

### 3.4 Analyzing Using a Spreadsheet

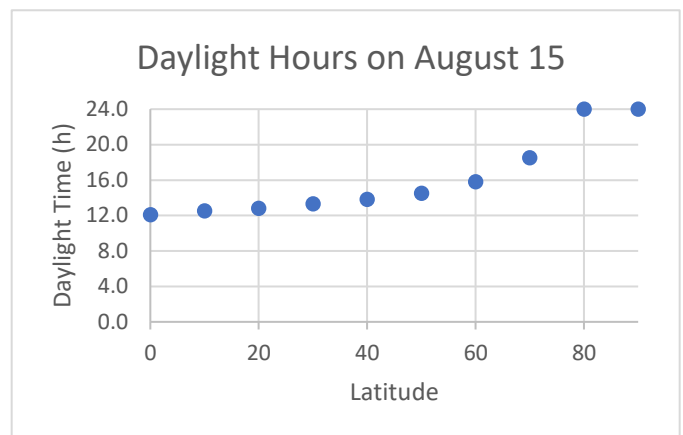
For this activity, we will be using Microsoft Excel or Google Sheets. You will also need to access the class website (link was sent to your gapps account). Make sure to **follow all instructions carefully**.

#### ACTIVITY I

- Go to Google classroom
- Locate and download the file: **Lesson 3.4.xls**
- Open the file. You may wish to save this on your drive.
- Locate the sheet **Daylight Hours**. This spreadsheet shows the latitudes of different locations and the number of daylight hours on August 15

**Question 1:** From the data, describe the relationship between latitude and hours of daylight.

- Highlight cells A3 to B12
- Insert a **Scatter Plot** from the **Insert Ribbon** – choose the first graph with no lines
- Right-click on the Series1 legend and select Delete
- Select the Chart title and Axes titles icons from the **Layout Ribbon** to enter titles and labels as shown
- Right-click on the horizontal axis and select Format Axis
- Change the **Minimum** and **Maximum** options to a **Fixed** setting of 0 and 90, respectively
- Right-click on the vertical axis and select Format Axis
- Change the **Minimum** and **Maximum** options to a **Fixed** setting of 0 and 24, respectively and change the **Major Unit** to a **Fixed** setting of 4



**Question 2:** From the scatter plot, describe the correlation between the variables. Compare this with your description from question 1.

**Question 3:** Do you think a linear model would represent this data well? Explain your thinking.

- Right-click on the (+) icon on the right of the graph and select **Add Trendline**
- Select the Linear Trend/Regression Type
- Select the Display Equation and Display R-Squared value checkboxes

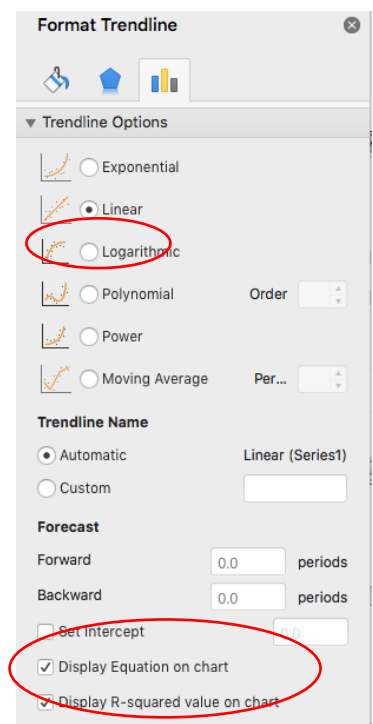
\* The  $R^2$  value ranges from 0-1 and tells us how well the data fits the model/trendline. In general, the higher the  $R^2$  value, the better the fit, however, this is not true for all cases.

**Question 4:** What is the equation of the line of best fit?

**Question 5:** Do you think the line does a good job of representing this data? Would the linear model provide reliable estimates of daylight hours? Justify your answer.

- Go to B13. Type in: `=average(B3:B12)`
- Go to B14. Type in: `=median(B3:B12)`

**Question 6:** Record the mean (average) and median of the data set.



**ACTIVITY I: Response**

**Question 1:** From the data, describe the relationship between latitude and hours of daylight.

**Question 2:** From the scatter plot, describe the correlation between the variables. Compare it with your description of the relationship from question 1.

**Question 3:** Do you think a linear model would represent the data well? Explain your thinking.

**Question 4:** What is the equation of the line of best fit?

**Question 5:** Do you think the line does a good job of representing these data? Would the linear model provide reliable estimates of daylight hours? Justify your answer.

**Question 6:** Record the mean (average) and median of the data set.

**ACTIVITY II**

- Go to Google classroom
- Locate and download the file: **Lesson3.4.xls**
- Open the file. You may wish to save this on your drive.
- Locate the sheet **Snow Rain**. The spreadsheet shows the “weather normals” from Environment Canada, that represent typical weather data for different locations. The current “normals” are based on data collected from 1971 to 2000.

**Question 1:** Do the two variables appear to be related? If so, describe the relationship. If not, explain why not.

- Create a scatter plot for the data. In Excel, the independent variable always defaults to the first column

**Question 2:** Describe any correlation you see. Does the graph support your answer to question 1?

- Add a line of best fit to the graph

**Question 3:** How well do you think the line of best fit represents the data? Justify your answer.

## MAP4C1 Unit 3: Two-Variable Data

**Question 4:** Petawawa receives an average of 228.5 cm of snow each year. Based on the line of best fit, what would you expect the average annual rainfall to be in Petawawa? How close was the prediction to the actual average of 615.9 mm?

### ACTIVITY II: Response

**Question 1:** Do the two variables appear to be related? If so, describe the relationship. If not, explain why not.

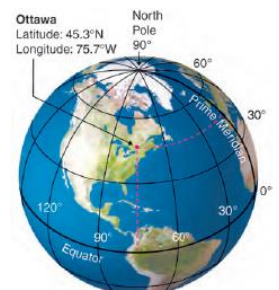
**Question 2:** Describe any correlation you see. Does the graph support your answer to question 1?

**Question 3:** How well do you think the line of best fit represents the data? Justify your answer.

**Question 4:** Petawawa receives an average of 228.5 cm of snow each year. Based on the line of best fit, what would you expect the average annual rainfall to be in Petawawa? How close was the prediction to the actual average of 615.9 mm?

### ACTIVITY III

- Go to Google classroom
- Locate and download the file: **Lesson 3.4.xls**
- Open the file. You may wish to save this on your drive.
- Locate the sheet **Jan Temp**. Latitude and longitude describe the location of places on earth. Latitude describes the location in degrees north or south of the Equator. Longitude describes the location in degrees east or west of the Prime Meridian.



**Question 1:** Looking at the data, predict/explain whether there is a relationship between the mean January temperature of a North American city and the city's Latitude position north of the Equator.

- Create a scatter plot for January temperature and latitude.

**Question 2:** Describe the correlation.

- Insert a trendline for the scatter plot and determine its equation and R-squared value.

MAP4C1 Unit 3: Two-Variable Data

**Question 3:** Looking at the data, predict/explain whether there is a relationship between the mean January temperature of a North American city and the city's Longitudinal position.

- Create a scatter plot for January temperature and longitude. To do this, you will have to highlight values from B2 to B51 and then, while holding the Ctrl key, highlight the values from D2 to D51

**Question 4:** Describe the correlation.

- Insert a trendline for the scatter plot and determine its equation and R-squared value.

**Question 5:** Draw a conclusion about the effect of longitude and latitude on temperature.

**ACTIVITY III: Response**

**Question 1:** Looking at the data, predict/explain whether there is a relationship between the mean January temperature of a North American city and the city's Latitude position north of the Equator.

**Question 2:** Describe the correlation.

**Question 3:** Looking at the data, predict/explain whether there is a relationship between the mean January temperature of a North American city and the city's Longitudinal position.

**Question 4:** Describe the correlation.

**Question 5:** Draw a conclusion about the effect of longitude and latitude on temperature.