them “Main Sequence”.
5. What happens to the temperature as you move to the right of the diagram?

6. What happens to the brightness as you move from top to bottom on your diagram?

Stars From Afar

Star Chart

Name of Star	Surface Temperature (K)	Absolute Magnitude (M)
11 Ursae Minoris	4,340	- 0.4
Achenar	14,510	-2.8
Aldebaran	4,010	-0.6
Alpha Centuri	5,790	+5.4
Alpha Coronae Borealis A	9,700	+0.2
Alpha Coronae Borealis B	5,800	+5.1
Altair	7,700	+2.2
Antares	3,500	-5.3
Arcturus	4,300	-0.3
Barnard's star	3,134	+13.2
Betelgeuse	3,200	-6.1
Deneb	8,525	-7.2
Pollux	4,865	+1.1
Procyon B	7,740	+13.04
Regulus	15,400	+11.6
Rigel	11,000	-6.7
Sirius A	9,940	+1.4
Sirius B	25,200	+11.2
Spica	22,400	-3.6
Sun	5,778	+4.8
Vega	9,620	+0.6

Stars From Afar

