Investigating Stars Name:_____Block:_____

The Hertzsprung-Russell Diagram **E3:A4**

Stars come in many colors and sizes. Although multiple characteristics could be used to sort them, the diagram you will be investigating in this activity will focus on the brightnesses and temperatures of stars.

1. Examine the star circles provided by your teacher. Each circle has the following information:

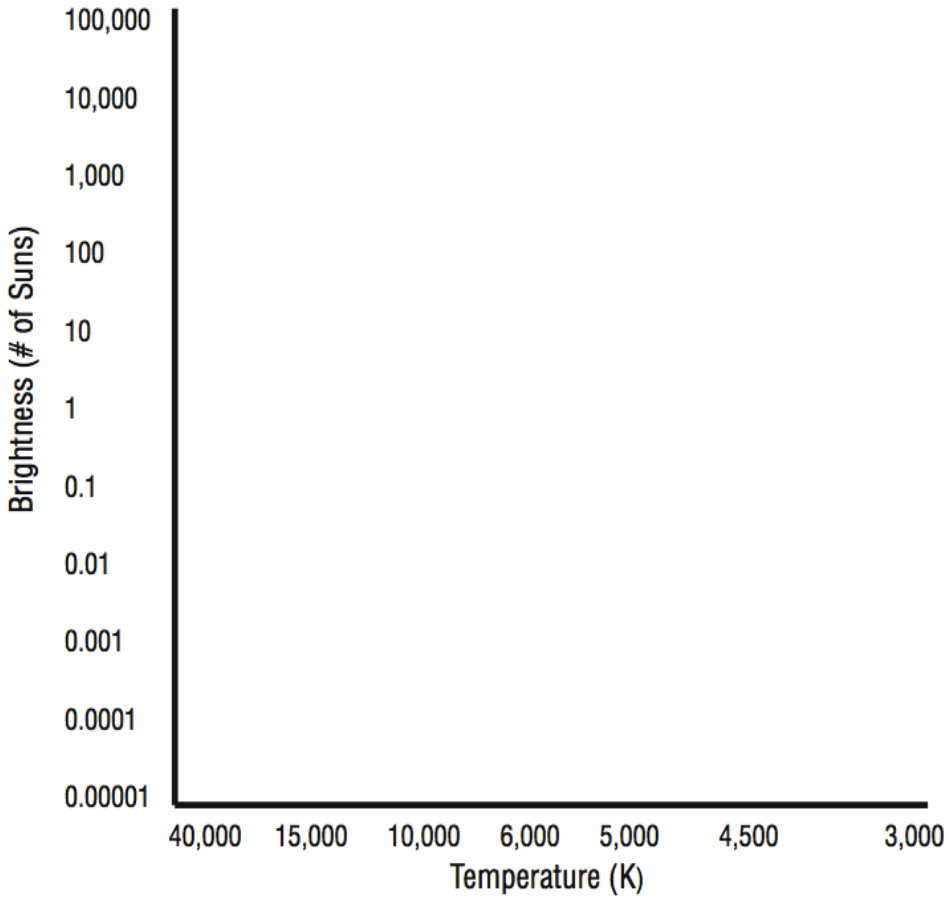
Star Name—the common, or catalog name of the star. NOTE: Some stars were named long ago by the ancients (Aldebaran, Betelguese), and some were named based on the catalog in which they appear (HD/HDE = Henry Draper catalog, BD = Bonner Durchmusterung catalog). Some of the names on the star circles are made up.

Brightness—the number of times brighter the star is than our sun (a fraction means it is dimmer than our sun)
Temperature—the surface temperature of the star in K
Lifetime—the number of years stars of this type are expected to exist at this color and brightness

2. Attach your circles to the wall chart, positioning them as accurately as possible on the temperature and brightness axes. Discuss any trends you observe on the wall chart.

3. Use the space below to sketch a similar graph to the one you made as a class and circle regions that correspond to types of stars. Label the 7 star types (OBAFGKM) on the graph.

Star Chart Template



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4. Read FYI: *The Hertzsprung-Russell Diagram*. Complete the reading guide and questions after reading. When everyone has completed this, go on to #5.

5. How is the pattern of stars similar to the pattern of cars in from Activity E3:A2?

6. What type of stars are the most abundant in the universe? What color are they?

7. Describe the general trend between temperature and brightness. In other words, for most stars as temperature increases, what happens to brightness?

8. What is the color and brightness of the rarest stars?

9. What are the characteristics of the stars that do not conform to the graph's trend (that lie off the main sequence)?

10. In terms of the graph's trend, is our sun typical or exceptional?

11. If you were to replace the temperature scale on the graph's x-axis with a color scale, which color would be closest to the graph's origin and which would be farthest away?

12. Considering the stars that fit the general trend (called main sequence stars), what relationship do you notice between color and expected lifetime?