St. Mary's Catholic High School, Muhaisnah

MENTAL MATH

LO: To accurately interpret and draw real life graphs.

TASK

1) Simplify: $7a - 5b - 9a + 8b$

$= -2a + 3b$

2) (a) $\frac{2}{5} + \frac{2}{7}$ (X 7 / X 5)

$= \frac{14}{35} - \frac{10}{35}$

$= \frac{4}{35}$

(b) $\frac{3}{8} \div \frac{4}{6}$

$= \frac{3}{8} \times \frac{6}{4}$

$= \frac{18}{32} = \frac{9}{16}$

3) Fill in the blanks below:

1 gallon ≈ 4.5 litres

1 inch ≈ 2.5 cm

1 mile ≈ 1.6 km

1 kilogram ≈ 2.2 pounds

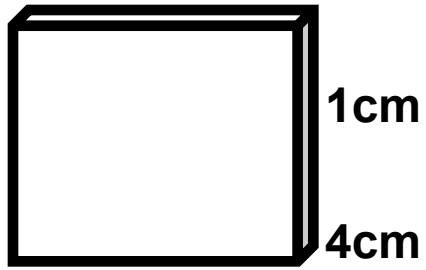
4) Value of $9e - 6$ when $e = 5$

$= 9 \times 5 - 6 = 39$

Replace e with 5

EXTENSION

1) Work out the volume and surface area of the cuboid below:



Volume of a cuboid = l x w x h

Volume of a cuboid = 6 x 4 x 1

Volume of a cuboid = 24cm^3

2) Expand and simplify:

$8(y - 6) - 3$

$= 8y - 48 - 3$

$= 8y - 51$

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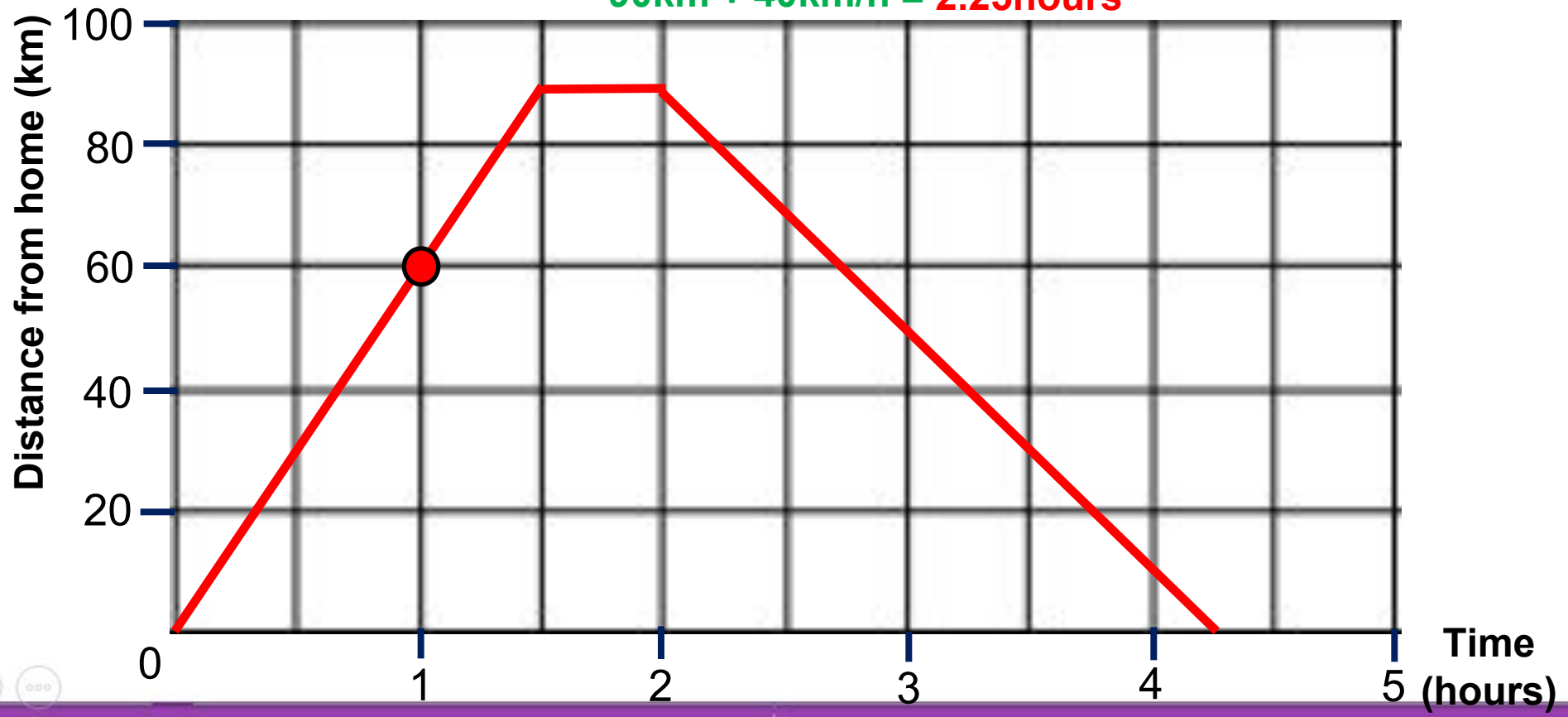
STARTER

LO: To accurately interpret and draw real life graphs.

I set off from home to pick up a dog from the vet. I travelled for 1.5 hours at an average speed of 60km/h. It took me 30 minutes to get the dog settled into my car. I then travelled back home at an average speed of 40km/h as I did not want to jolt the dog. Draw a distance-time graph of the journey.

90km ÷ 40km/h = 2.25hours



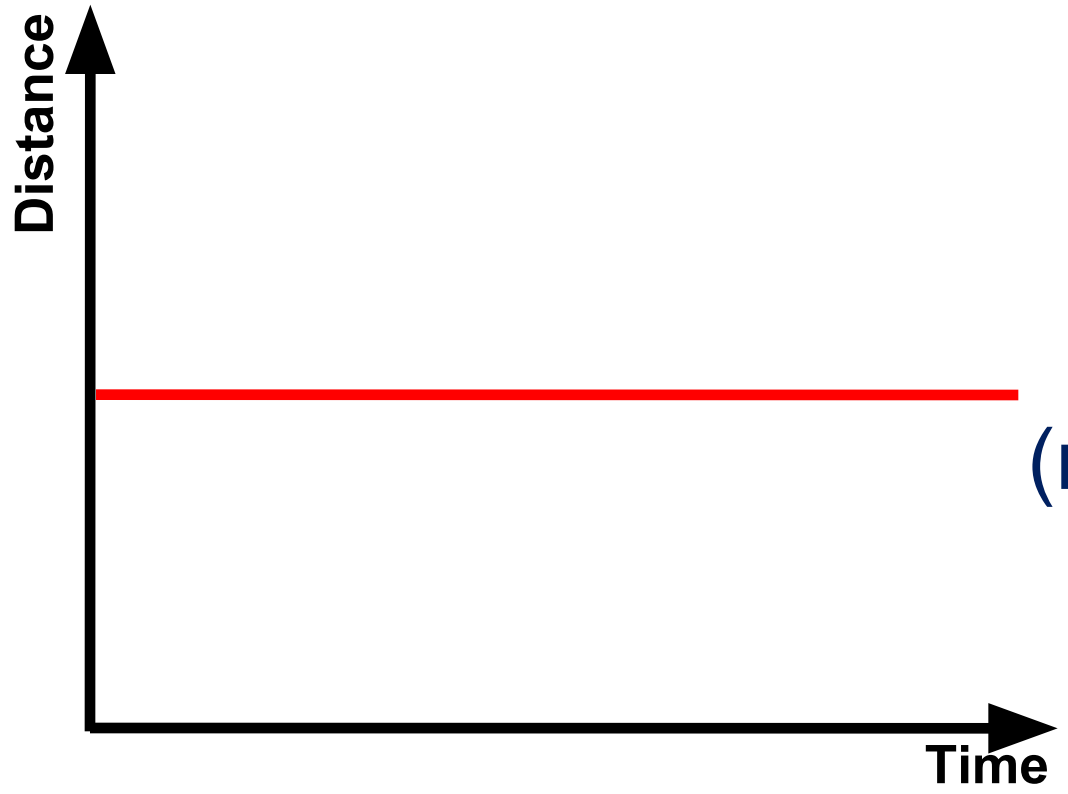
St. Mary's Catholic High School, Muhaisnah

KEY CONCEPT

LO: To accurately interpret and draw real life graphs.

INTRODUCTION

What does this graph show?



Stationary
(not moving)

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KEY CONCEPT

LO: To accurately interpret and draw real life graphs.

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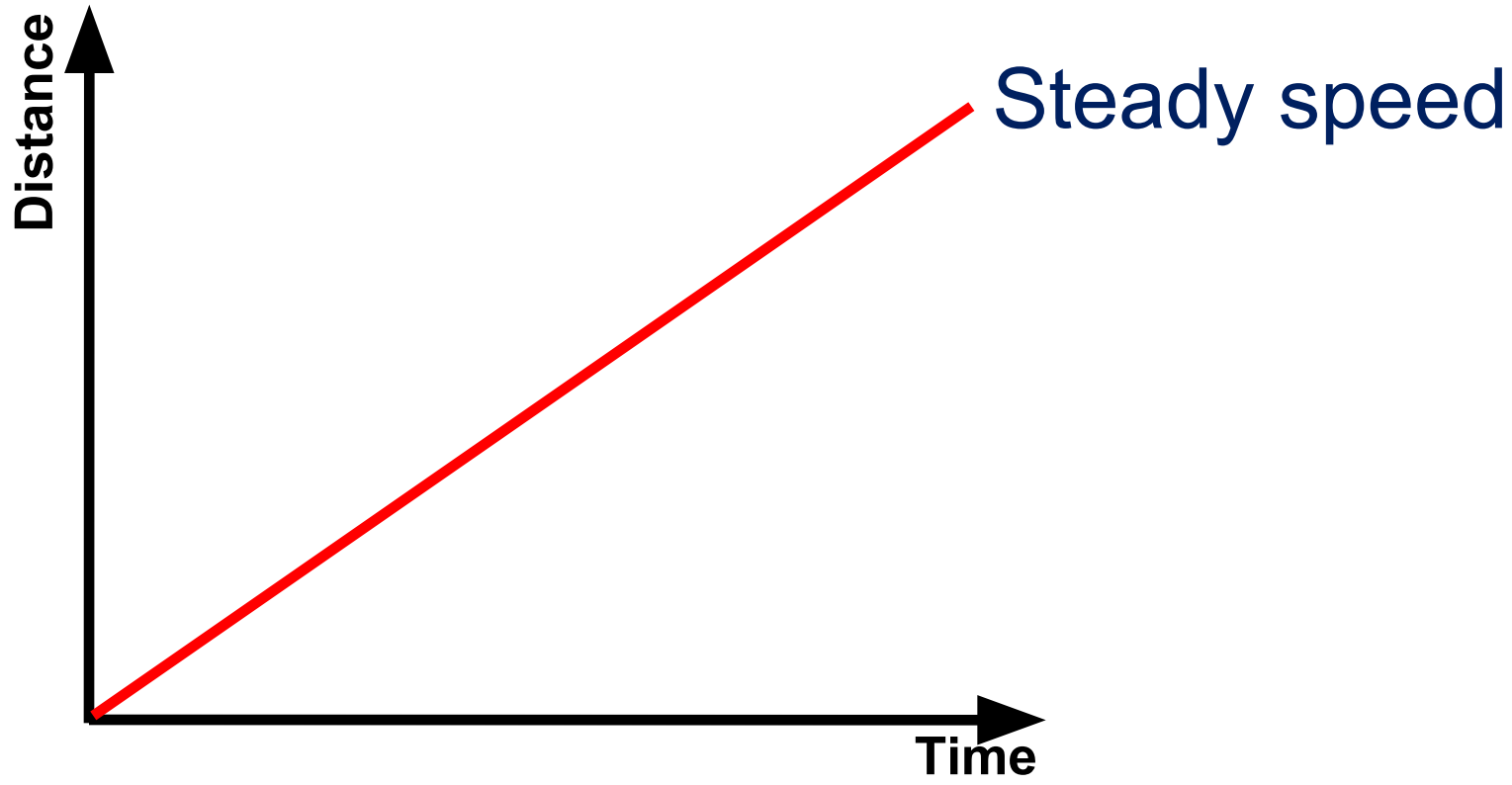

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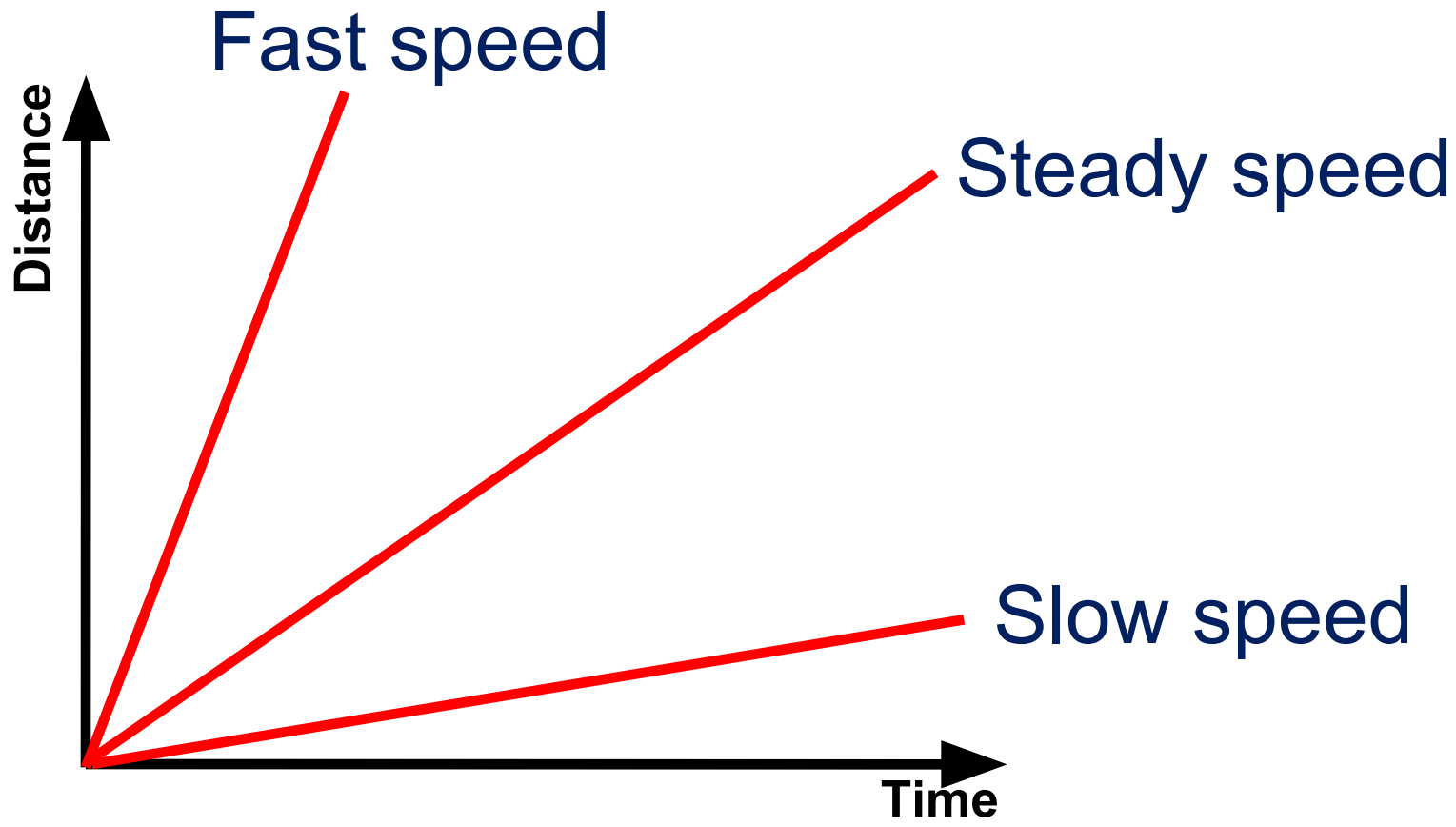
KEY CONCEPT

LO: To accurately interpret and draw real life graphs.

INTRODUCTION

Compare the other two graphs to the first one.



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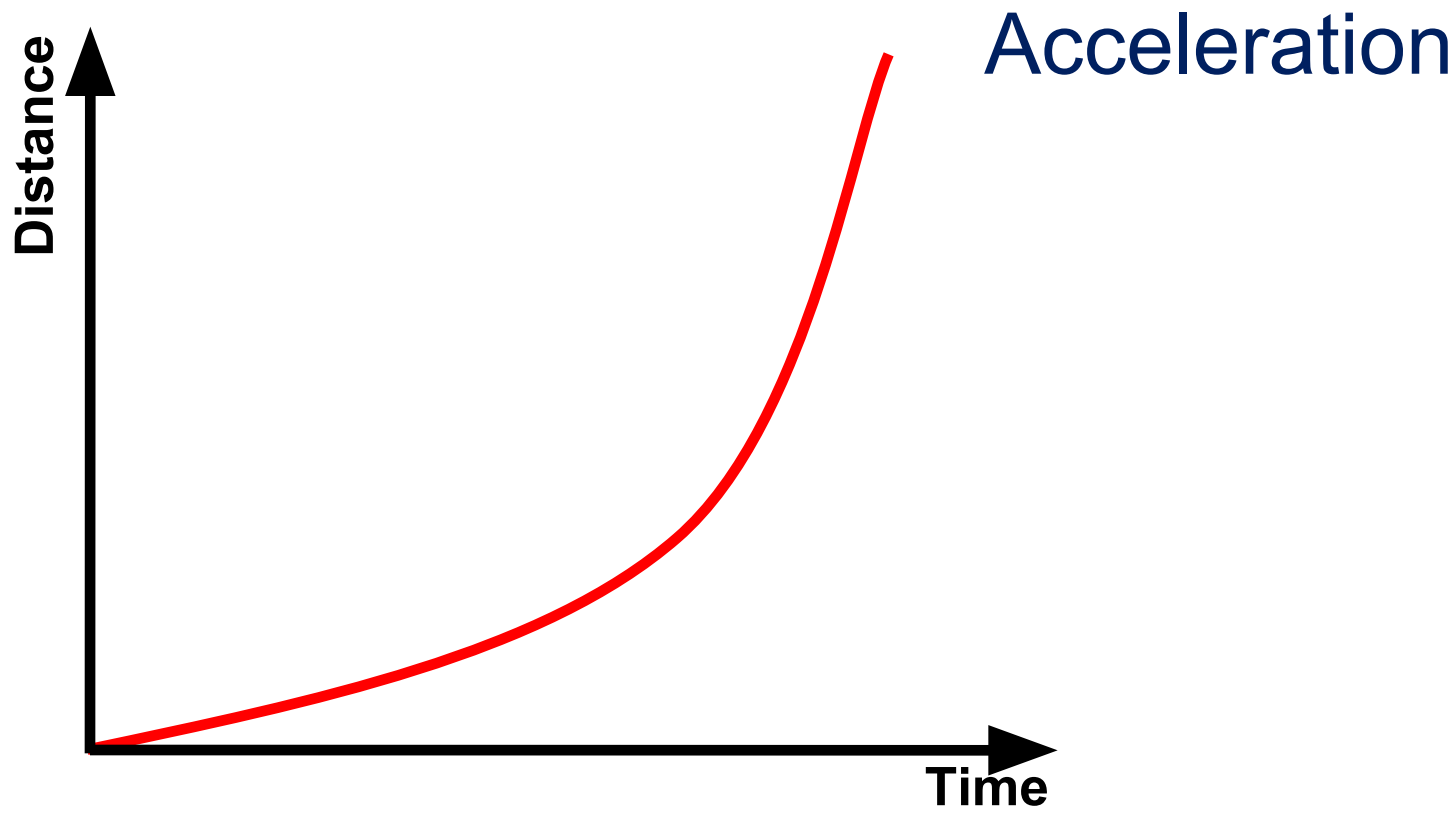
KEY CONCEPT

LO: To accurately interpret and draw real life graphs.

INTRODUCTION

What does this graph show?



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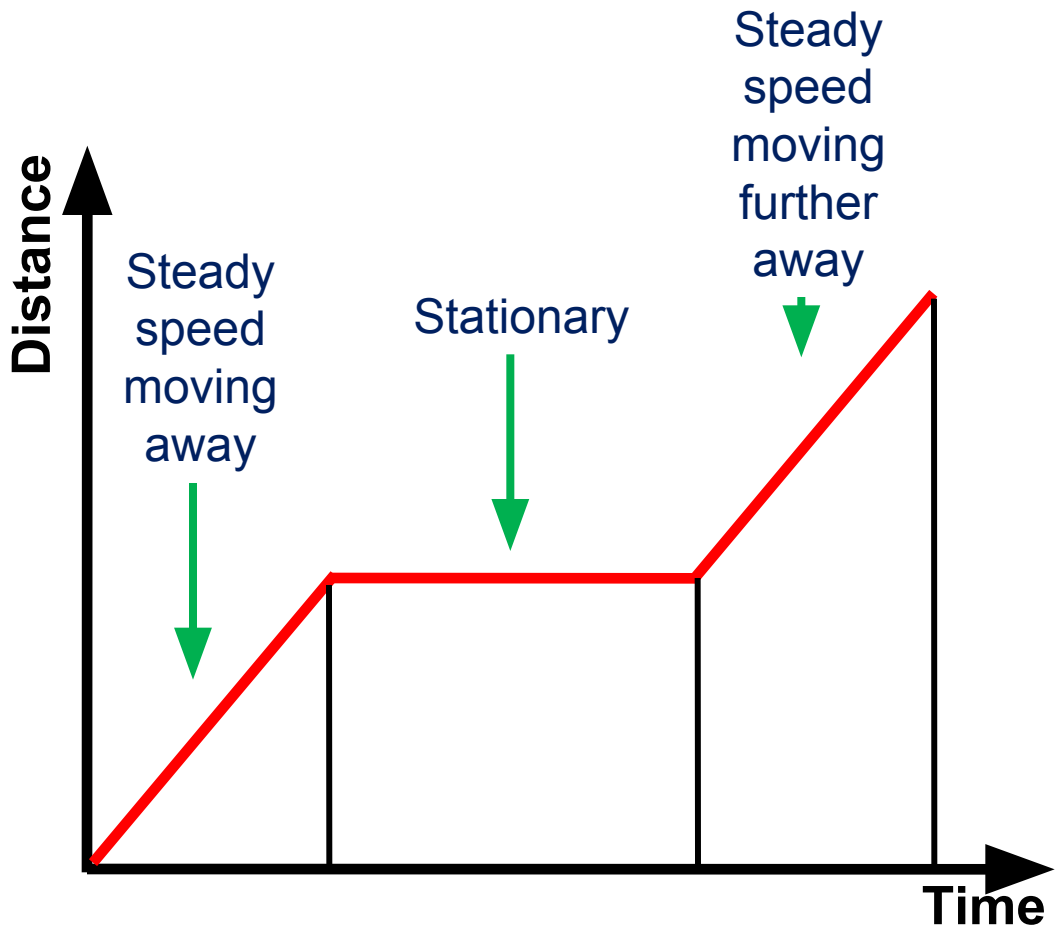
KEY CONCEPT

LO: To accurately interpret and draw real life graphs.

INTRODUCTION

What does this graph show?



St. Mary's Catholic High School, Muhaisnah

KEY CONCEPT

LO: To accurately interpret and draw real life graphs.

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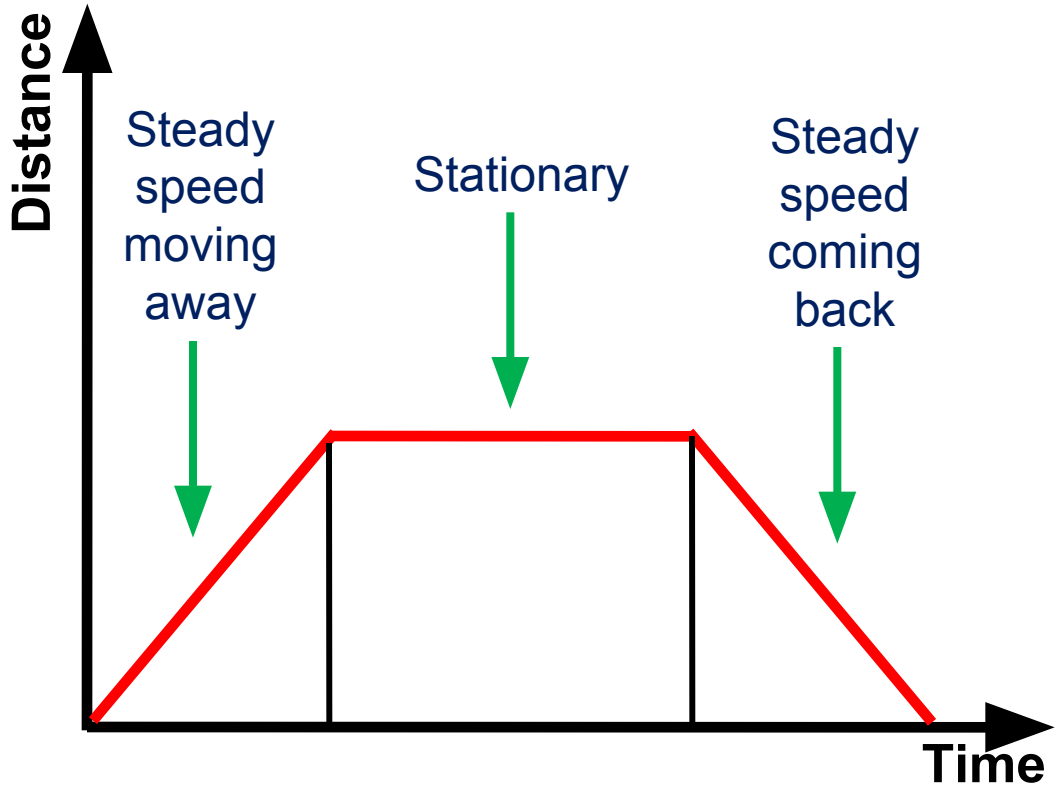

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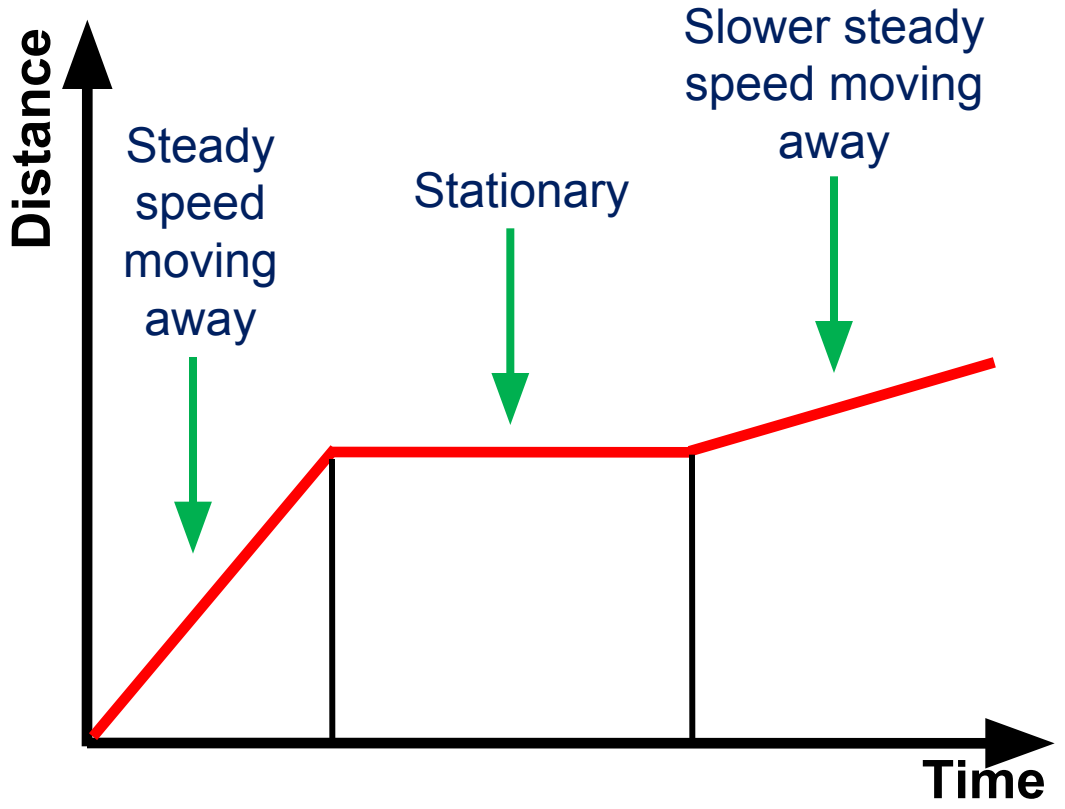
KEY CONCEPT

LO: To accurately interpret and draw real life graphs.

INTRODUCTION

What does this graph show?



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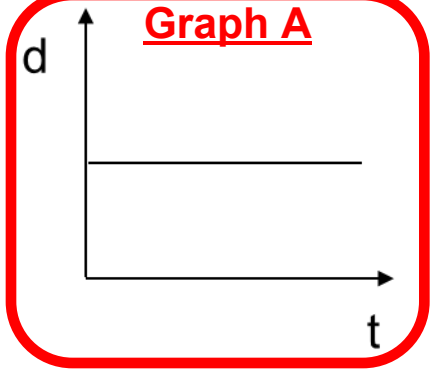
YOUR TURN

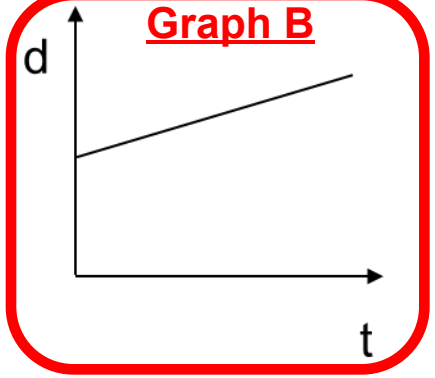
LO: To accurately interpret and draw real life graphs.

Match each graph with it's statement.

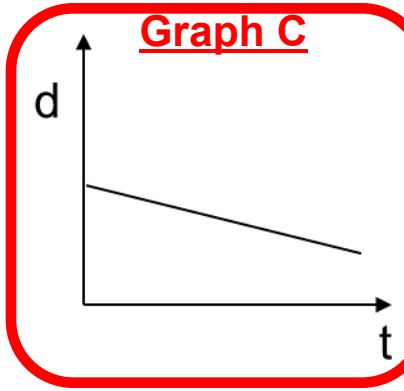
Graph A



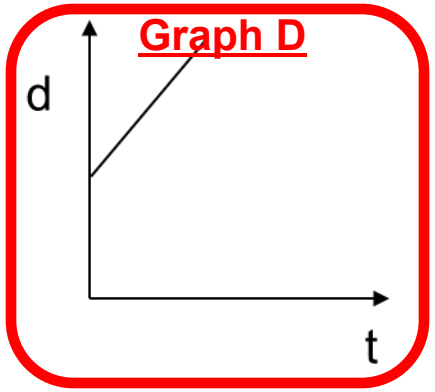
Graph B



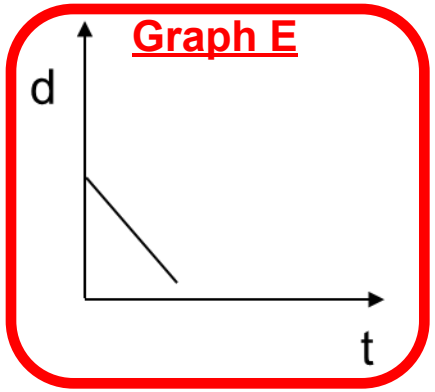
Graph C



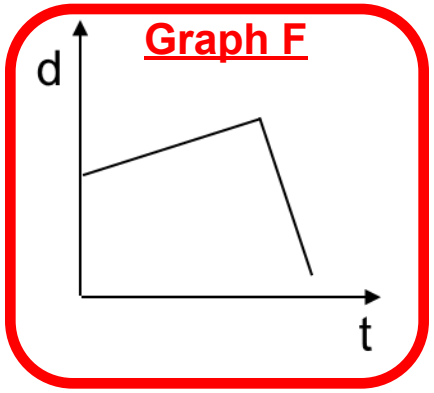
Graph D



Graph E



Graph F



- d decreases rapidly
- d remains constant
- d increases steadily
- d increases steadily, then decreases rapidly
- d decreases steadily
- d increases rapidly

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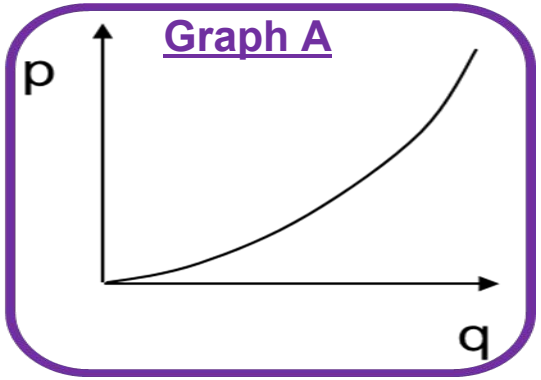
YOUR TURN

LO: To accurately interpret and draw real life graphs.

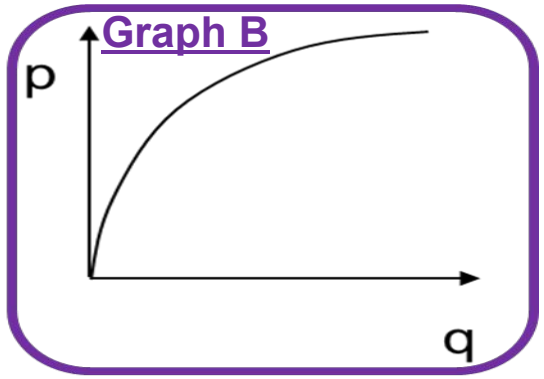
EXTENSION

Match each graph with it's statement.

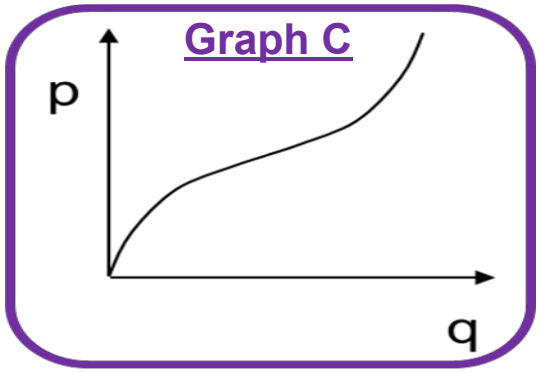
Graph A



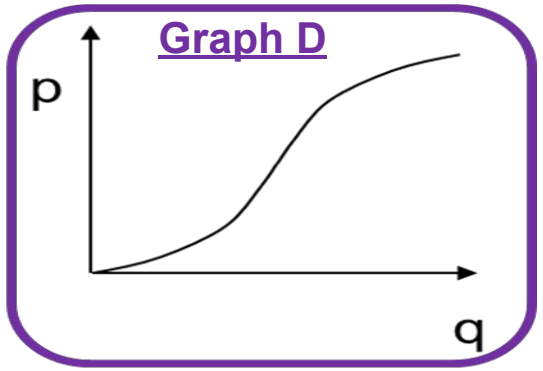
Graph B



Graph C



Graph D



p increases slowly at first, then more quickly then slowly again

p increases quickly at first, then more slowly

p increases slowly at first, then more quickly

p increases quickly at first, then more slowly, then quickly again

St. Mary's Catholic High School, Muhaisnah

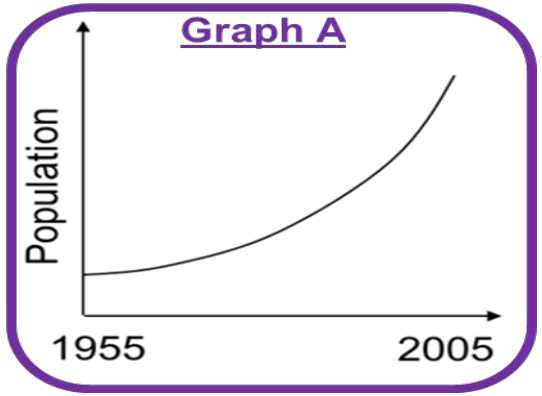
YOUR TURN

LO: To accurately interpret and draw real life graphs.

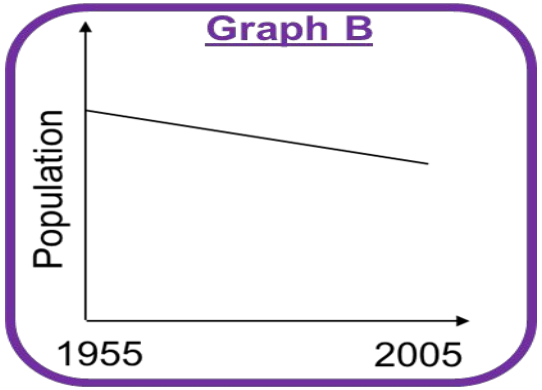
EXTENSION

Match each graph with it's statement.

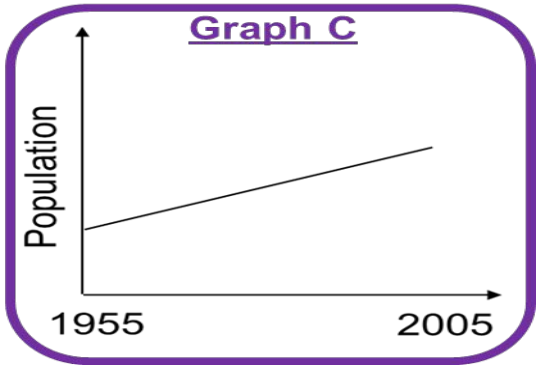
Graph A



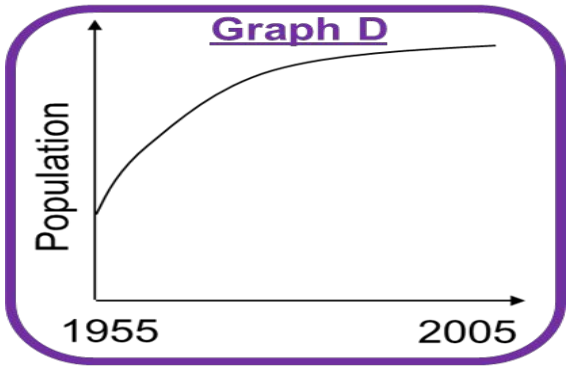
Graph B



Graph C



Graph D



The population increased slowly at first, but then increased more quickly.

The population increased quickly at first, but then increased more slowly.

The population increased steadily over the period.

The population declined steadily over the period.

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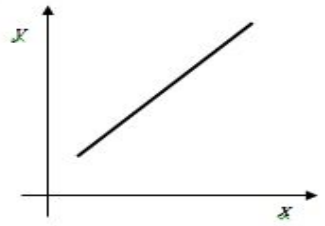
YOUR TURN

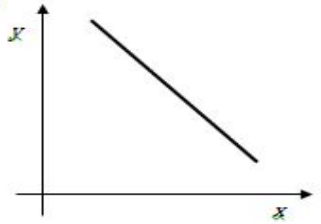
LO: To accurately interpret and draw real life graphs.

EXTENSION

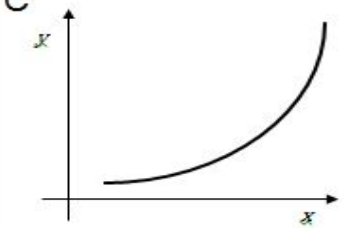
A



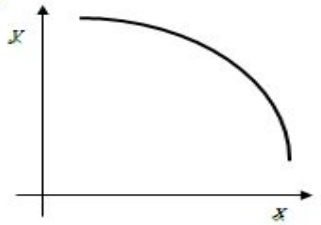
B



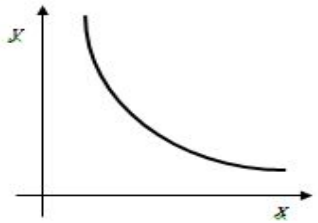
C



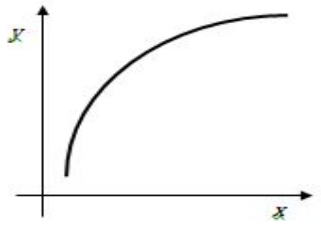
D



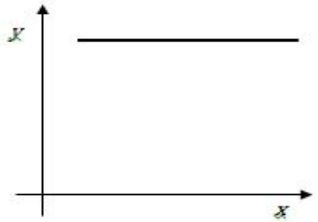
E



F



G



H

1 The temperature of a cup of tea left to cool to room temperature.	2 The number of Euros you can purchase for a given amount of Pounds.	3 The distance you run if you start running quickly and gradually slow down as you get tired.
4 The distance travelled by a car moving at constant speed on a motorway.	5 The distance from home of a car travelling home at a constant speed.	6 The distance travelled by an accelerating racing car.
7 The amount of infection left in the body as it responds to treatment, slowly at first, then more rapidly.	8 The speed of a car travelling on a motorway, which is neither accelerating nor braking.	9 The temperature of water in a kettle that is first filled and then boiled.
10 The amount of radioactive Uranium in a sample as it decays over time.	11 The speed of a racing car accelerating at a constant rate.	12 The number of litres of fuel left in the tank of a car moving at constant speed.
13 The number of rice grains on each square of a chessboard if the number on each square is twice the number on the previous square.	14 The distance from home of a cyclist who has stopped for lunch.	15 The height of a bungee jumper as she drops from a bridge and falls to the river below, before the bungee starts to pull her back up.
16 An impossible journey.	17 (Write your own)	18 (Write your own)

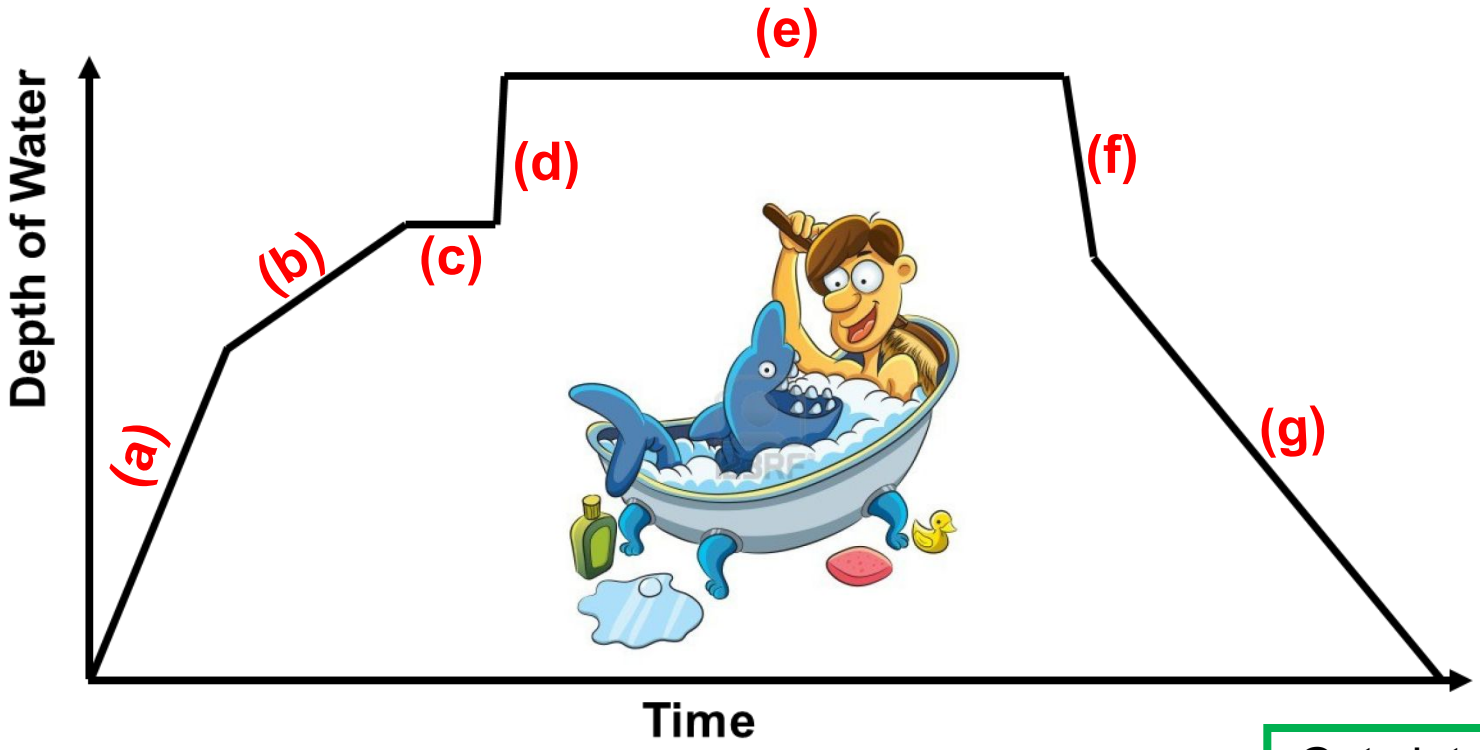
St. Mary's Catholic High School, Muhaisnah

MINI PLENARY

LO: To accurately interpret and draw real life graphs.

EXAMPLE

The graph below shows the variation in the depth of water as Earnest takes his early morning bath. Match the different parts of the graph to the statements shown.



Relaxes in bath

Pulls the plug

Hot and cold taps turned on

Gets out of bath

Turns off hot tap

Gets into bath

Cold tap turned off, gets undressed

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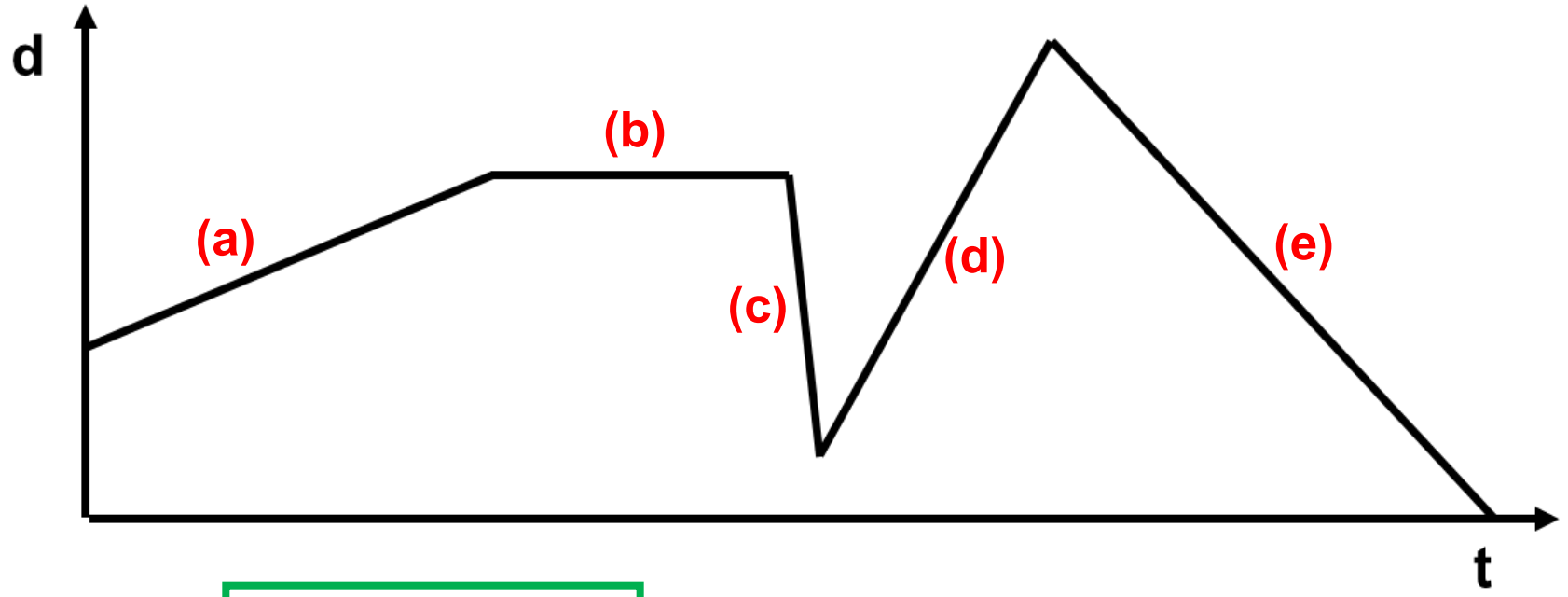
CORE TASK

LO: To accurately interpret and draw real life graphs.

TASK 1

A test tube containing a chemical liquid is used in an experiment. During the experiment the depth d of the liquid changes with time t. Match the different parts of the graph to the statements below.



Some liquid is poured out quickly

The test tube is emptied

Liquid is added slowly to the test tube

Some liquid is poured in quite quickly

The level of the liquid remains constant

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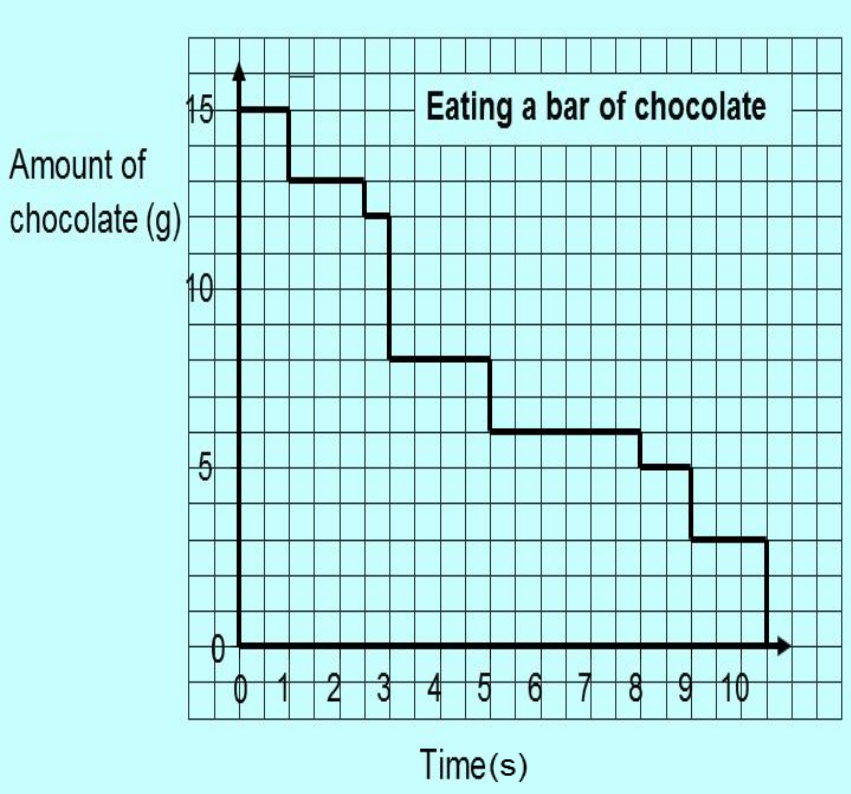
CORE TASK

LO: To accurately interpret and draw real life graphs.

TASK 2



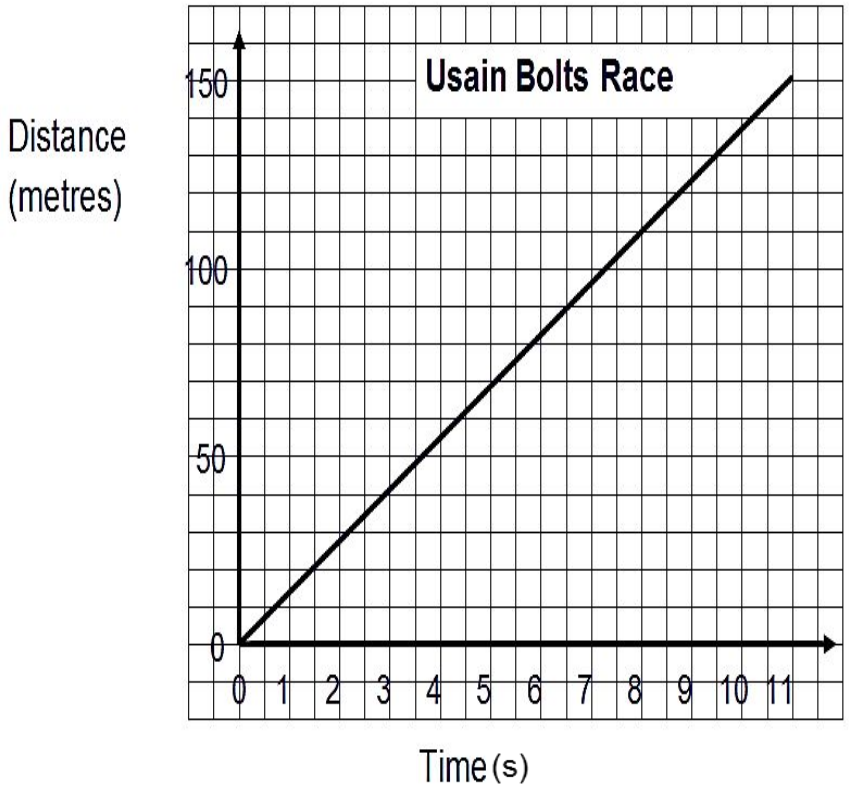
a) How much does the bar of chocolate weigh?

b) How much does the chocolate weigh after 5 seconds?

c) How long does it take for the chocolate bar to be eaten?

d) What is happening between 5 and 8 seconds?

2)



a) How far has he ran after 4.5 seconds?

b) How long has it taken Usain to run 130 metres?

c) How far has he ran after 8 seconds?

d) Why does the line go through the origin?

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CORE TASK

LO: To accurately interpret and draw real life graphs.

TASK 3

1) Create your own real life graph by labelling each part and the axes.
2) Write a commentary about what your graph shows.
3) How would you calculate the average speed from your graph?

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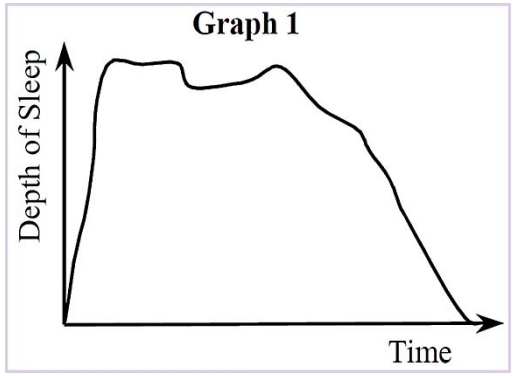
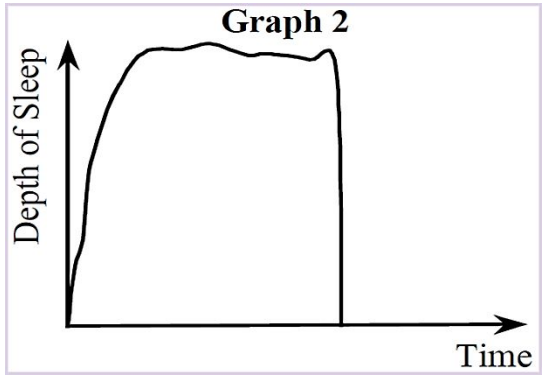
Real life Graphs

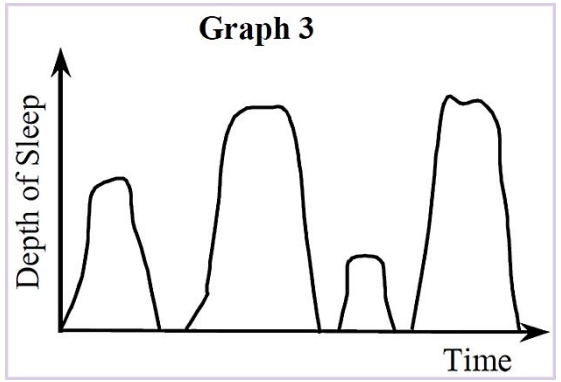
LO: To accurately interpret and draw real life graphs.

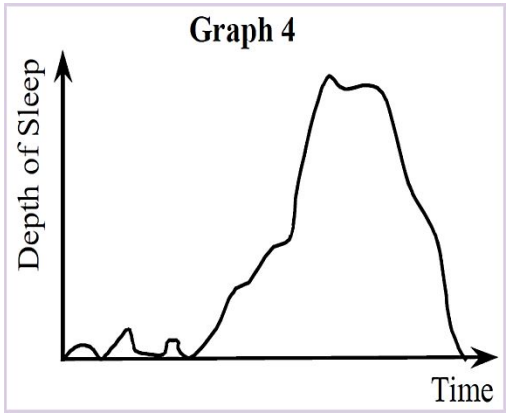
EXTENSION

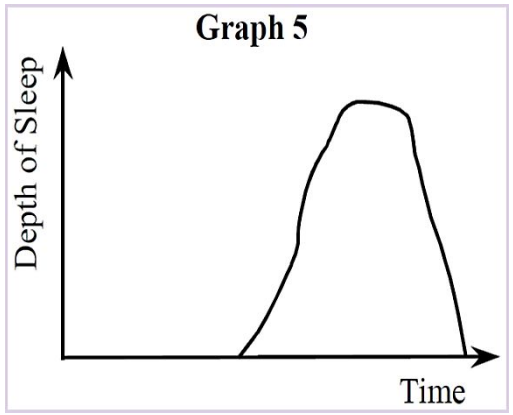
Match the graphs with their respective descriptions.











James: I slept really well until a pair of cats decided to have a fight in our back garden

Nasir: I kept waking up. Must have been the cheese!

Libby: Great! I got to sleep straight away and slept 'till morning

Karen: I was wide awake! By the time I got to sleep it was nearly morning!

Mike: I dozed for ages before dropping off

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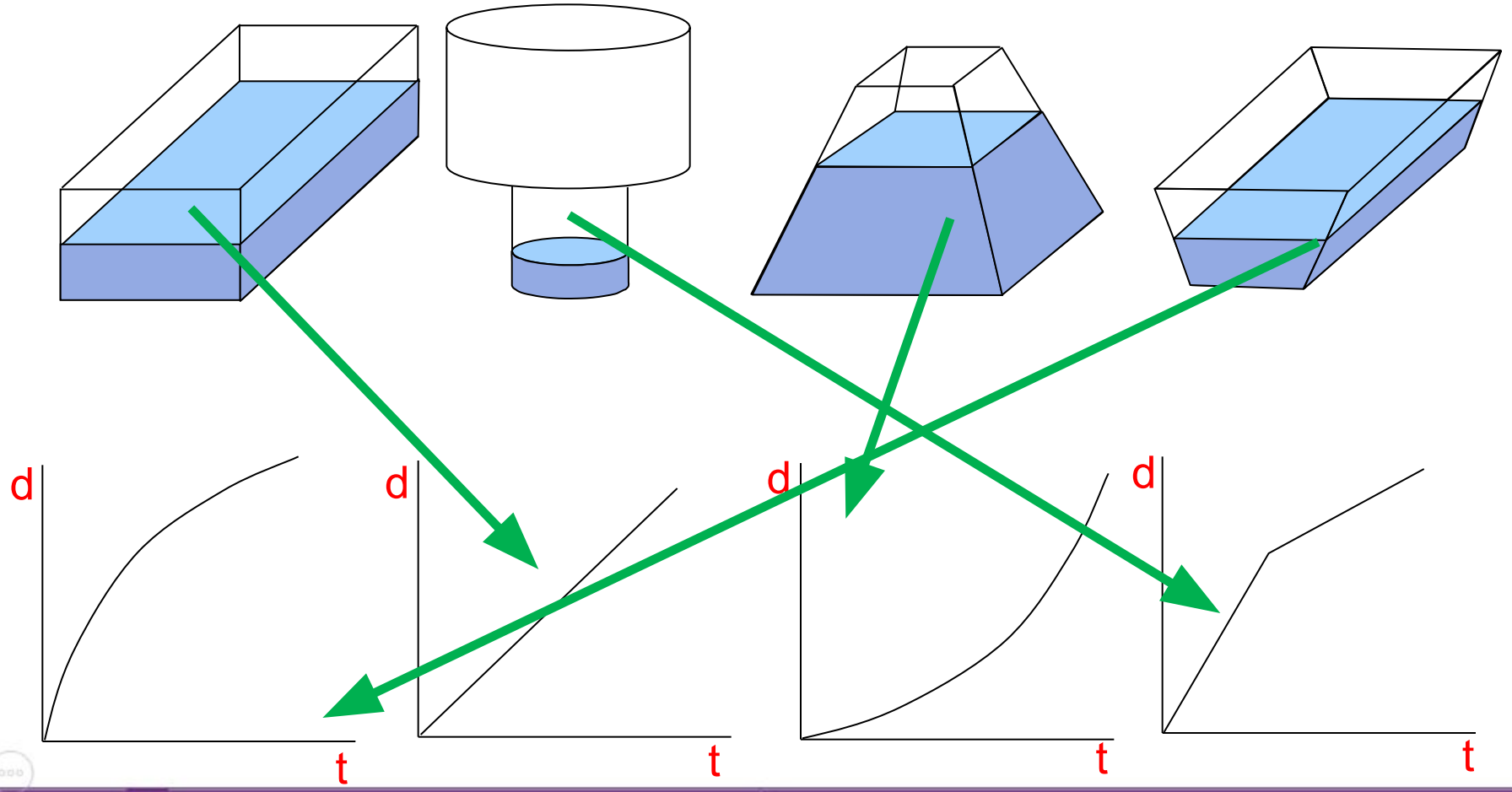
Real life Graphs

LO: To accurately interpret and draw real life graphs.

PLENARY

Water is poured into each of the containers below at a constant rate. The graphs show how the depth (d) of the water varies with time (t). Match the containers to their corresponding graphs.



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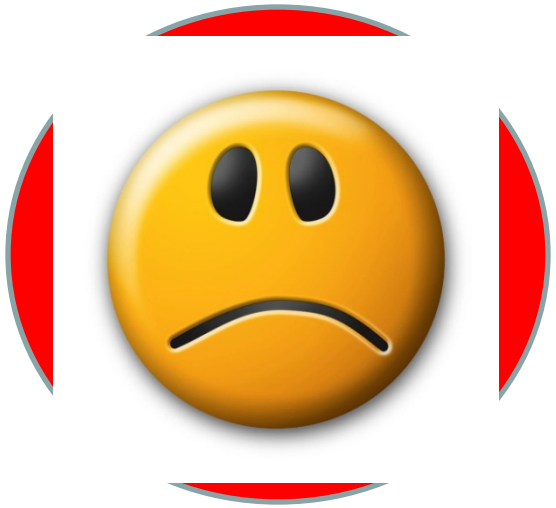
Real life Graphs

LO: To accurately interpret and draw real life graphs.

Plenary Activity

How well do you understand the task?



I don't understand

I nearly understand

I fully understand