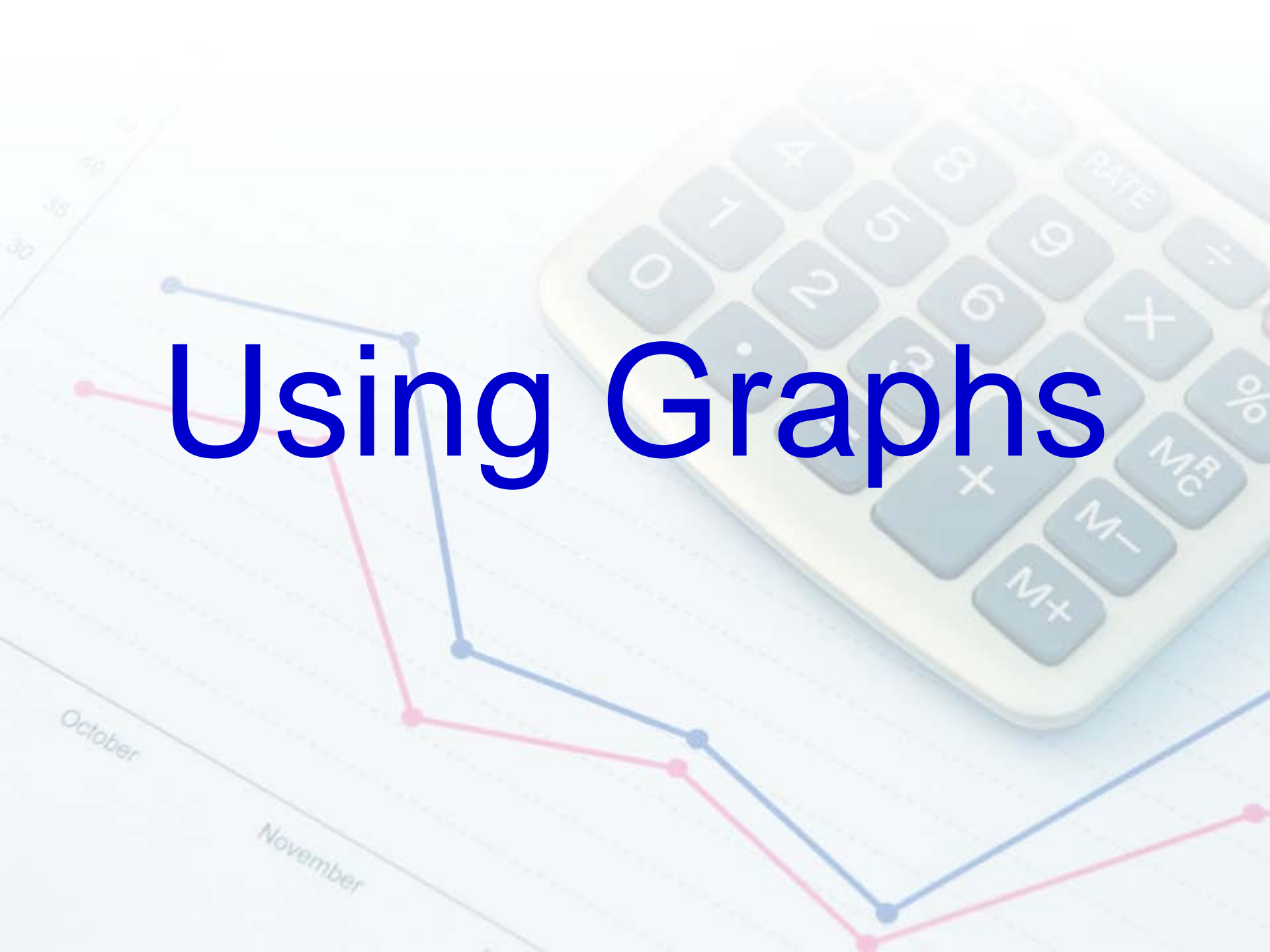


Using Graphs



Relationship to Junior Certificate Syllabus

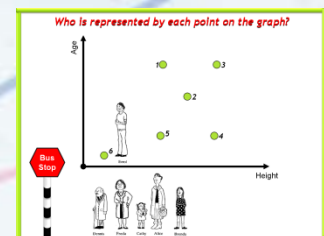
Topic	Description of topic <i>Students learn about</i>	Learning outcomes <i>Students should be able to</i>
4.5 Relations without formulae	Using graphs to represent phenomena quantitatively.	<ul style="list-style-type: none">– explore graphs of motion– make sense of quantitative graphs and draw conclusions from them– make connections between the shape of a graph and the story of a phenomenon– describe both quantity and change of quantity on a graph

Prior Knowledge

Students will have studied:

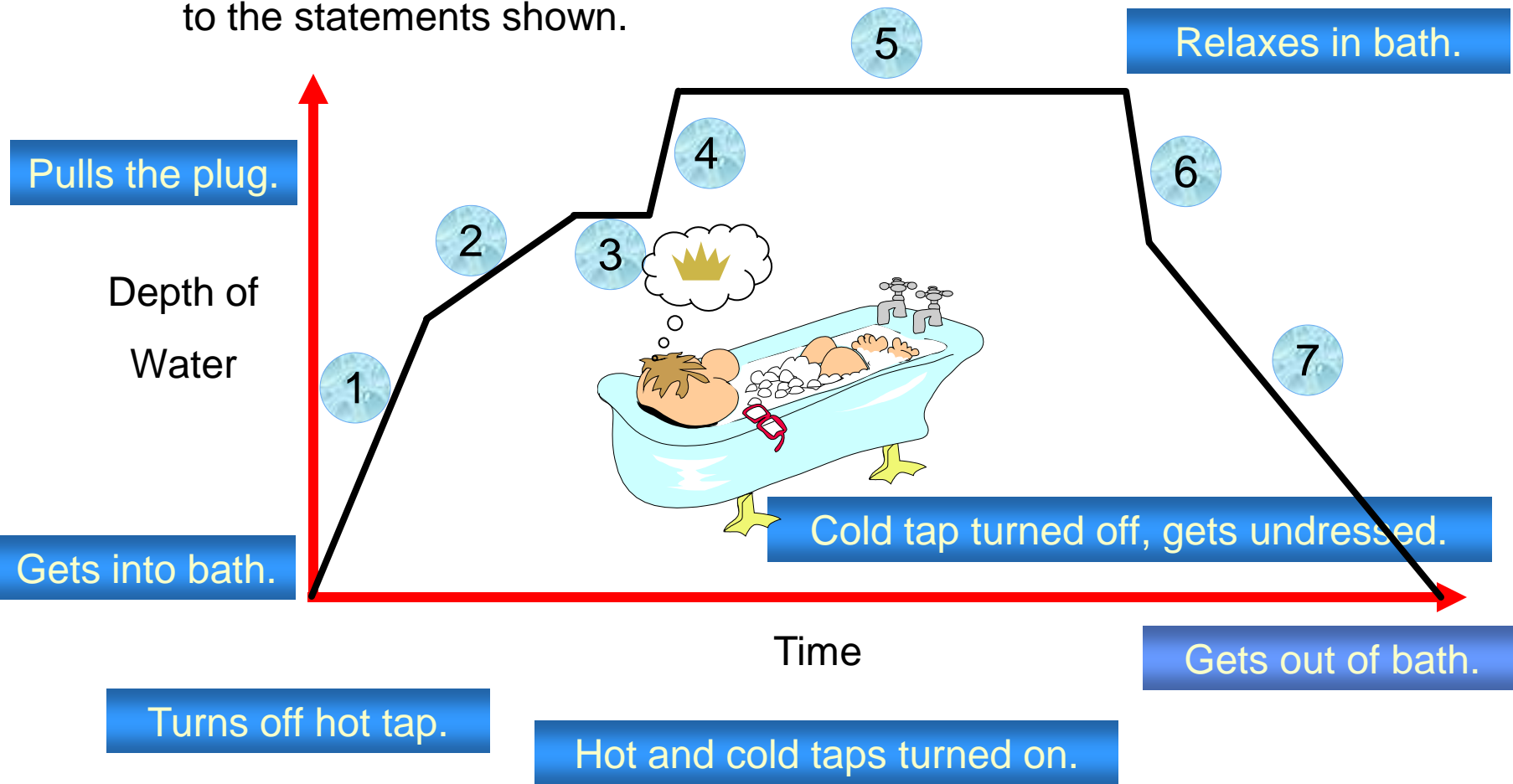
- Graphing of coordinates
- Slope of a line
- The concept of speed as distance/time

They will have become familiar with the fact that the X-axis and the Y-axis are used to represent many other variables as well as these two.



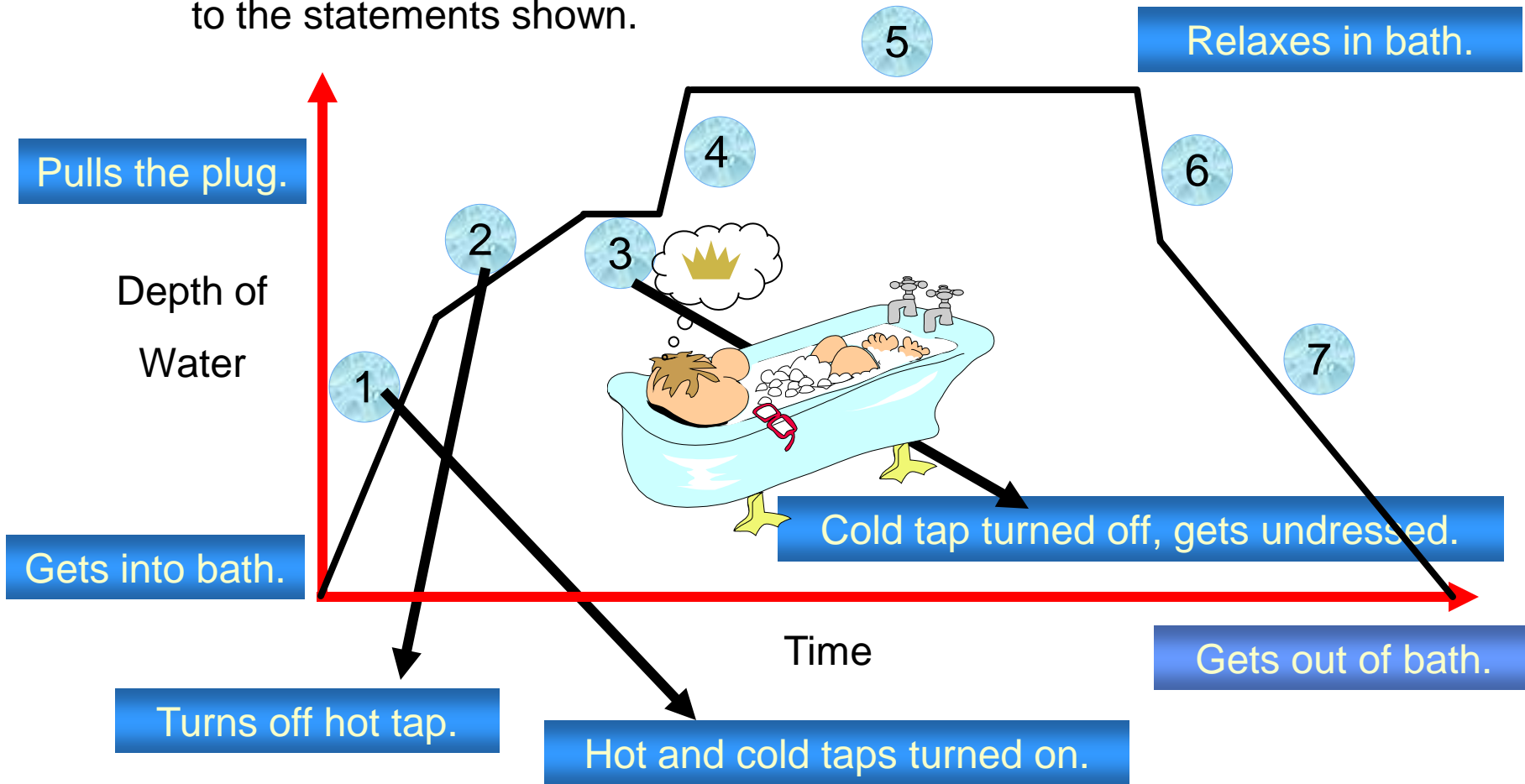
Graphs of Real Life Situations

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



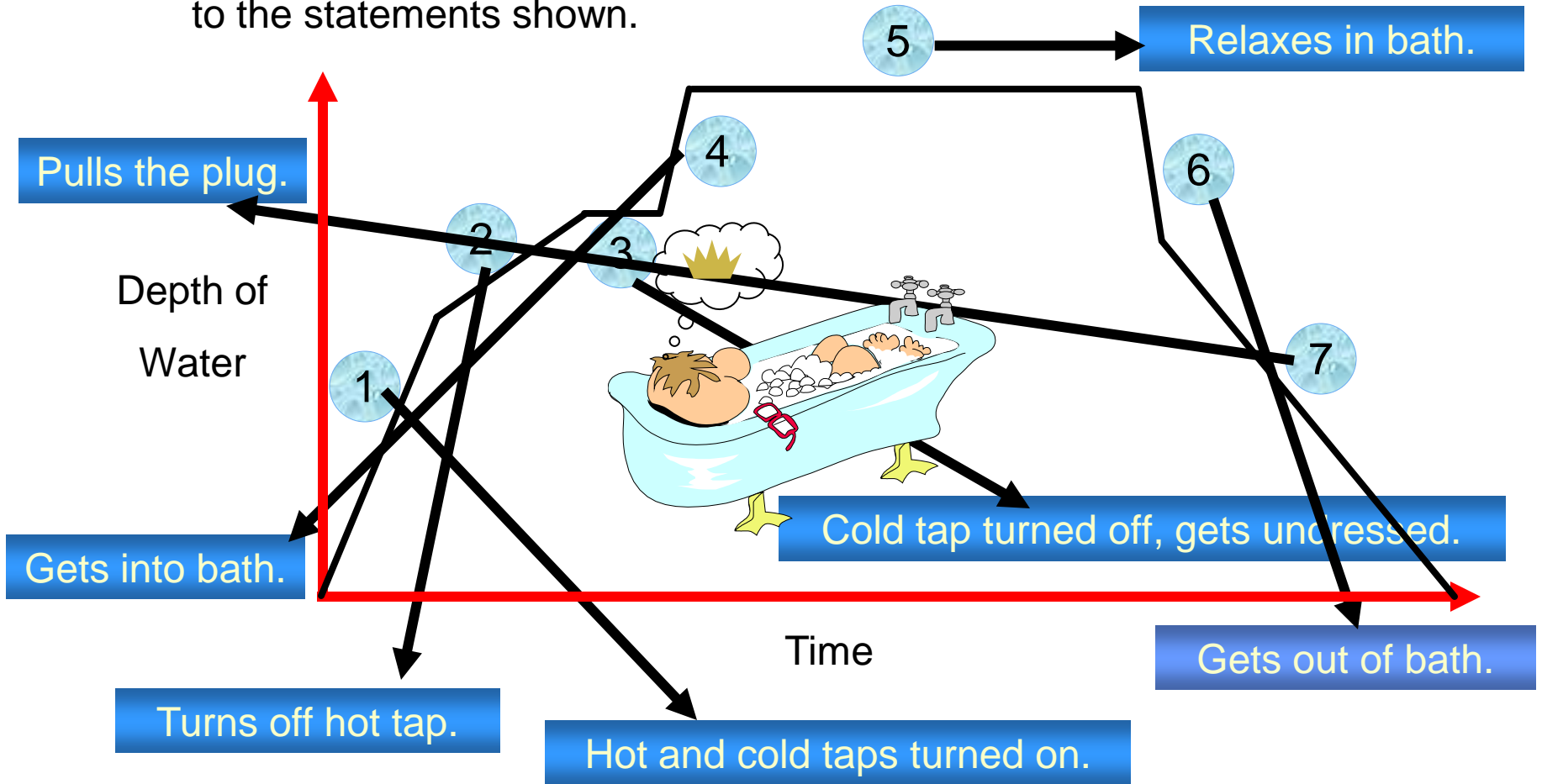
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Graphs of Real Life Situations

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



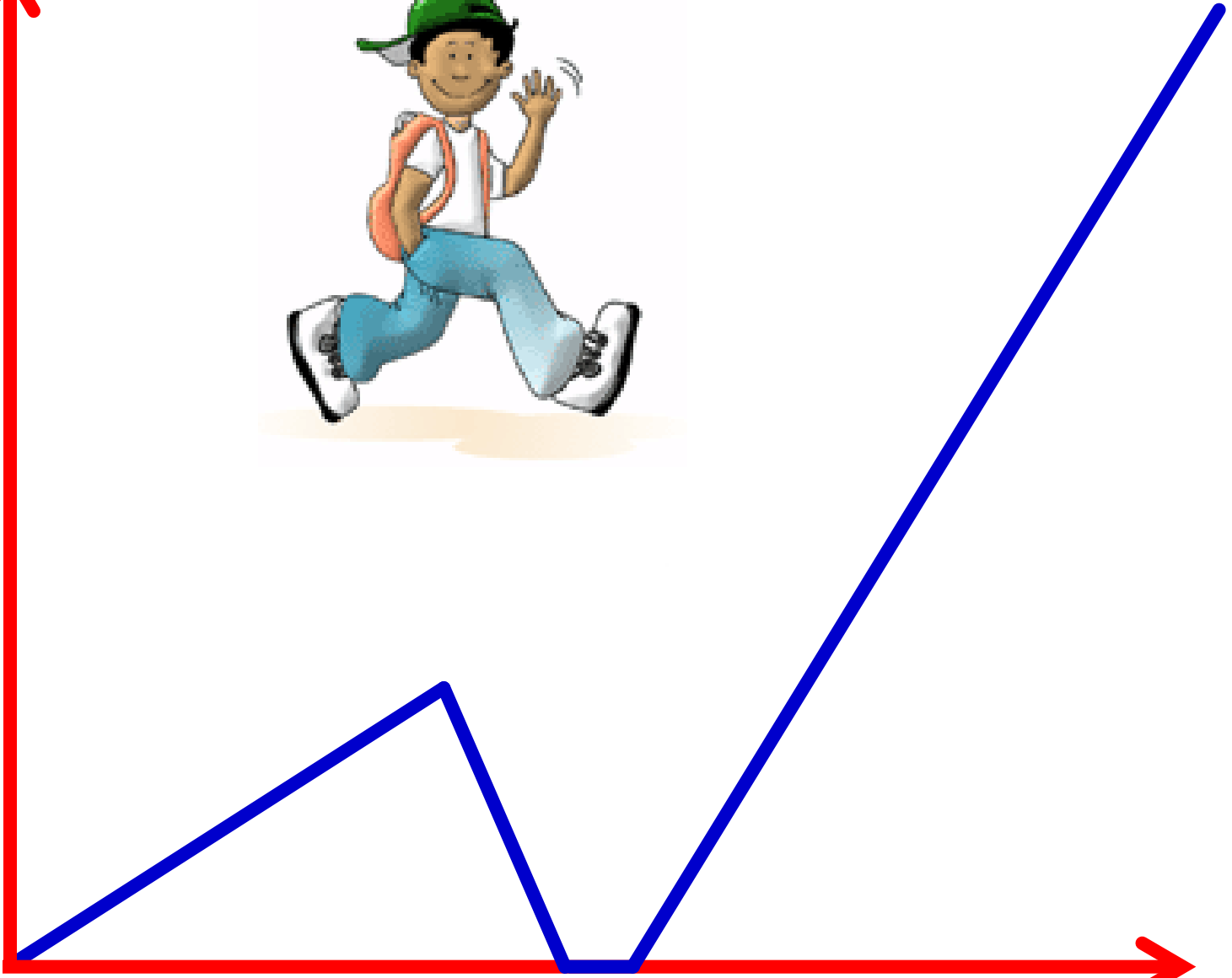
Telling a Story

- *I started walking to school at a steady pace and then realised that I had left my books at home, so I hurried back to get them. Then my mother drove me to school so I wouldn't be late.*
- Draw a graph with position from home on the y axis and time on the x axis.

Position, [m]

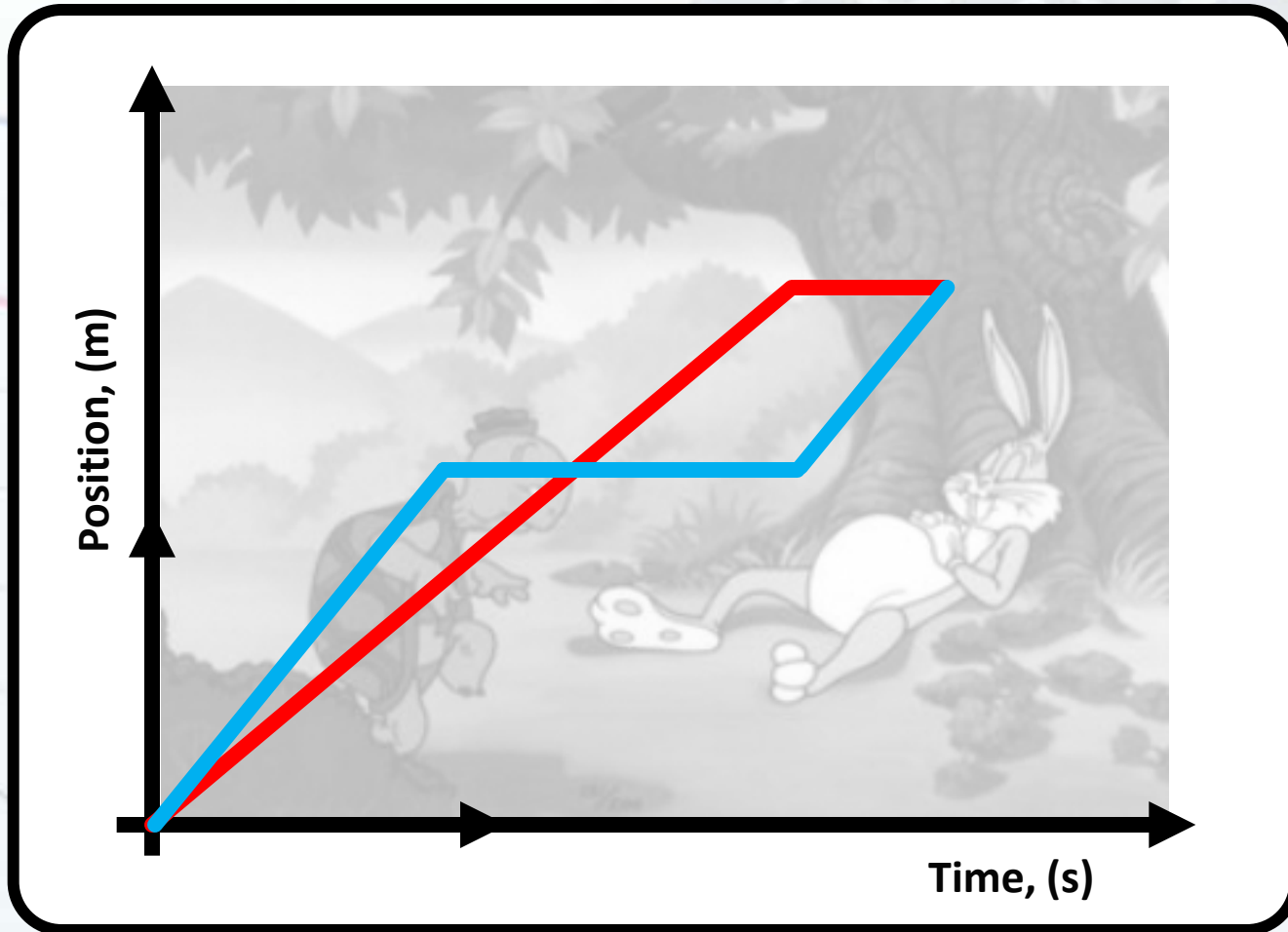


Time, [s]



Telling a Story

*Do you remember the story of the hare and the tortoise?
Use this graph to re-tell the story:*



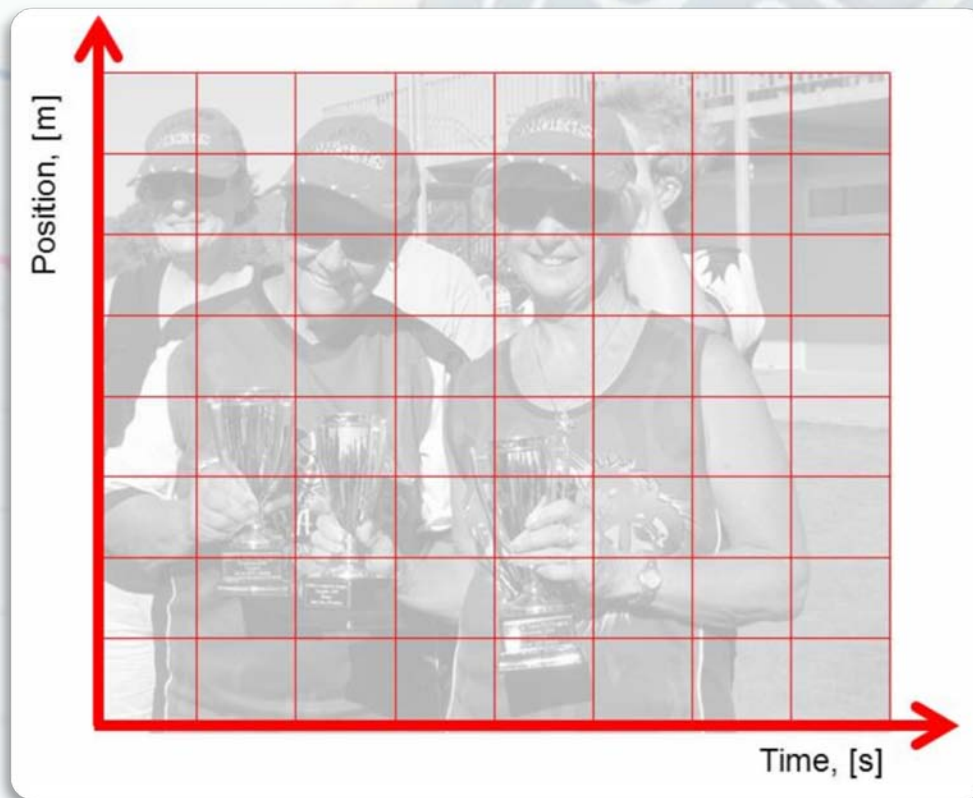
Discuss this in your group and write a short story about it.

Telling a Story

Mary and John run against each other in a 200 metre race.

Mary's time is 25 seconds and John's time is 40 seconds.

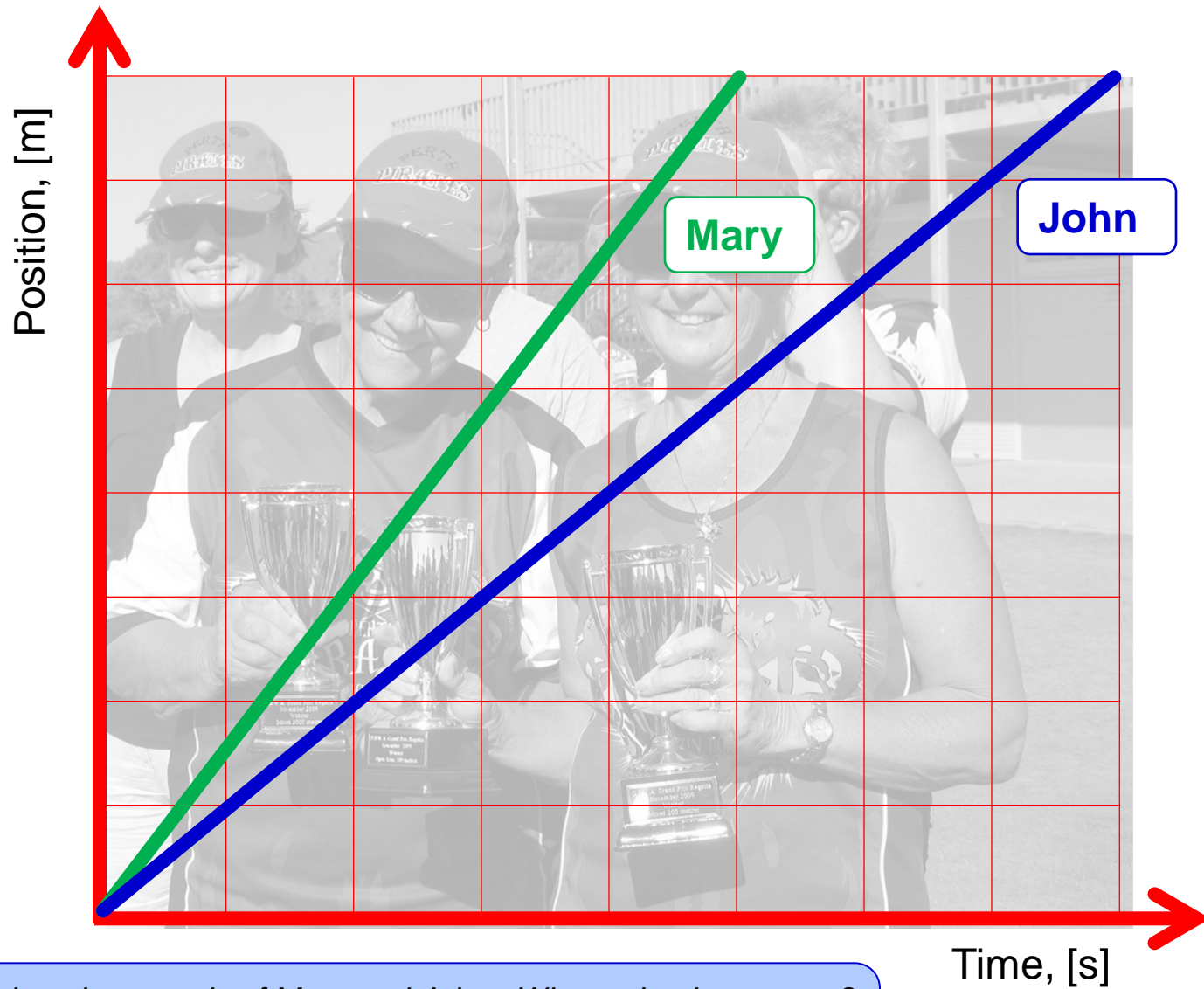
Draw graphs to show their runs using just one set of scales and axes, assuming that they each ran at a steady speed throughout.



Calculate the speeds of Mary and John. What units do you use?

Whose graph has a bigger slope? Calculate the slopes.

How do the graphs show that Mary ran faster than John?



Calculate the speeds of Mary and John. What units do you use?
 Whose graph has a bigger slope? Calculate the slopes.
 How do the graphs show that Mary ran faster than John?

Matching Graphs Exercise

Set 1:

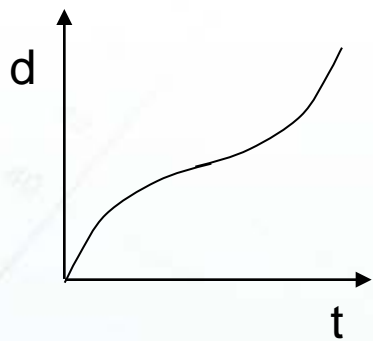
A selection of distance, time graphs.

Set 2:

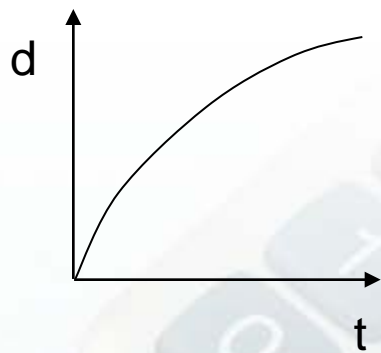
A selection of graphs of various scenarios.

Set 3:

A selection of graphs where containers are being filled at a constant rate and the depth of water over time is examined.



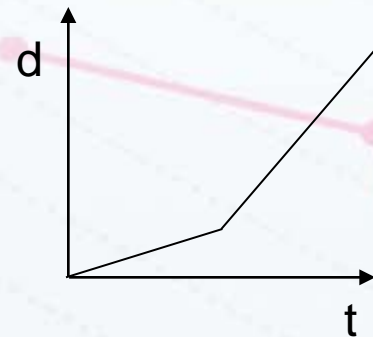
1-1



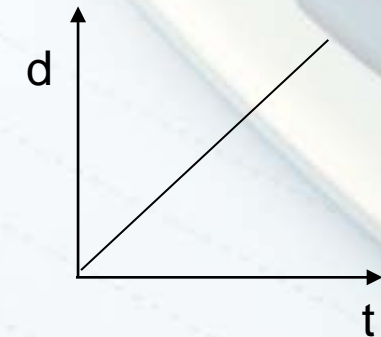
1-2

1-A : Moving at a steady constant pace.

1-B : Moving at a fast pace moving gradually to a slower pace.



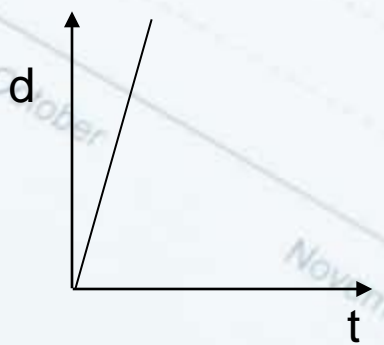
1-3



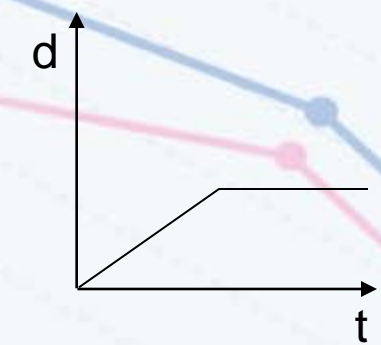
1-4

1-C : Moving at a fast steady pace.

1-D : Moving fast, then slowing slightly, then going faster again.



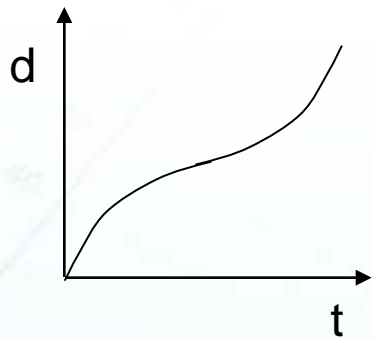
1-5



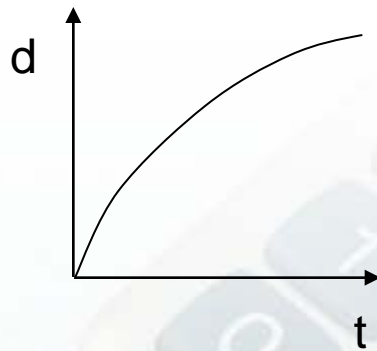
1-6

1-E : Moving at a steady pace, then stops for a period of time.

1-F : Moving at a slow pace and then rapidly increases.



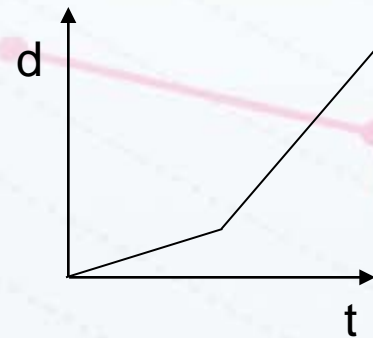
1-1
1-D



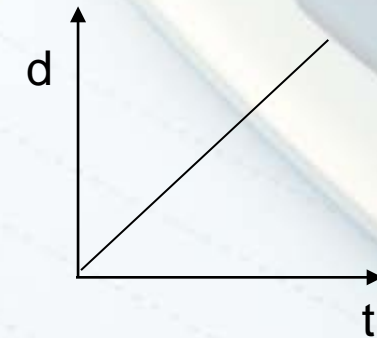
1-2
1-B

1-A : Moving at a steady constant pace.

1-B : Moving at a fast pace moving gradually to a slower pace.



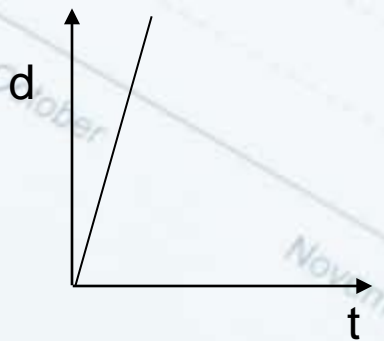
1-3
1-F



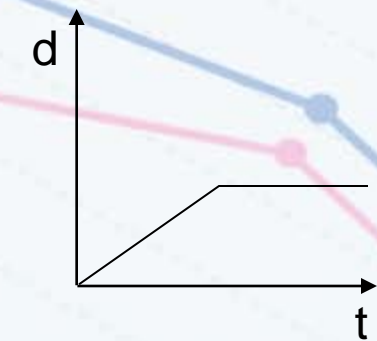
1-4
1-A

1-C : Moving at a fast steady pace.

1-D : Moving fast, then slowing slightly, then going faster again.



1-5
1-C

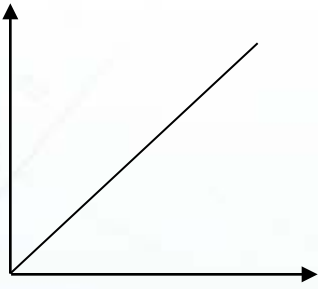


1-6
1-E

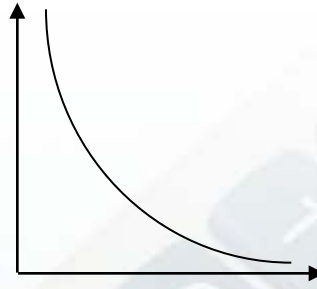
1-E : Moving at a steady pace, then stops for a period of time.

1-F : Moving at a slow pace and then rapidly increases.

2-1



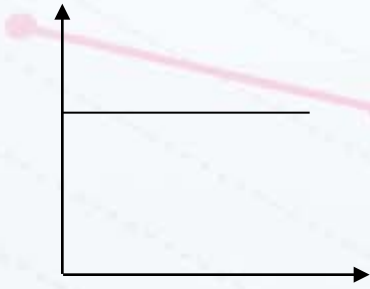
2-2



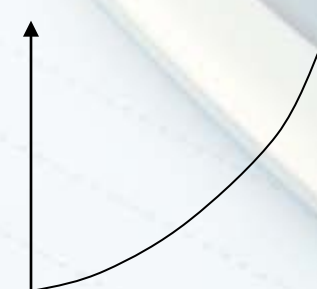
2-A : The graph shows the cost of hiring an electrician per hour including a fixed call out fee.

2-B : The graph shows the connection between the length and width of a rectangle of a fixed area

2-3



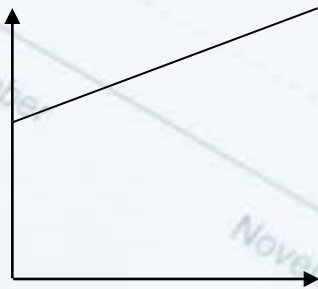
2-4



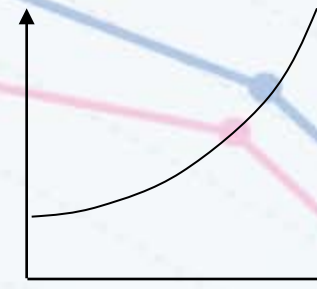
2-C : The graph shows speed against time for a car travelling at a constant speed.

2-D : The graph shows the area of a circle as the radius increases.

2-5



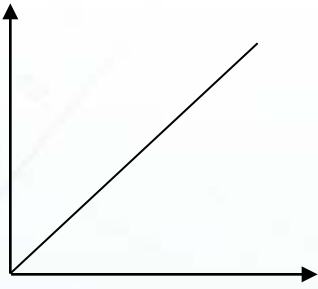
2-6



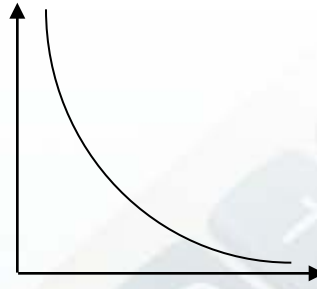
2-E : The graph shows the width of a square as the length of the square increases

2-F : The population from 1954 increased slowly at first, but then increased more quickly.

2-1
2-E



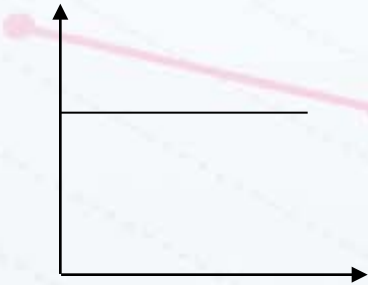
2-2
2-B



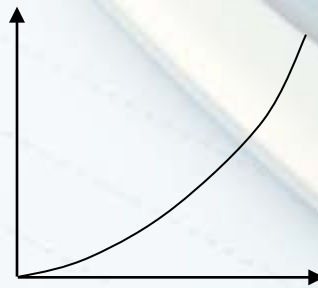
2-A : The graph shows the cost of hiring an electrician per hour including a fixed call out fee.

2-B : The graph shows the connection between the length and width of a rectangle of a fixed area

2-3
2-C



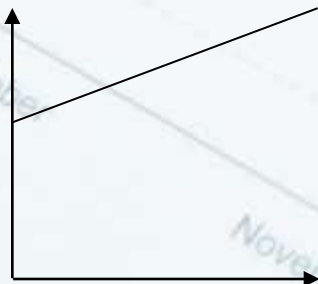
2-4
2-D



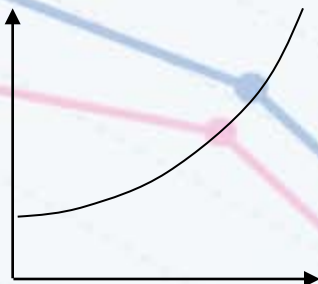
2-C : The graph shows speed against time for a car travelling at a constant speed.

2-D : The graph shows the area of a circle as the radius increases.

2-5
2-A

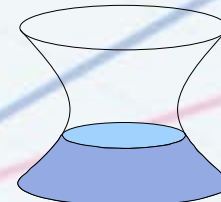
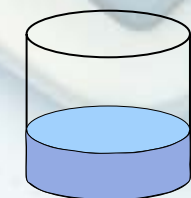
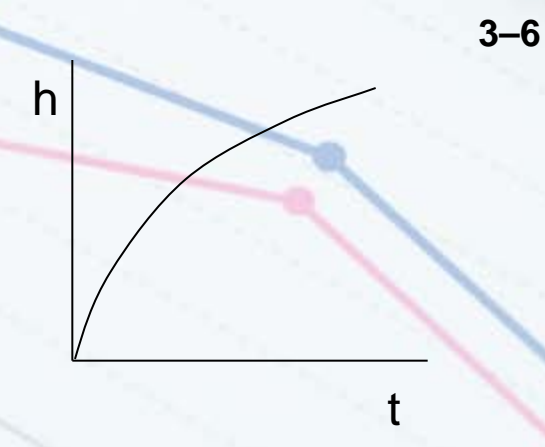
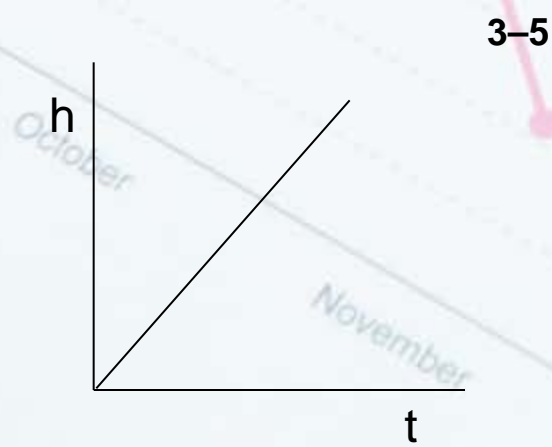
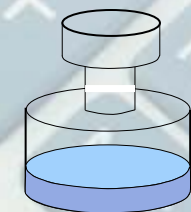
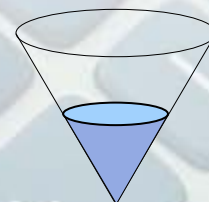
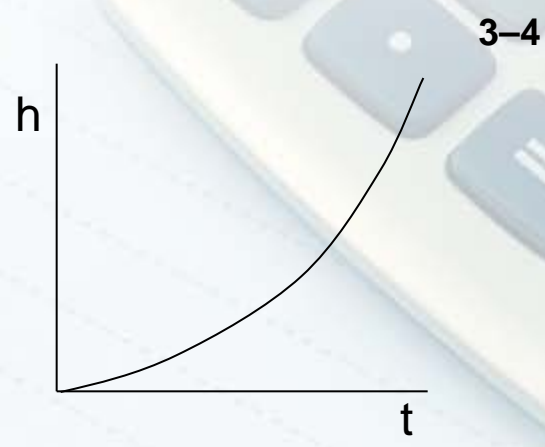
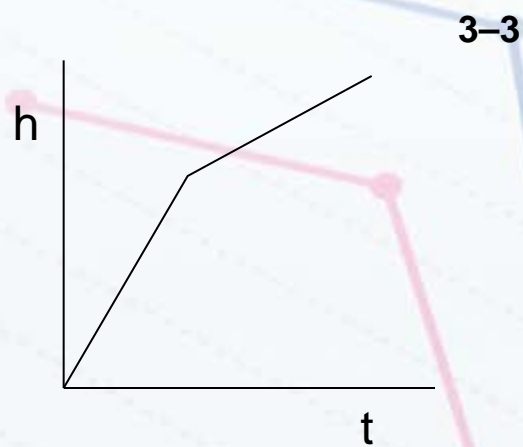
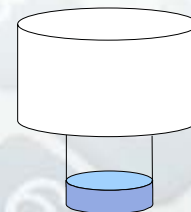
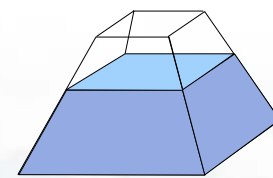
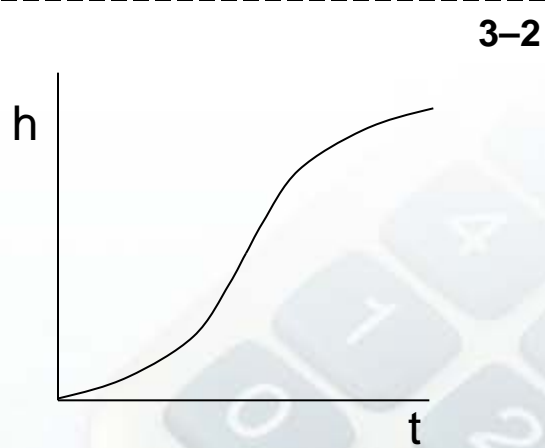
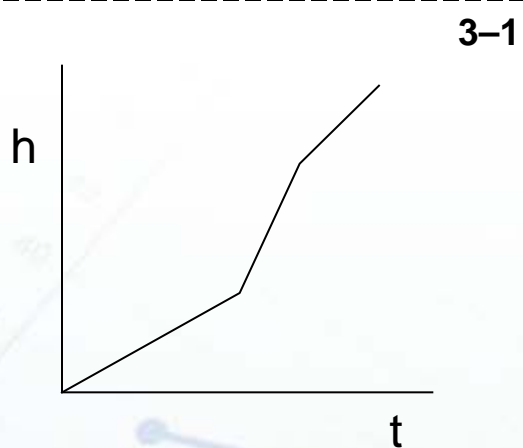


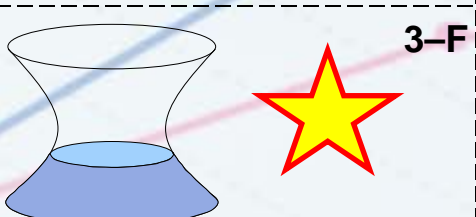
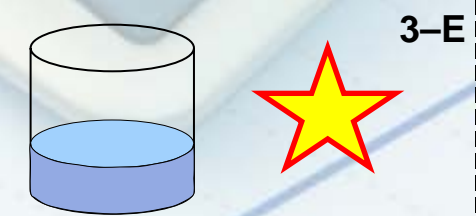
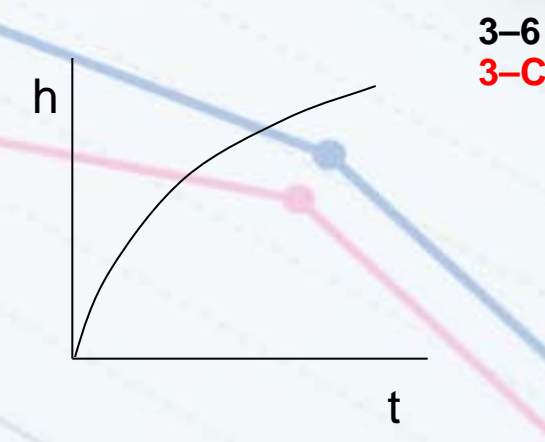
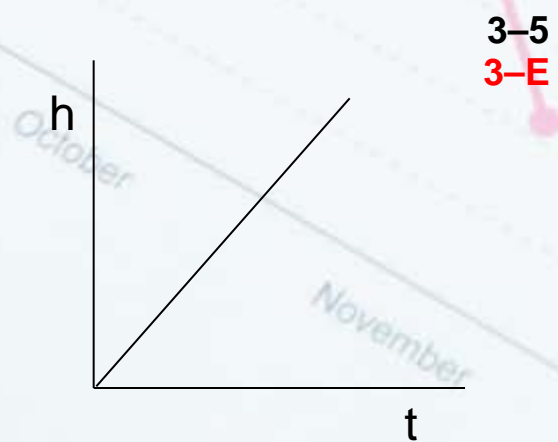
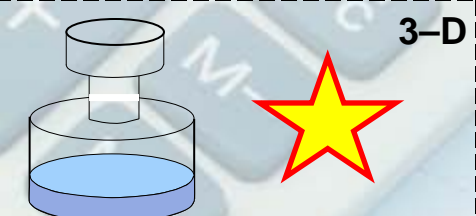
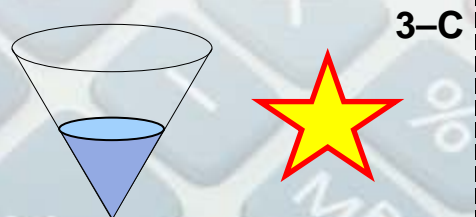
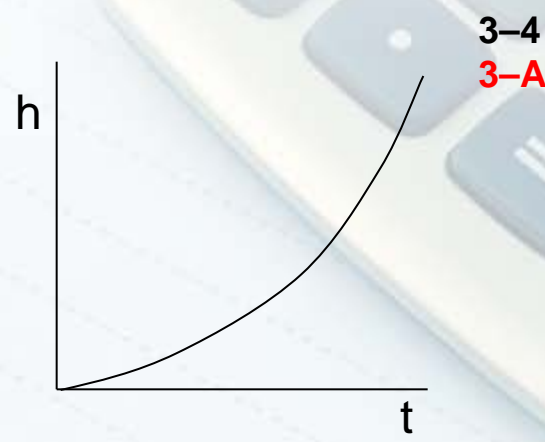
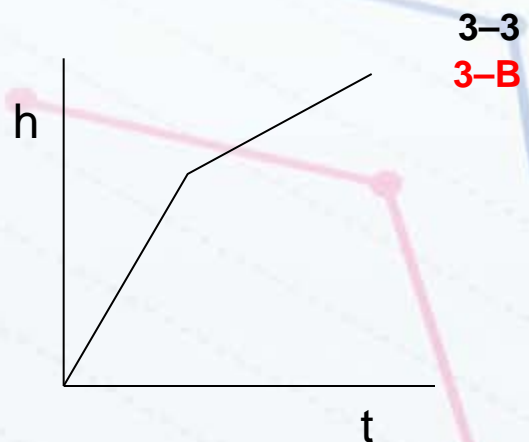
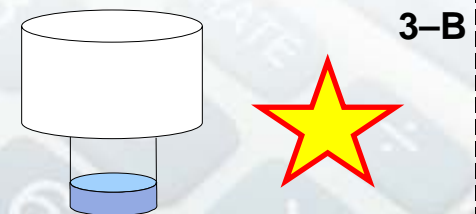
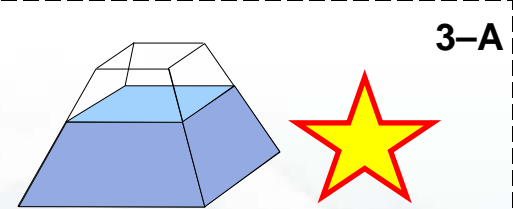
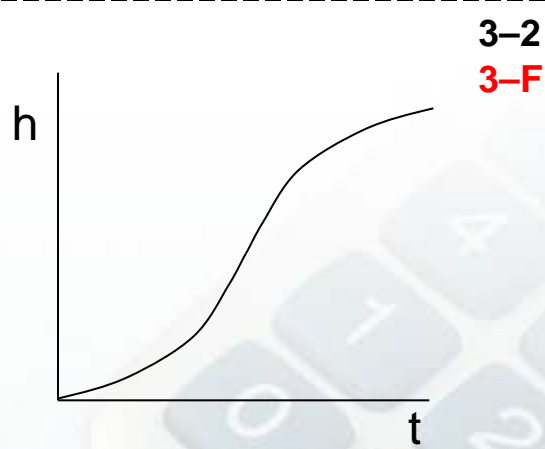
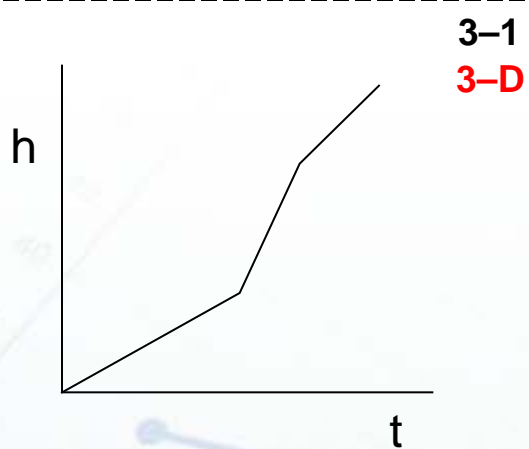
2-6
2-F



2-E : The graph shows the width of a square as the length of the square increases

2-F : The population from 1954 increased slowly at first, but then increased more quickly.





Go Motion Sensor

