

# Organizing Data: Graphing Assignment

\_\_\_/33

## Why?

J qy 'ku'f cve'f kur rc { gf 'vq'o cmg'k'o gcplpi hwnA

Uelgpvkuu'tgnf "qp" f cve"vq" f guetkdg'pcwtg'cpf "wpeqxtg'tgrv'kpuj kr u0Vj g'tcy "f cveô o gcwtgo gpv'vcngp'kp" vj g'rcdô ctg'o quv'vughwily j gp'vj g {"ctg'qti cpk gf "kp" c'y c {"vj cv'o cmgu'vj g'tgrv'kpuj kr u'ergct0k'vj ku'ce'v'k'k'v' " {qw'y kn'g'zr mtg'y q'eqo o qp'y c {u'vj cv'uelgpvkuu'qti cpk g'f cve"vq"j gr "kp" cpcn' uku0

## Model 1 – Copper Samples

Group Number	Volume (cm <sup>3</sup> )	Mass (g)	Substance
3	"40	"390 4	Eqr r gt
4	"80	"720 ;	Eqr r gt
5	320	"; 5067	Eqr r gt
6	": 0	"9; 052	Eqr r gt
7	360	347066	Eqr r gt
8	"60	"5; 0 2	Eqr r gt
9	340	3250 7	Eqr r gt

Tqqo "Vgo r gtcwtg<430"Æ

30 Y j cv'uwdv'cpeg'y gtg'vj g'uwf gpv'u'y qtnkpi 'y kj "vq"qdv'k'vj g'f cve'kp"O qf gn'3A

/1 mark

40 Y j cv'xctkcdrg'u'f'kf'vj g'uwf gpv'u'o gcwtg'vq'r tqf weg'vj g'f cve'kp"O qf gn'3A

/1 mark

50 Dtlghn' f guetkdg'cp'g'zr g'tko gpv'vj cv'vj g'emuu'o ki j v'j cxg'f qpg'qp'vj g'f c {"vj cv'vj g'f cve'kp" O qf gn'3'y cu'eqmgev'f 0"

/1 mark

60 Eqpukf gt'vj g'f cve'kp"O qf gn'30

/3 marks

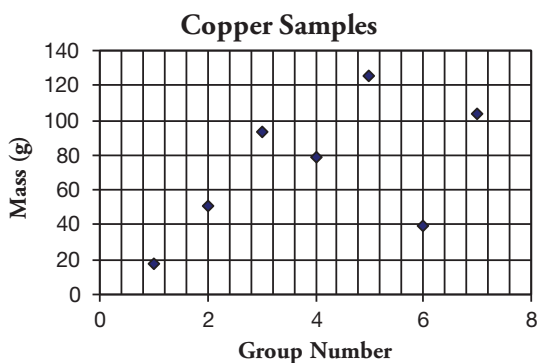
a. Y j lej 'xctkcdrg'y cu'vj g'**independent variable**'kp'vj g'g'zr g'tko gpv'cpf 'y j {"f q" {q w" vj kpnk'y cu'vj g'lpf gr gpf gpv'xctkcdrgA"

b. Y j lej 'xctkcdrg'y cu'vj g'**dependent variable**'kp'vj g'g'zr g'tko gpv'cpf 'y j {"f q" {q w'vj kpnk'y cu vj g'f gr gpf gpv'xctkcdrgA"

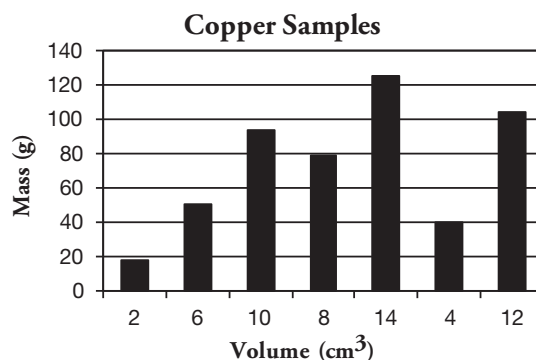
c. Nku'vy q'**controlled variables**'kp'vj g'g'zr g'tko gpvA

## Model 2 – Graphs for Copper Data

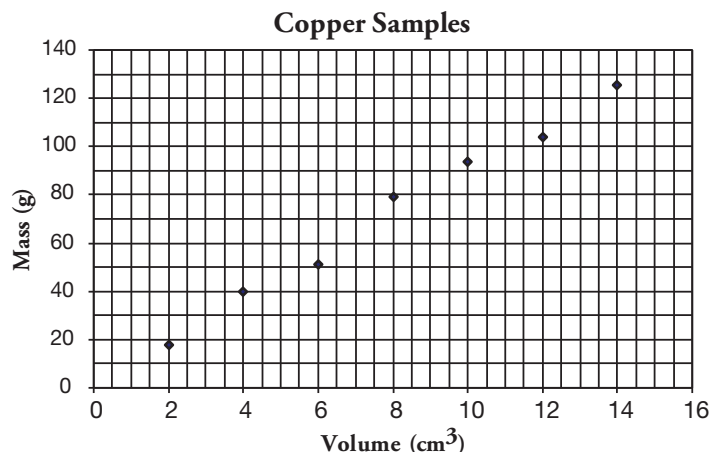
Graph A



Graph B



Graph C



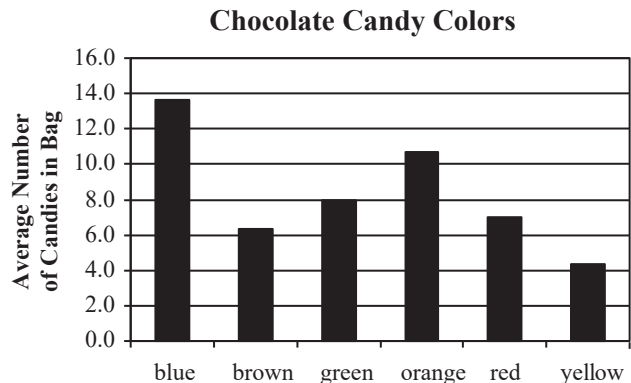
5. Identify each of the graphs in Model 2 as a **bar graph** or a **scatter plot**. /1 mark
6. One of the data points in graph B indicates that a volume of 8 cm<sup>3</sup> has a mass of 80 g. Which other graph in Model 2 shows this same data? /1 mark
7. Of the three graphs in Model 2, which illustrates the relationship between the variables that you stated in Question 2 most clearly? /1 mark

### Read This!

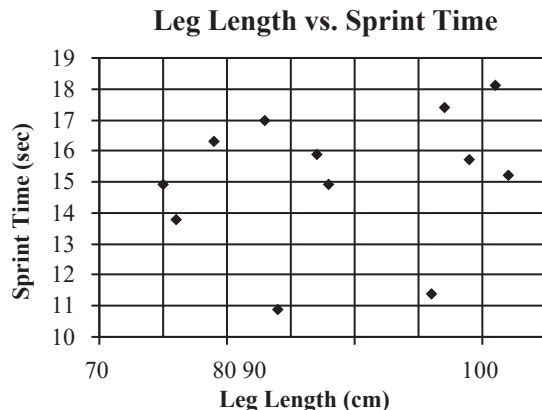
Scientists use graphs to clearly illustrate whether or not there is a relationship between variables. In most cases a scatter plot is used. Bar graphs are sometimes used if the independent variable is limited to specific numeric values (where the values in-between are not possible) or is non-numeric. A special type of bar graph called a histogram is used in cases where the scientist wants to show how often something happens.

### Model 3 – More Examples of Graphs

**Graph D**



**Graph E**



8. Identify the independent variable and dependent variable for each of the graphs in Model 3. /2 marks

	<b>Graph D</b>	<b>Graph E</b>
<b>Independent Variable</b>		
<b>Dependent Variable</b>		

9. Match the experimental questions below to the appropriate graph from Model 3. /2 marks

- a. “Is the number of candies in a bag of chocolates dependent on the color of the candy?” Graph \_\_\_\_\_
- b. “Does the length of a person’s leg affect the time it takes them to sprint 60 yards?” Graph \_\_\_\_\_

10. Why was the data for Graph D plotted in a bar graph? /1 mark

11. Using the graphs in Model 2 and Model 3 as examples of proper graphs, identify the axis (x or y) where you would usually plot the independent variable. /1 mark

12. For each of the following experiments, choose "bar graph" or "scatterplot" as the most appropriate way to display the data. Justify your answer. /4 marks

- a. Students heated oil on a hot plate for different amounts of time. They wanted to answer the question "How long do you need to heat an oil bath to reach a given temperature?"

*Bar Graph or Scatter Plot?*

Volume Oil (mL)	Hot Plate Setting	Initial Temp. of Oil (°C)	Time Heated (min)	Final Temp. of Oil (°C)
250	#4	21	0	21
250	#4	21	5	30
250	#4	21	10	38
250	#4	21	15	47
250	#4	21	20	57

- b. Students measured the height of each student in class. They wanted to answer the question "What is the most common height among 10th grade students?"

Height Range	Number of Students
under 4' 0"	1
4' 1" to 4' 6"	3
4' 7" to 5' 0"	5
5' 1" to 5' 6"	9
5' 7" to 6' 0"	3
over 6' 0"	1

*Bar Graph or Scatter Plot?*

- c. The Fish and Wildlife agency measured the size of Pacific salmon for 1 year and recorded the average weight for each species.

Salmon Species	Average Weight (lbs)
King	15
Sockeye	8
Silver	12
Chum	15
Humpback	5

*Bar Graph or Scatter Plot?*

- d. The National Oceanic and Atmospheric Administration measured the pressure of the atmosphere at various altitudes.

Altitude (m)	Atmos. Pressure (atm)	Altitude (m)	Atmos. Pressure (atm)
0	1.000	16,132	0.100
2750	0.750	30,901	0.010
5486	0.500	48,467	0.001
8376	0.333		

*Bar Graph or Scatter Plot?*

13. Graph the following data. Graph (a) on the first graph paper, and (b) on the second graph paper. **/5 marks**

Make sure to include the following on your graph:

- A descriptive underlined title
- The independent and the dependent variables on the appropriate axes
- An underlined title on the x and y axis (including units in brackets after your title)
- An appropriate scale on the x and y axis that fills the **majority** of the space.  
 Make sure each grid is worth the same value  
 The x and y scales DO NOT have to be the same, and DO NOT have to start at zero.
- Draw a line of best fit. From this line, determine the slope. **Mark the points you are using to find slope.**  
 Show all your work, including units at the side of the graph.  
 Remember: slope = rise run OR slope =  $(y_2 - y_1) / (x_2 - x_1)$

a) A sample of gas was placed within an expandable container and heated. The data is:

Temperature (K)	Volume (mL)
273	152
320	175
365	203
412	226
455	249
521	273
546	302
580	323

b) Plot the mass against volume for each metal on the same graph (use a different colour for each line). **/9 marks**  
 Please include a legend of what metal each colour is representing.

Volume (mL)	Copper (g)	Aluminum (g)	Platinum (g)
2.0	17.4	5.4	42.9
8.0	71.7	21.6	171.6
12.0	107.5	32.4	257.4
15.0	134.4	40.5	321.8
19.0	170.2	51.3	407.6

