Science 9
Graphing

Date: Oct. 4th

Calculating Slope

The LINE of a graph is the graph's slope.
A POSITIVE slope slants upwards to the right.
A NEGATIVE slope slants downwards to the right.
A horizontal line has a slope of ZERO.

Equation for Slope:

To determine the constant (slope):
(i) Pick any two POINTS from a straight line graph.
(ii) Write down the coordinates NUMBERS for each point selected.
(iii) Substitute the coordinates into the equation. Solve for k.

Once you have calculated the slope you can determine the equation for straight line by locating the point where the graph crosses the y axis to find the Y intercept.

'm' = slope

equation : $y = kx + b$ — y-intercept

Practice: Graphing and Calculating Slope

1. A speed record for auto racing was set by Craig Breedlove of Los Angeles at Bonneville Salt Flats in a jet propelled car on November 15, 1965. Timers located along the speedway obtained the following data on one of Breedlove's runs.

km

Distance Car Travelled (miles) (Y)	Time (hours) (X)
0	0
12	~~0.02~~ 1 Hour
30	~~0.05~~ 2.5 Hours
48	~~0.08~~ 4.0 Hours
60	~~0.10~~ 6.0 Hours

a. Graph the data. Include all the components of a complete graph.
b. Determine the constant (slope) for this data. Show your work and answer on the graph. Include the units.
c. Determine the equation for this graph: _____
d. Use the equation to answer the following questions. Show your work and include the units.

(i) How far did the car travel in 0.03 hours? 1.5 _____

(ii) How far did the car travel in 0.07 hours? 3 _____

(iii) How long did it take the car to travel 54 miles? km _____

(iv)How long would it take the car to travel 200 miles? km _____

(v) Convert your answers i - ii above into km. Use the conversion factor method. Show your work. (Note: 1 mile= 1.6 kilometers)

(v) Convert your answers iii - iv above into minutes. Use the conversion factor method. Show your work. (Note: 1 hour = 60 minutes)

2. Top speed attainable by a motor cycle is related to the engine size, provided the weight of the motor cycle remains constant.

Engine Size (cc) (Y)	Top Speed (mph) (X) km/h
0	0
150	50
370	125
445	150
670	225

a. Graph the data. Include all the components of a complete graph.
b. Determine the constant (slope) for this data. Show your work and answer on the graph. Include the units.
c. Determine the equation for this graph: _____

d. Use the equation to answer the following questions. Show your work and include the units.

(i) What size engine would a motorcycle need to reach a top speed of 100 ~~mph~~ km/h? _____

(ii) What size engine would a motorcycle need to reach a top speed of 175 ~~mph~~ km/h? _____

(iii) How fast would you expect the top speed of a motorcycle to be if it had a 275 cc engine?

_____

(iv) How fast would you expect the top speed of a motorcycle to be if it had a 500 cc engine?

_____

Science 9

Name: _____

Date: _____

Metric Conversions Practice 1

1. State the meaning for each of the following symbols:

g: _____ kg: _____ mg: _____

m: _____ cm: _____ km: _____

L: _____ mL: _____ kL: _____

2. State the symbol for each of the following units of measurement:

kilometer: _____ centigram: _____ milliliter: _____

centimeter: _____ kiloliter: _____ milligram: _____

3. Complete the following:

1 kg = _____ grams 100 cm = _____ meters

1000 mm= _____ meters 1 L = _____ millilters

4. Convert the follow metric units using the conversion factor method. Show all work in the space provided.

a. 35 kg to g

b. 1500 mL to L

c. 150 cm to m

d. 12 km to m

e. 2 kL to mL

f. 15 000 000 mm to km