

# Lab #2 Temperature and Color of Stars

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## This Project

Each student will create a colorful chart that displays the relationship between the color and temperature of stars.

## Materials

None

## Before the Computer

- Explain to your class that astronomers have determined seven basic star colors and their associated temperatures. This information is often displayed in the form of an H-R or Hertzsprung-Russell diagram, which displays star color, temperature, and magnitude. This information helps astronomers to determine the stage of life that a star is in, along with its approximate age.
- Astronomers use degrees Kelvin to measure star temperature. The freezing point of water equals 273 degrees Kelvin.

## A. Create a Spreadsheet

1. Open a new workbook document in *Excel*.
2. Click in cell A1. Type the label (*Star Color*). Change the style of this label to **Bold**. To do this, highlight the cell and click on the **Bold** button (**B**) on the toolbar. Press the **Enter** or **Return** key on your keyboard to move to the cell below.
3. In cell A2 type the word (*Red*). Continue to fill in the rest of column A with the following star colors: (*Orange*), (*Light Orange*), (*Yellow*), (*Yellow Green*), (*White*), and (*Blue*).
4. Click in cell A2. Go to the **FORMAT** menu. Select **Cells**, and click on the **Font** tab.
5. Click on the small arrow located on the right side of the **Color** box and select a red color.
6. Click the **OK** button. The font of the (*red*) label should now be red in color.
7. Change the color for each of the remaining six star colors in column A; however, keep the (*white*) label in black so it can be seen.
8. Center all of the data in the cells of column A. To do this, highlight the cells in column A and click on the **Center** button on the toolbar.

## Lab 2 (cont.)

9. Adjust the column width so your labels are all readable. This is done by moving your cursor up to the line separating columns A and B. The cursor will change to a line with two arrows pointing outwards. **+** Click and hold your mouse button down as you drag the line until all of the text shows.
10. Click in cell B1. Type the label (*Temperature [degrees K]*).
11. Change the style of this label to Bold. Press the **Return** or **Enter** key to move you to cell B2. Adjust the column width in order for the label to fit.
12. Enter the specific temperature for each star color in degrees Kelvin. The data for each star can be found in the following table.

Star	Temperature (degrees K)
Red	3,000
Orange	4,000
Light Orange	6,000
Yellow	7,000
Yellow Green	10,000
White	20,000
Blue	30,000

13. Once you have completed filling in the temperature for each star, center all of the data in column B.

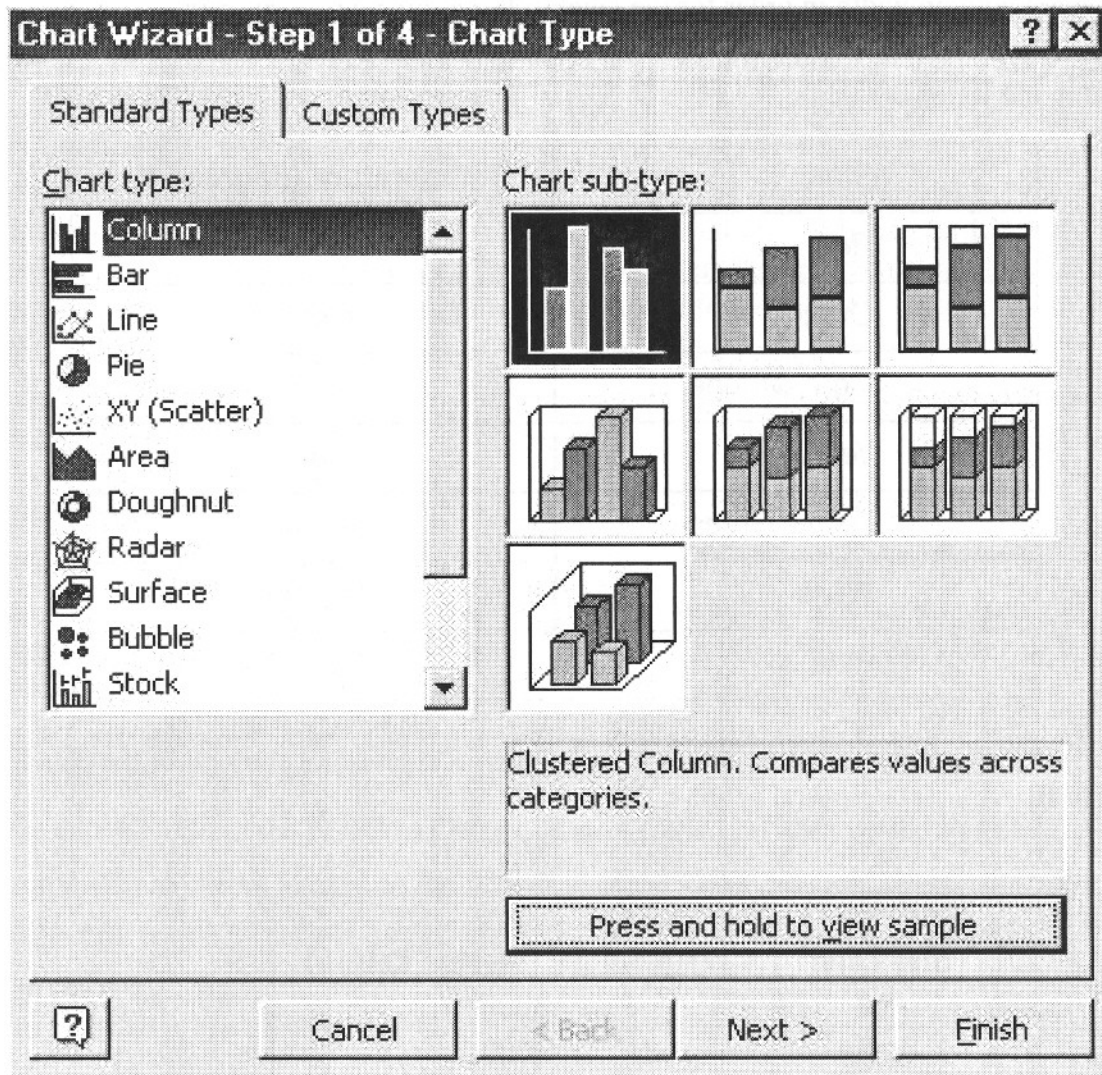
	A	B
1	Star Color	Temperature (degrees Kelvin)
2	Red	3000
3	Orange	4000
4	Light Orange	6000
5	Yellow	7000
6	Yellow Green	10000
7	White	20000
8	Blue	30000

14. Save your data at this point and continue with part B.

## Lab 2 (cont.)

### B. Create a Cluster Column Chart

1. Highlight cells A2-B8. Do not include the Star Color and Temperature labels.
2. Go to the **INSERT** menu, and drag your mouse down to select **Chart**. You can also click on the chart wizard icon, which resembles a colorful bar graph, located on the upper right of the toolbar.
3. Select a **Column Chart** from the chart type list.



4. Click on the **Clustered Column**, and then click the **Next** button two times.

## Lab 2 (cont.)

5. Click in the **Chart Title** box. Type (*Color and Temperature of Stars*).
6. Press the **Tab** key to go to the x-axis category label box. Type (*Star Color*).
7. Press the **Tab** key once again to bring you to the y-axis category label box. Type (*Temperature [degrees K]*). Click the **Next** button.

**Chart Wizard - Step 3 of 4 - Chart Options** [?] [X]

Titles | Axes | Gridlines | Legend | Data Labels | Data Table

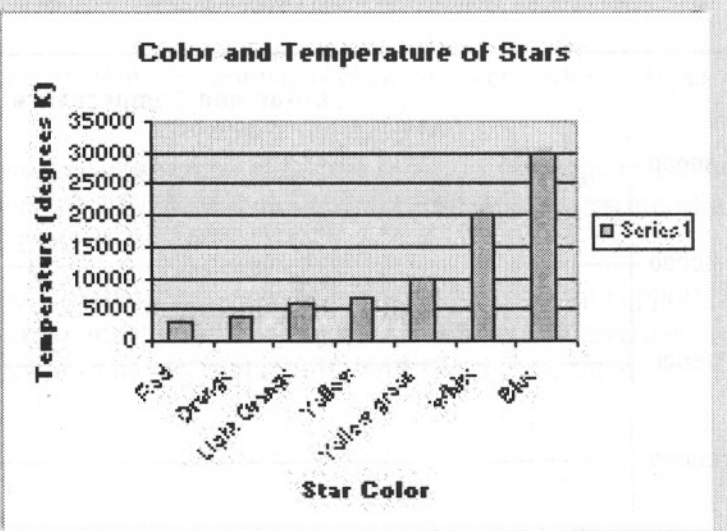
Chart title:

Category (X) axis:

Value (Y) axis:

Second category (X) axis:

Second value (Y) axis:



Temperature (degrees K)

Star Color

Series1

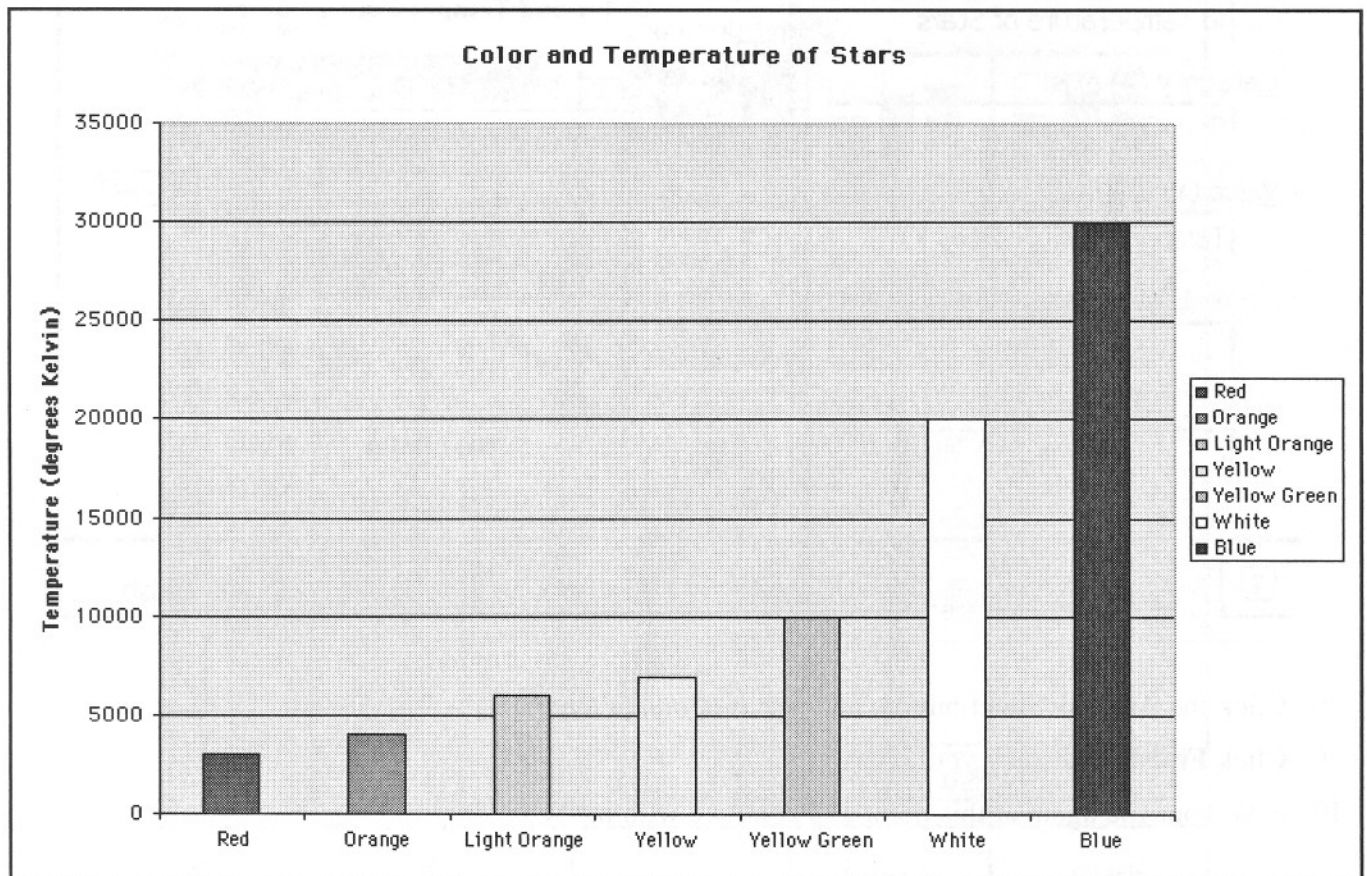
[?] [Cancel] < Back Next > [Finish]

8. Click the **As New Sheet** button, and title it (*Column Chart*).
9. Click **Finish** to display your chart.
10. Save your file again at this point and continue with part C.

## Lab 2 (cont.)

### C. Format the Data

1. Slowly click twice on the column that represents blue stars. You can tell if the column has been selected if it is showing its anchor points.
2. Double click only on the blue star column in your chart.
3. Click on the **Patterns** tab.
4. Select a blue color from the box under the “area” section. Click the **OK** button. The blue star column should now be dark blue. Repeat this procedure to change the color of each column in your chart to match the star color it represents.



This completes the activity.

Remember to save your file.