

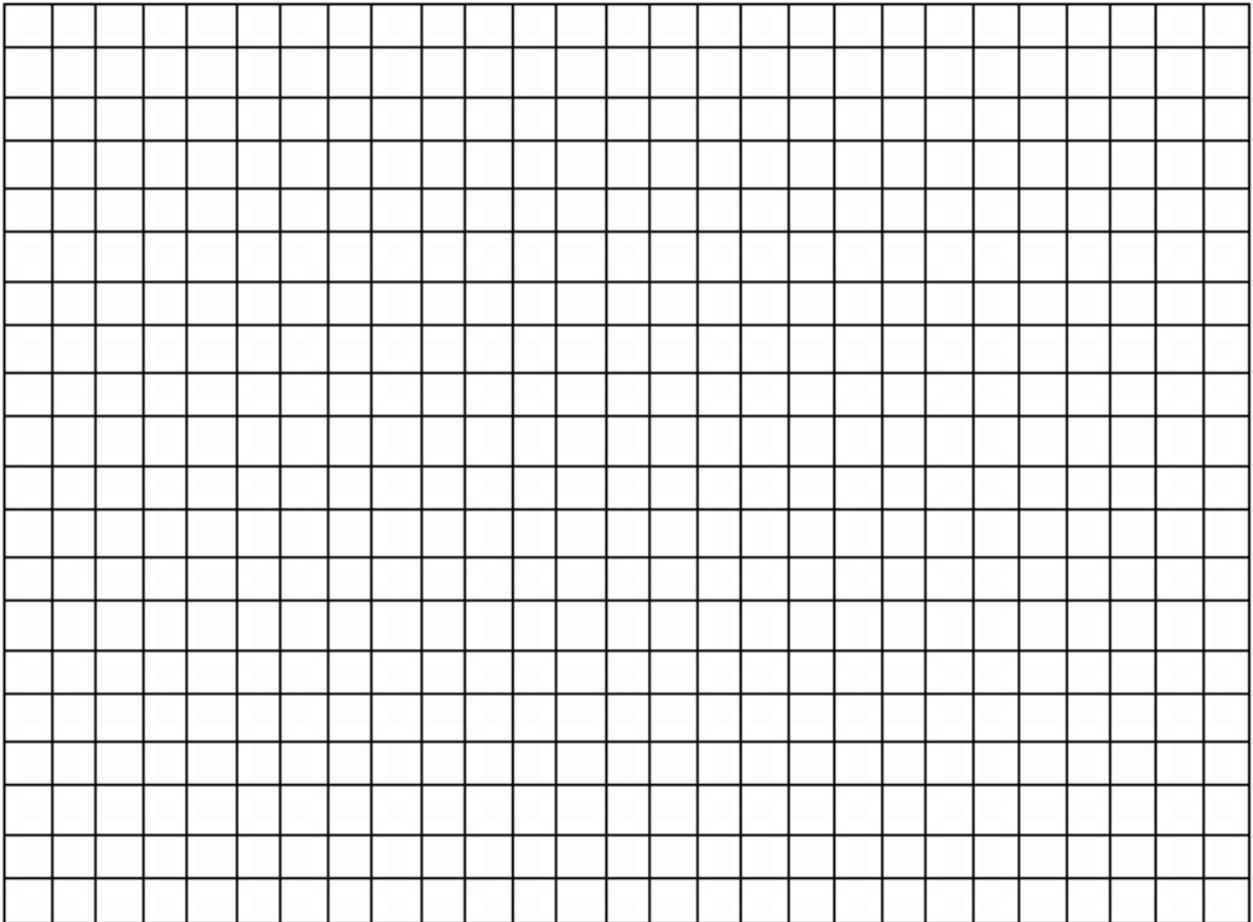


SCIENTIFIC PROCESS: GRAPHING



Graph Requirements:

1. **Include a specific title** (for example, "Relationship between ...").
★ On the blank, write a title for a graph of the data in "*The effect of heating time on temperature of water*" data table.



Time on hot plate (s)	Temperature of Water (°C)				Average temperature of water (°C)
	Trials				
	1	2	3	4	
60	35.0	37.0	36.0	38.0	36.5
120	56.0	54.0	53.0	58.0	55.3
180	77.0	76.0	78.0	76.0	76.8
240	94.0	98.0	95.0	96.0	95.8

2. Graph should be $\frac{1}{2}$ **page**, at a minimum
3. Graph axis must be straight, drawn with a ruler
4. Label your axis. The **MV is placed on the X axis** (horizontal line) and the **RV is placed on the Y axis** (vertical line). The unit of measurement is placed in parenthesis next to or beneath the variable.
 - ★ Correctly label the axis on the graph below for the in “*The effect of heating time on temperature of water*” data.

5. Determine the scales for the axes.

- i. First, round the lowest piece of data down and the highest piece of data up for each variable.

- i. **TIME:**

1. lowest data rounds to: _____

2. highest data rounds to: _____

- ii. **AVERAGE TEMPERATURE::**

1. lowest data rounds to: _____

2. highest data rounds to: _____

- ii. Then, determine the range of these numbers, by subtracting the lowest number from the highest number.

- i. **Time range:** _____

- ii. **Average Temperature range:** _____

- iii. Divide the range by the number of boxes on each axis. This final value equals the increment each box represents. You may round up to an appropriate number.

- i. **Number of boxes on X axis:** _____ **Increment:** _____

- ii. **Number of boxes on Y axis:** _____ **Increment:** _____

★ Label the axis on the graph with the increments determined in the previous step.

6. Plot data pairs

★ Plot the data found on “*The effect of heating time on temperature of water*” table

7. Draw a best fit line.

The best-fit-line should have roughly equal numbers of data points above and below the line.

The line must follow the pattern seen in data points

The line does NOT have to start at the origin (0,0)

★ Draw a best-fit line, with a ruler, on the graph

8. Calculate the slope of your best fit line. HINT: we are calculating RISE over RUN

- i. First, pick any two points on the best fit line. The points you pick do not have to be actual data points. It is easier if you pick points that are located where two axis grid lines intersect.

- ii. For each point, determine its location along the X and Y axis.

- i. Point 1:

1. Location on X axis (X_1): _____

2. Location on Y axis (Y_1): _____

- ii. Point 2:

1. Location on X axis (X_2): _____

2. Location on Y axis (Y_2): _____

- iii. Plug your numbers into the following equation:

$$\text{Slope} = \frac{Y_2 - Y_1}{X_2 - X_1}$$

- iv. Be sure your slope answer includes units! Your answer CAN BE a negative number!!

Calculate the slope of the graph here. When done, show your teacher to earn a stamp on your graph!