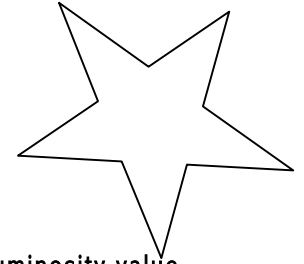
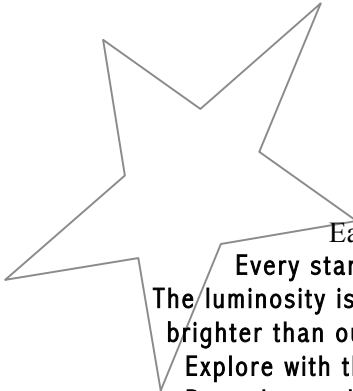


# Star Light, Star Bright

*Exploring How Stars are Classified?? 2pts ec*



## Part 1: Exploring with Classification

Each group will receive 1 set of 25 stars.

Every star indicates the following: a color, name, temperature, size, and luminosity value. The luminosity is compared to the sun's luminosity. If a star has a luminosity value of 5, then it is 5 times brighter than our sun. If a star has a luminosity value of 0.1, then it is 1/10 the brightness of our sun. Explore with the stars – spread them out on your tables and try to find 3 different arrangements. Record your data in spaces below.

### Star Arrangement #1

<b>We arranged our stars according to:</b>	
<b>List some observations about this arrangement below:</b>	
1.	
2.	
3.	

### Star Arrangement #2

<b>We arranged our stars according to:</b>	
<b>List some observations about this arrangement below:</b>	
1.	
2.	
3.	

### Star Arrangement #3

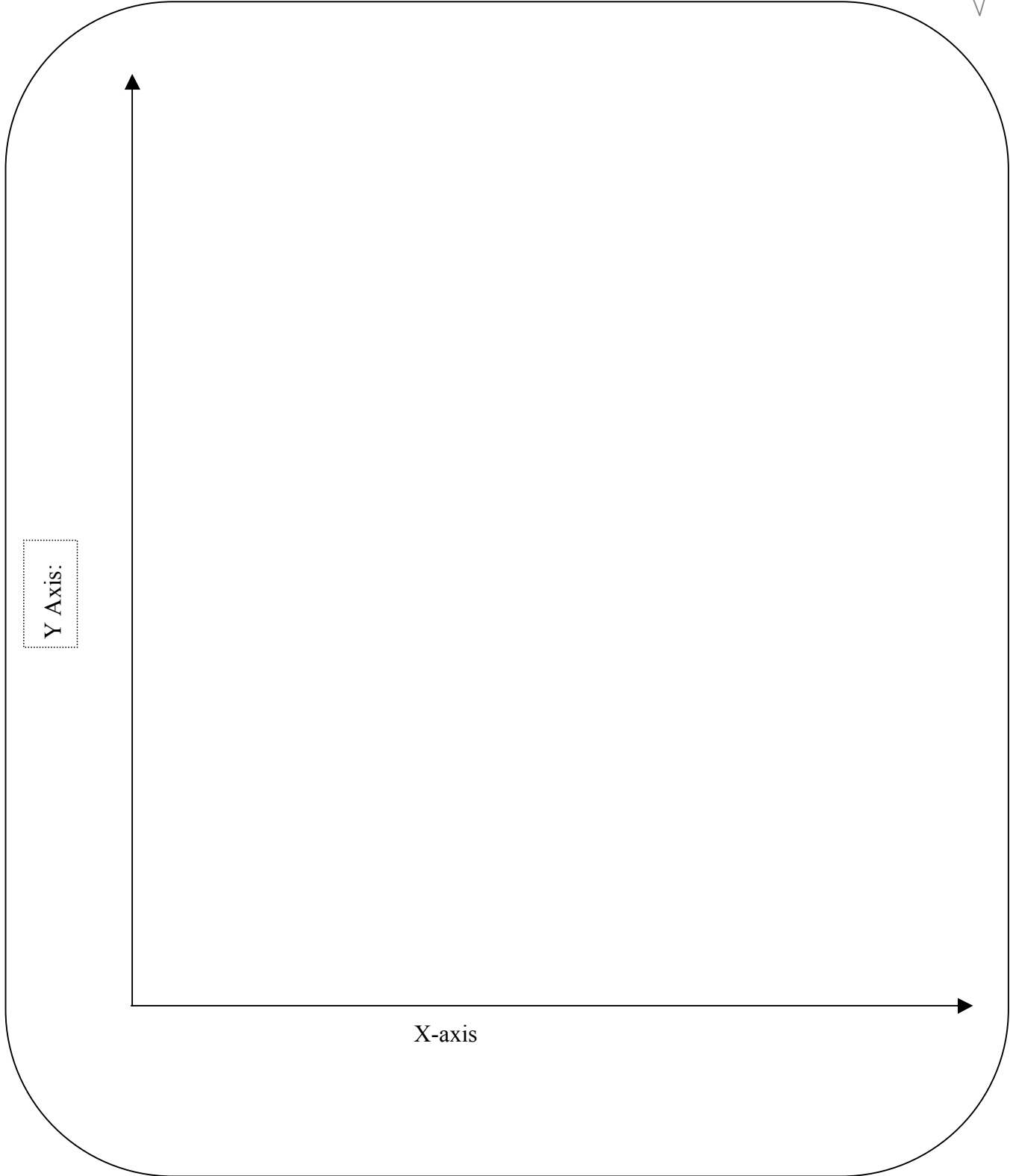
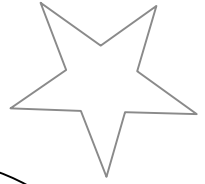
<b>We arranged our stars according to:</b>	
<b>List some observations about this arrangement below:</b>	
1.	
2.	
3.	

Complete the table below. You may need to use a text book. The first row is completed for you!

Name of Special Star	Size	Temperature	Luminosity	Example
<i>Blue Giant</i>	<i>Massive</i>	<i>Really Hot</i>	<i>Really Bright</i>	<i>Naos</i>
Red Giant				
	Small	Hot	Dim	
Supergiant				
Blue Dwarf				
Red Dwarf				

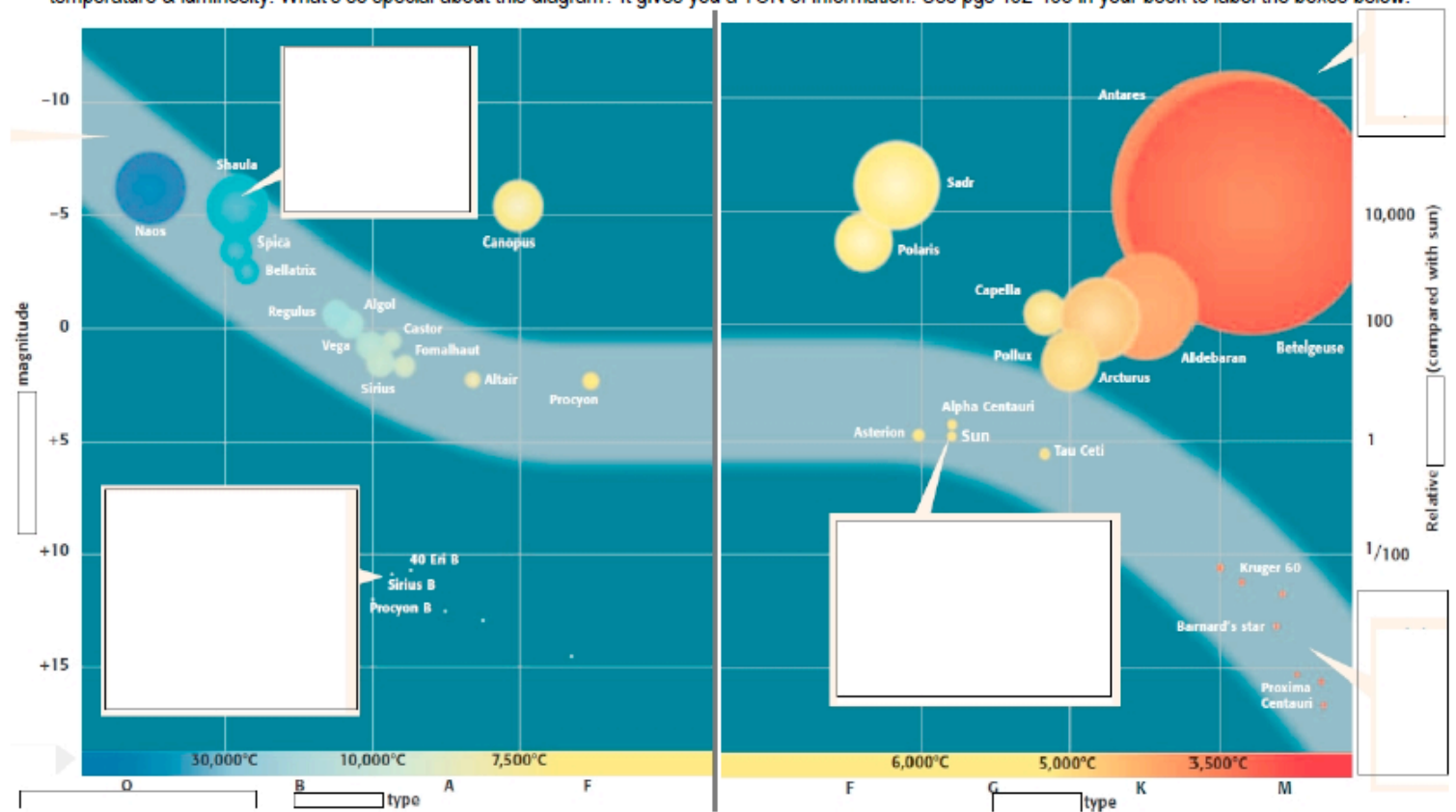
## Part 2: Classification Challenge

- Is there a master way to organize the stars using ALL of this information?
- Using the drawing below, try to plot all of your stars. You choose the Y- and X- axis.
- Draw what you came up with in as organization in the box below. Draw circles & dots to represent the stars.



## THE HR DIAGRAM

In the early 1900s the Danish astronomer E Hertzsprung & American astronomer H Russell developed an important tool for studying stars. They made a graph that graphs temperature on the x-axis and luminosity on the y-axis. This graph is called the Hertzsprung-Russell, or H-R Diagram. Each dot represents a star with a given temperature & luminosity. What's so special about this diagram? It gives you a TON of information! Use pgs 492-493 in your book to label the boxes below.



List 6 pieces of information this graph tells you about a star:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

### Analysis & Conclusion:

1. What can we say about medium sized stars? \_\_\_\_\_
2. What can we say about large stars? \_\_\_\_\_
3. Name a star that is cool and dim: \_\_\_\_\_ temperature? \_\_\_\_\_ luminosity? \_\_\_\_\_
4. Name a star that is cool and bright: \_\_\_\_\_ temperature? \_\_\_\_\_ luminosity? \_\_\_\_\_
5. Name a star that is hot and dim: \_\_\_\_\_ temperature? \_\_\_\_\_ luminosity? \_\_\_\_\_
6. Name a star that is hot and bright: \_\_\_\_\_ temperature? \_\_\_\_\_ luminosity? \_\_\_\_\_
7. What do you think color tells us about temperature? \_\_\_\_\_
8. What do you think temperature tells us about luminosity? \_\_\_\_\_
9. What do you think size tells us about luminosity? \_\_\_\_\_
10. Look at the H-R Diagram in your book on pages 492-493. How does it organize the stars? \_\_\_\_\_

11 :What is known about stars that are placed on the left side of the H-R Diagram?

12 :What is known about stars that are placed toward the top of the H-R Diagram?

13 :What is known about stars that are placed toward the bottom of the H-R Diagram?

14 :How does the chemical content of a star affect its position on the H-R Diagram?

15 :How does the brightness of a star affect its position on the H-R Diagram?

Conclusions: Write 5-7 sentences about what you learned & how this experiment helped you to understand the HR Diagram.

### STAR CLASSIFICATION TABLE

Name	Color	Temperature	Size	Luminosity
Regulus	Blue	20,000	Medium	100
Spica	Blue	30,000	Medium	10,000
Algol	Blue	20,000	Medium	100
Altair	White	9,000	Medium	90
Vega	White	10,000	Medium	100
Achemar	White	10,000	Medium	200
Mizar	White	9,000	Medium	100
Alcor	White	15,000	Medium	10
Sirius	White	15,000	Medium	10
V. Moanen	White	7,000	Small	.0001
Procyon B	White	7,000	Small	.001
Sirius B	White	10,000	Small	.001
Eridani	Yellow	5,000	Medium	1
Polaris	Yellow	6,000	Large	2,000
Procyon	Yellow	6,500	Medium	10
Tau Ceti	Yellow	6,000	Medium	1
Our Sun	Yellow	6,500	Medium	1
Alpha Centauri A	Yellow	6,000	Medium	1
Alpha Centauri B	Orange	5,000	Medium	1
Epsilon	Orange	5,000	Medium	.1
Aldebaran	Orange	5,000	Large	100
Barnard's Star	Red	3,000	Medium	.001
Betelgeuse	Red	3,000	Large	20,000
Antares	Red	3,000	Large	10,000
Mira	Red	3,000	Large	100

Spectral Class	Surface Temp (K)	Color	Examples
O	>30,000	Violet - Blue	Nanos 42,400 Mintaka 35,000
B	10,000 - 30,000	Blue	Spica A 22,400 Rigel 11,000
A	7,500 - 10,000	White	Vega 10,000 Sirius A 9,900
F	6,000 - 7,500	Yellow-White	Canopus 7,500 Procyon A 6,600
G	5,000 - 6,000	Yellow	Sun 5,800 Nihal 5,300
K	3,500 - 5,000	Orange	Arcturus 4,300 Albederan 4,100
M	<3,500	Red	Antares 3,500 Betelgeuse 3,400 Barnard's Star 3,100 Proxima Centauri 3,000 Mira 2,900