

Regents Earth Science

HR Diagram Lab

Name: _____

Lab Day: _____ Lab Period: _____


Lab Instructor: _____

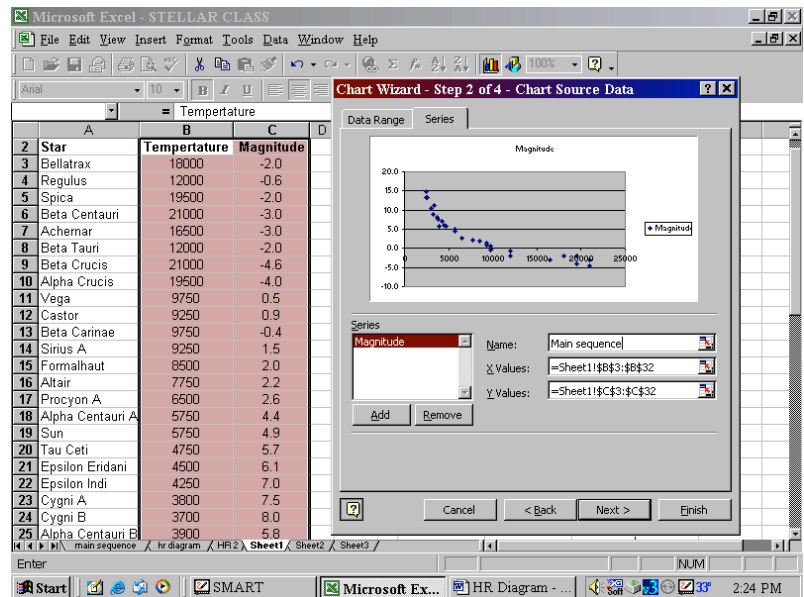
Today you will be making the Hertsprung- Russel Diagram using Microsoft Excel. This allows astronomers to classify stars into groups. The two axis for this graph will be temperature and Magnitude.

You will need to log on to a computer. Once you've done this open the student share drive. Find the earth science folder and the lab folder inside that. Open the excel file called Stars. You will now fill in the empty cells according to the list that follows.

Main sequence stars			Giant stars		
Star	Tempertature	Magnitude	Star	Tempertature	Magnitude
Bellatrix	18000	-2.0	Capella	6000	-0.6
Regulus	12000	-0.6	Pollux	4650	0.8
Spica	19500	-2.0	Arcturus	4500	-0.3
Beta Centauri	21000	-3.0	Aldebaran	3900	-0.2
Achernar	16500	-3.0			
Beta Tauri	12000	-2.0			
Beta Crucis	21000	-4.6	Super Giant		
Alpha Crucis	19500	-4.0	Star	Tempertature	Magnitude
Vega	9750	0.5	Rigel	12250	-6.8
Castor	9250	0.9	Deneb	9000	-6.9
Beta Carinae	9750	-0.4	Canopus	7100	-3.1
Sirius A	9250	1.5	Antares	3300	-4.5
Formalhaut	8500	2.0	Betelgeuse	3200	-5.5
Altair	7750	2.2			
Procyon A	6500	2.6	White Dwarfs		
Alpha Centauri A	5750	4.4	Star	Tempertature	Magnitude
Sun	5750	4.9	Sirius B	8100	11.4
Tau Ceti	4750	5.7	Procyon B	6500	13.1
Epsilon Eridani	4500	6.1			
Epsilon Indi	4250	7.0			
Cygni A	3800	7.5			
Cygni B	3700	8.0			
Alpha Centauri B	3900	5.8			
Kapteyn's Star	3400	11.2			
Lacaille 8760	3200	8.8			
Lacaille 21185	3000	10.5			
Bernard's Star	2600	13.2			
Ross 614A	2500	13.3			
Kruger 60B	2500	13.4			
Ross 248	2500	14.7			

Once this has been accomplished. You can begin constructing the HR Diagram. Follow these steps and you should be okay.

1. Highlight the temperature and magnitude columns for just the main sequence stars.
2. Click on the chart wizard icon  in the menu bar
 - a. Select XY scatter and click next
3. Click on the Series tab on the top of the next window
 - a. Name this series "Main Sequence"
4. Now add a series
 - a. Name it "Giant Stars"
 - b. Define the x values by clicking on the little red white and blue box.
 - i. Now highlight the **temperatures only** on the original sheet under the giant star category.
 - c. Define the y values by clicking on the little red white and blue box.
 - i. Now highlight the **magnitude only** on the original sheet under the giant star category.
5. Add another series
 - a. Name it "Super Giant Stars"
 - b. Define the x values by clicking on the little red white and blue box.
 - i. Now highlight the temperatures on the original sheet under the super giant star category.
 - c. Define the y values by clicking on the little red white and blue box.
 - i. Now highlight the magnitude on the original sheet under the super giant star category.
6. Add another series
 - a. Name it "Dwarfs"
 - b. Define the x values by clicking on the little red white and blue box.
 - i. Now highlight the temperatures on the original sheet under the dwarf star category.
 - c. Define the y values by clicking on the little red white and blue box.
 - i. Now highlight the magnitude on the original sheet under the super dwarf category.
7. Click next
 - a. Fill in all appropriate boxes
8. Save as a new sheet



Editing the graph.

1. right click in the gray background.
 - a. Format plot area
 - i. Fill effects
 1. 2 color
 2. vertical shading style
 3. Color 1 – blue
 4. Color 2 – red
 5. Pick upper right variant
2. right click on the x axis – format x axis
 - a. go to the scale tab
 - i. check “values in reverse” order box
 - ii. min value 0
 - iii. minimum value 22000
 - iv. major units every 5000
 - v. minor every 1000
3. right click on the y axis
 - a. go to the scale tab
 - i. check the reverse order box
 - ii. check the x crosses at max box
 - iii. min value = -5

Print your data & graph. Staple this on to your report.

Questions:

1. What is the relationship between temperature and magnitude for stars on the main sequence?
2. What would be the magnitude of a star with a temperature of 25,000 located on the main sequence?
3. How can we tell that red giant stars are very large stars, from just their position in the HR diagram?
4. What event would prompt a star to leave the main sequence?
5. What causes stars to display different colors?