

Forces: Speed, Distance and Time

Year 7: Lesson 1

WC 24th September 2012

Speed, Distance and Time

- **WALT: Calculate speed, distance or time using an equation**
- I must be able to calculate speed, distance and time from the equation
- I should be able to demonstrate how to do this from a practical
- I could use a graph to also measure these things

Distance, Time and Speed

The unit of distance is:

The metre (m)

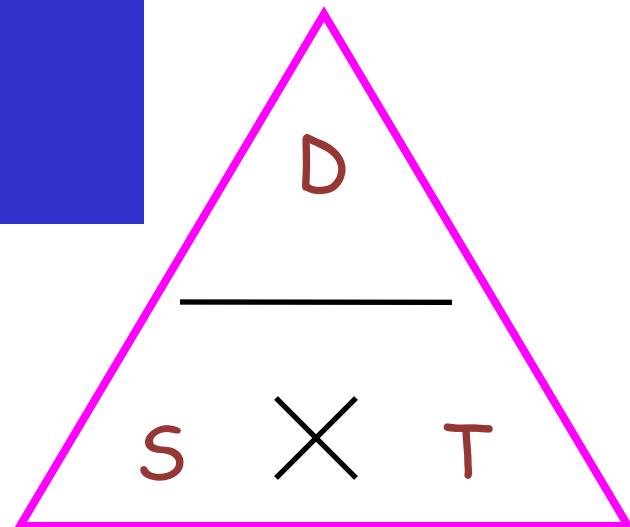
The unit of time is:

The second (s)

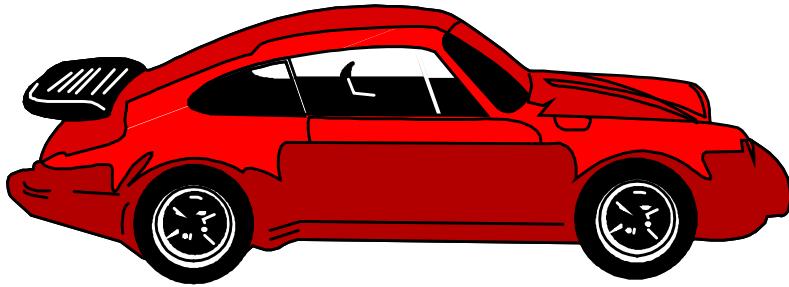
The unit of speed is:

metres per second
(m/s or ms^{-1})

$$\text{Speed} = \frac{\text{distance (in metres)}}{\text{time (in seconds)}}$$



A simple example.....

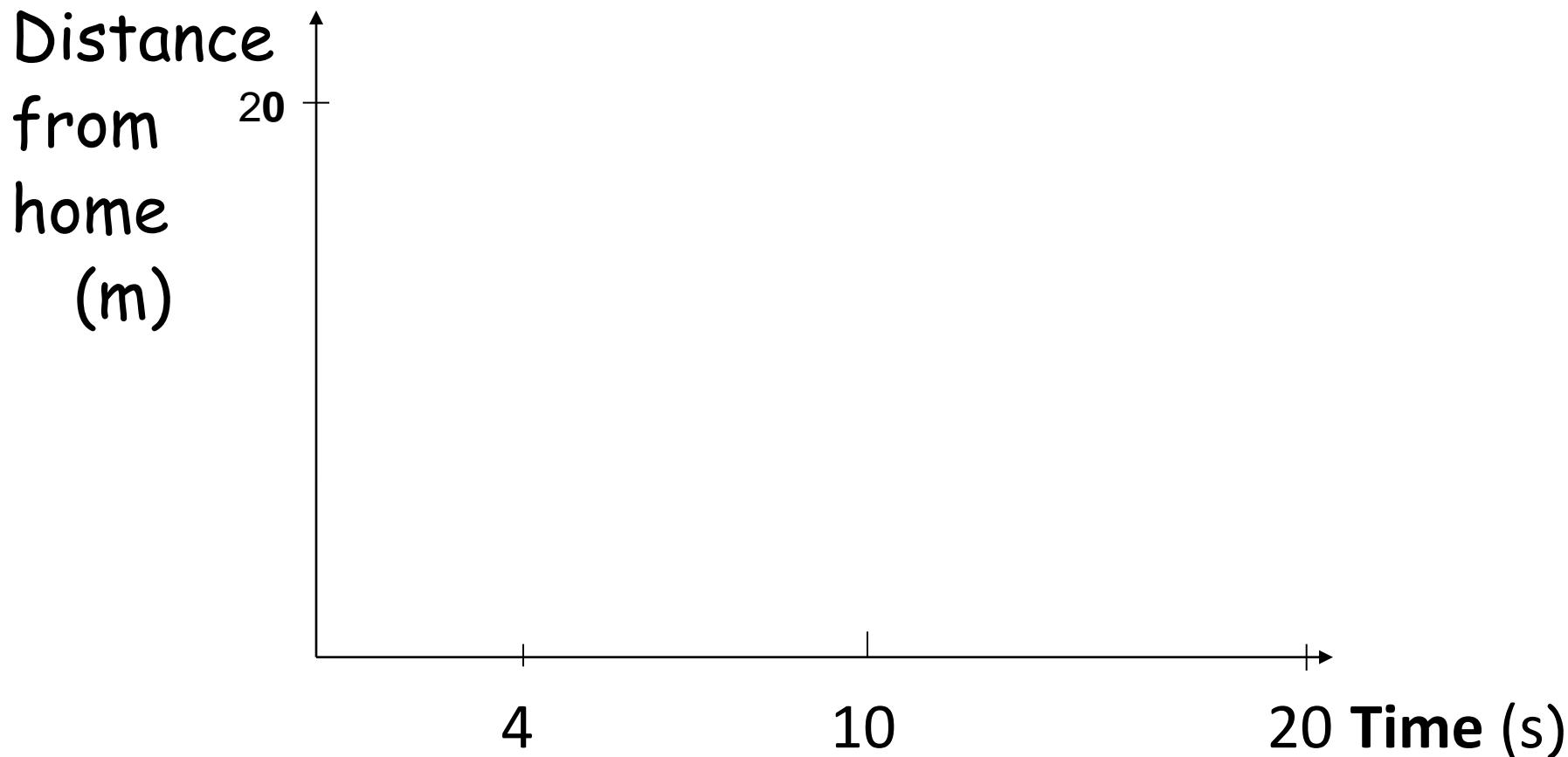


2. The Porsche travelled at 40 m/s for 2 minutes. How far did it go in metres ?

$$Distance = Speed \times Time = 40 \text{ m/s} \times 120 \text{ s} = 4800 \text{ m}$$

Have a go - Sketch the motion

A cat runs 20 metres in 4 seconds to hide behind a shed.
It stays there for 6 seconds and then walks back in 10
seconds.



2) Horizontal line =

4) Diagonal line downwards =

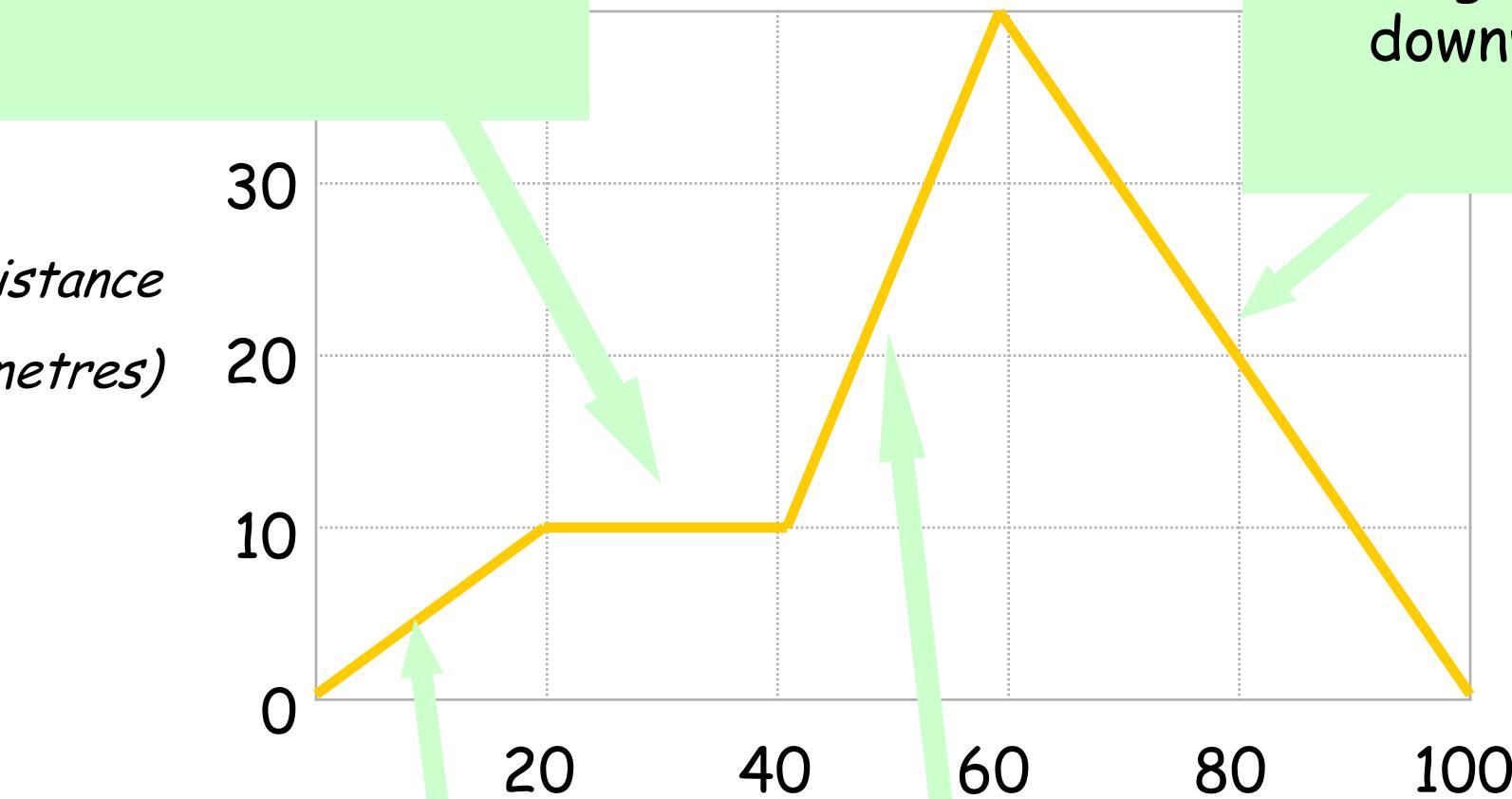
Distance
(metres)

30
20
10
0

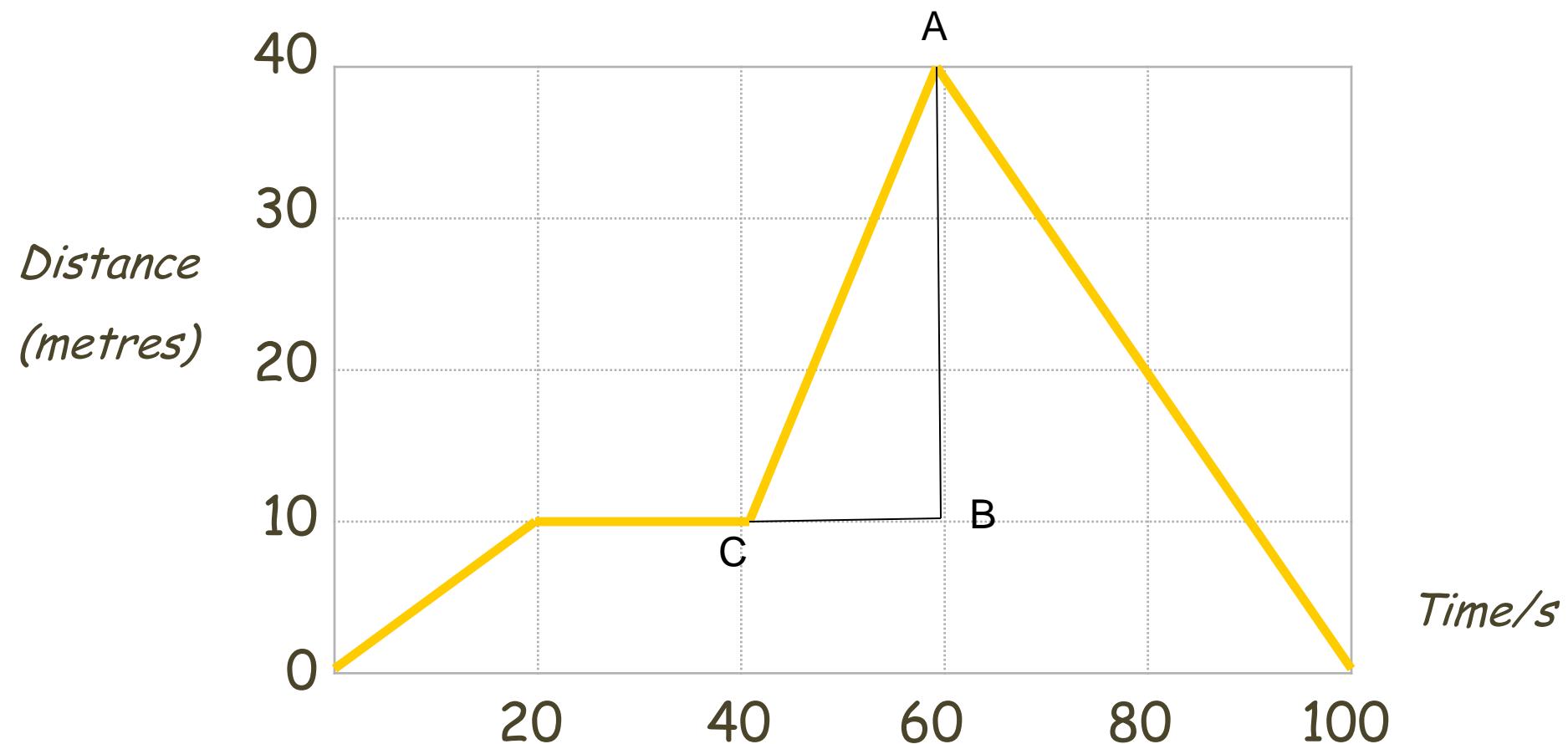
Time (s)

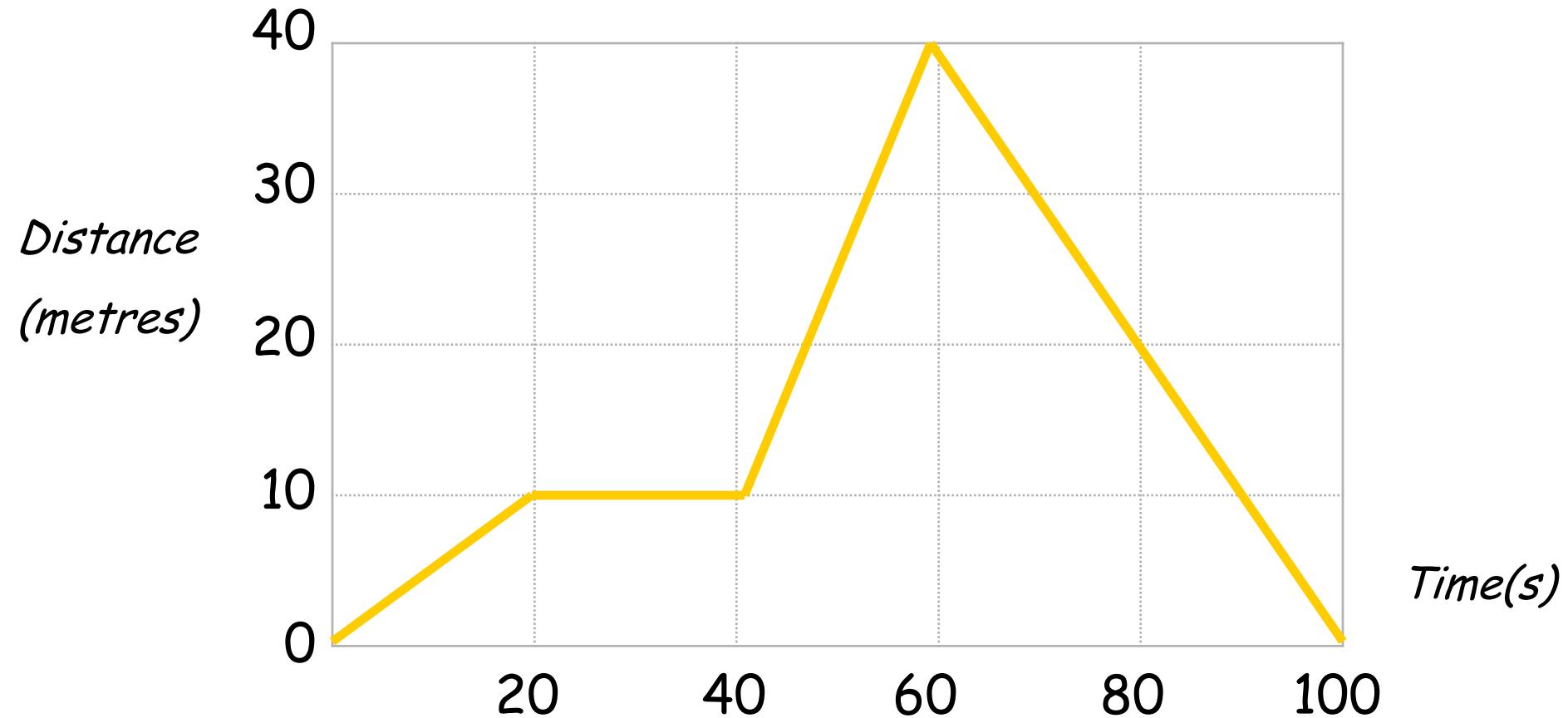
1) Diagonal line =

3) Steeper diagonal line =



Measuring gradient





- 1) What is the speed during the first 20 seconds?
- 2) How far is the object from the start after 60 seconds?
- 3) What is the speed during the last 40 seconds?
- 4) When was the object travelling the fastest?

MEASURING SPEED....a little experiment

- Set up ramp and car
- Measure 3 different ramp heights of your choice using a ruler
- Measure time to pass finish line with stop clock
- Record in table (ramp height, distance, time, speed)
- Things to remember :
 - Left hand column for independent variable
 - Leave column for your speed calculations

Plenary – Speed cameras

- ✖ In pairs, work out how speed cameras measure motorists' speed.
 - ✖ Think about how you would calculate the speed using the below equipment and your knowledge of the equation for speed. You have 2 minutes.
- + Imaginary equipment:
- ✖ Camera that takes 2 pictures, 0.5 seconds apart
 - ✖ Lines across a road that are 1.5m apart
 - ✖ Speeding car