GRAPH WORK

RULES on drawing a graph

1. ***Chose the largest convenient scale for your axes*** – make sure that all your readings will fit on the graph paper before you decide on each scale.

2. ***Label your axes*** – each axis should show what is being measured and the units being used.

3. ***Plot the points with small x's or dots with circles***

4. ***Draw the best line you can through the points this is known as a best fit line***
    Decide whether the line should go through the origin. Sometimes when we plot our points we realize that they do not "line up" to give us the perfect straight line graph. We need to draw a "best fit line". First, we try to balance the ruler so that it passes through as many points as possible, however, we need to make sure that:

    (i)   the same number of points are above the "best fit" line as below the line.

    (ii)   The points not on the line are the same distances from the line.

    [Remember to ALWAYS choose new points which lie on the line to calculate the gradient]

    Then draw the straight line or smooth curve which goes closest to most of the points.

5. ***Do not forget to write the title of the graph***.

6. $$\text{gradient} = \frac{y_1 - y_2}{x_1 - x_2}$$

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Question 1:

A student adds a substance to a measuring cylinder and recorded the mass and the volume as shown in the table below.

Mass / (g)	5	15	25	30	60
Volume / (cm³)	1	3	5	6	12

(a) Plot a graph of mass (y - axis) against volume (x - axis)

Using a scale of: y – axis: 2 cm represents 5 g
x – axis: 1cm represents 1 cm³

(b) Determine the gradient and state the units of the gradient.
(c) What does the gradient represent?

Question 2:

Draw a graph using the information shown in the table below

Mass / (kg)	1	2	5	6	12
Density / (kg/m³)	10	20	50	60	120

(a) Plot a graph of mass (y - axis) against density (x - axis)

Using a scale of: y – axis: 2 cm represents 1 kg
x – axis: 1cm represents 10 kg/m³

(b) Determine the gradient and state the units of the gradient.
(c) What does the gradient represent?

Best fit lines should be drawn for the following practice questions.

Question 3:

Draw a graph using the information shown in the table below

Mass / (g)	5	13	17	21	25	29	40
Volume / (cm³)	0	10	15	20	25	30	40

(a) Plot a graph of mass (y - axis) against volume (x - axis)
Using a scale of: y – axis: 1 cm represents 2 g
x – axis: 2cm represents 5cm³

(b) Determine the gradient and state the units of the gradient.

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Question 4:

The force acting on different masses was recorded as shown below.

Force / (N)	0	5	10	16	20	24
mass / (kg)	0	1	2	3	4	5

(a) Plot a graph of Force (y - axis) against mass (x - axis)

Using a scale of: y – axis: 1 cm represents 1 N
x – axis: 2cm represents 1 kg

(b) Determine the gradient and state the units of the gradient.
(c) If an object made of the same material used in the experiment has a mass of 3.5 kg, what is the force acting on it?

Question 5:

Draw a graph using the information shown in the table below

Mass / (kg)	1	2	5	6	12
Density / (kg/m³)	10	20	50	60	120

(a) Plot a graph of mass (y - axis) against density (x - axis)

Using a scale of: y – axis: 2 cm represents 1 kg
x – axis: 1cm represents 10 kg/m³

(b) Determine the gradient and state the units of the gradient.
(c) What does the gradient represent?