

HERTZSPRUNG-RUSSELL DIAGRAM Name: _____

- Problem:**
- 1) Can the size of a star be determined by its temperature and luminosity?
 - 2) Can an H-R diagram be used to chart the life cycle of a star?

Procedure: You have been given a table containing information about 15 stars and a chart containing a H-R diagram.

1. Draw in dividing lines between each of the temperature categories shown above the H-R diagram. Color in each of these categories with the appropriate shade. *(already done)*
2. You should notice 3 distinct groups of stars on the H-R diagram, one running diagonally across the chart and two in separate corners of the chart. The stars in the group that runs diagonally across the chart are part of the Main Sequence - label this on the chart. Also Label the following: Red giants, White dwarves, Blue giants, Red dwarves.
3. Plot each star onto the H-R diagram. *(as has been done for Hadar)*
4. Fill in the spectral color and star type for each star on the data table. *(as has been done for Hadar)*

Questions:

1. List the colors of stars from the color of the hottest star to the color of the colder star: _____

2. What color are the stars in the group in the top right corner of the H-R diagram? _____

3. What color are the stars in the group at the bottom left portion of the diagram? _____

4. What color(s) are the stars in the group seen diagonally across the center of the diagram? _____

5. How do the red giant stars differ from the white dwarf stars in terms of absolute magnitude and temperature?

6. What is the range in absolute magnitude of the main sequence stars?

7. The sun is part of which group on the H-R diagram? _____

8. What is the surface temperature of the sun? _____

For the remaining questions circle the most appropriate term in the parenthesis.

- 9. Although its temperature is greater, our sun has a lower absolute magnitude than that of (Arcturus, Mintaka).
- 10. Supergiants are stars with relatively (high, low) temperatures and high absolute magnitudes.
- 11. Red giants (are, are not) main sequence stars.
- 12. The absolute magnitude of Hadar is (higher, lower) than that of the sun.
- 13. The temperature of Sirius B is (higher, lower) than the sun.

THE HERTZSPRUNG-RUSSELL DIAGRAM AND PROPERTIES OF STARS

NAME: _____

1. The Spectral Classification chart shown below identifies the different colors of stars. Each color corresponds to a different range of temperatures on the HR Diagram on the next page. **Color the sections of the HR diagram** the appropriate color that corresponds to spectral class and surface temperatures.

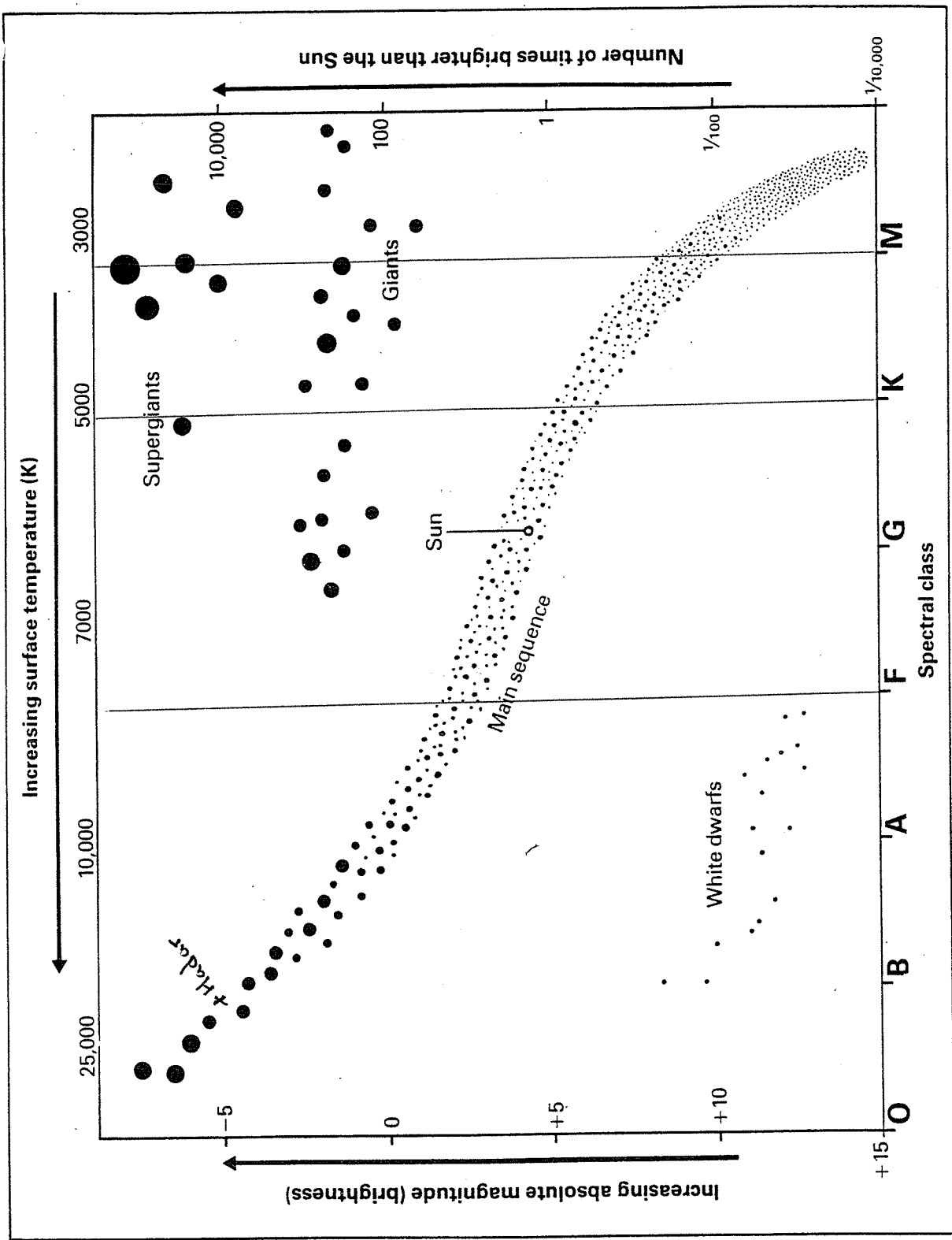
Spectral classifications	
Class	Color
O	blue
B	bluish-white
A	white
F	yellowish-white
G	yellow
K	orange
M	red

2. Use the HR Diagram to locate the stars listed in the table below.
- Plot the positions of the stars on the diagram and label them with their names.
 - Complete the table by identifying each of the stars as a white dwarf, main sequence, giant, or supergiant star based on its position on the HR Diagram. Also identify the color of the star based on its spectral class and surface temperature.

Star	Surface temperature, K	Absolute magnitude	Type of star	Spectral color
Hadar	21 000	-5	<i>main sequence</i>	<i>bluish white</i>
Sirius A	10 400	+1.4		
Sirius B	10 700	+11.6		
Arcturus	4 500	-0.3		
Antares	2 900	-4.5		
Altair	8 000	+2.2		
Ross	2 800	+13.3		
Beta Pegasi	2 000	-1.4		
Capella	5 900	- .7		
Van Maanen's	800	+10.4		
Bernard's	2 600	+13.2		
Pollux	4 100	-1.0		
Procyon	6 500	+2.8		
Betelgeuse	2 700	-5.6		
Mintaka	21 000	-5.1		

Hertzprung-Russell diagram

01.046



Stars' spectral classes
O, B, A White or bluish white
F, G Yellow
K Orange
M Orange-red

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