EARTH SCIENCE 11
EXERCISE 4.

PURPOSE: To study a method by which the types of stars can be determined.

In 1912, two astronomers, Hertzsprung (in Holland) and Russell (in USA), independently studied the relationships between the temperature and luminosity for a large group of stars. These properties were plotted on a graph which led to the discovery that stars exist as only a few types and not as a range of all possible combinations of temperature and luminosities. This graph became known as the H - R Diagram and a great deal of modern astronomy is based on it.

PROCEDURES:

On the grid provided plot the temperature and luminosity of the stars listed and marked with a " * ". Do not join the points with a line.

QUESTIONS:

1. Examine the axis of the graph. How are they numbered? Is this the normal method of numbering? Why is this method used here?

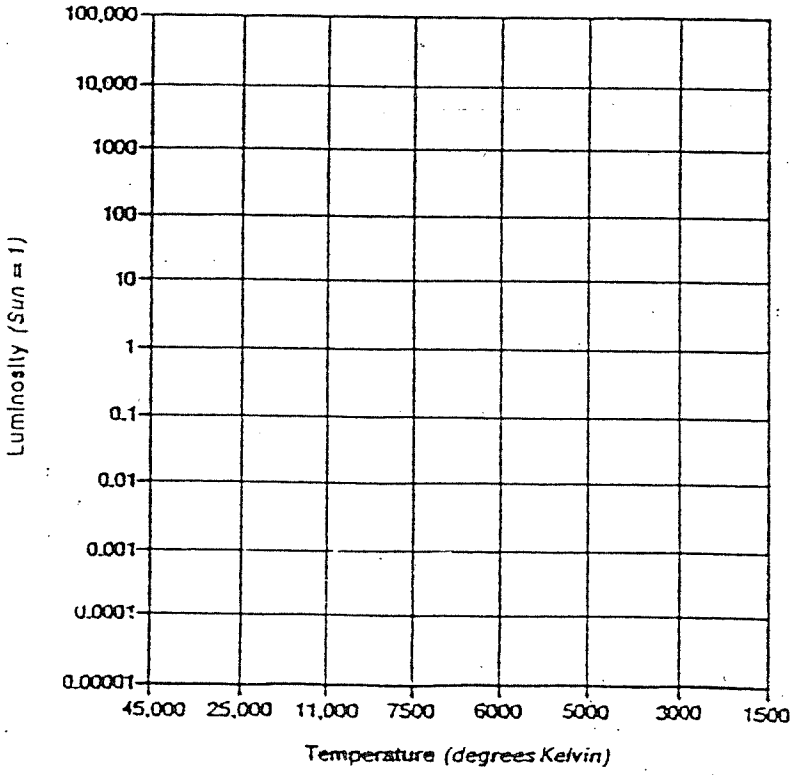
2. Where is the sun located on the graph?

3. Describe the shapes produced by the groupings of points.

4. Where do most of the points fit on the graph?

5. Where is the smallest group of stars located on the graph?

6. What is the significance of the H-R diagram to modern Astronomy?



EARTH SCIENCE 11
ASTRONOMY
WORK SHEET

STAR TYPES

1. What do the initials H and R stand for in the H-R diagram?
2. What properties of the stars are plotted on the axis of the H-R diagram?
3. Where do most of the stars fit in the diagram?
4. Why must the stars in the upper right of the diagram be very large stars?
5. Why must the stars in the lower left of the diagram be very small stars?
6. What color must the stars on the right edge of the diagram be? Why?
7. What color must the stars on the left edge of the diagram be? Why?
8. Name a red supergiant star. Name a red giant star. Name a blue-white giant star.
9. How are the temperature and luminosity linked for stars in the main sequence?
10. The temperature of stars is measured in degrees Kelvin. What is the Kelvin scale? (you will need to look in a reference source for this.)