

Using Equations – Speed and Pressure

Year 8: Lesson 1

WC 6th January 2013

Using Equations

- **WALT: Practise using equations to calculate speed and pressure**
- I must be able to calculate speed, distance and time from the equation
- I must be able to calculate pressure from an equation
- I should be able to use a graph to analyse speed, distance and time

Distance, Time and Speed

The unit of distance is:

The metre (m)

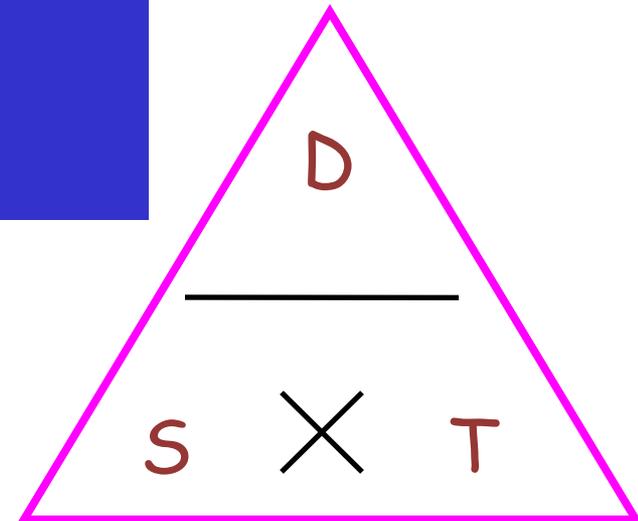
The unit of time is:

The second (s)

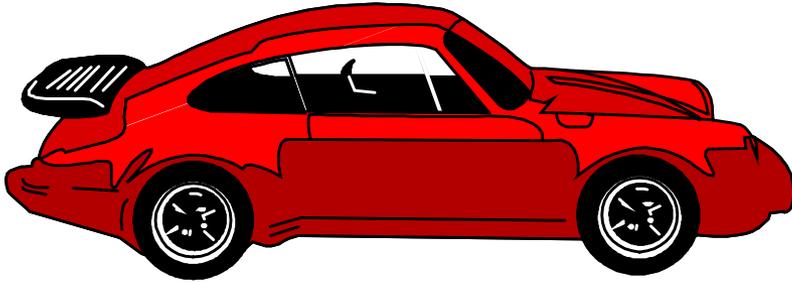
The unit of speed is:

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

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



A simple example.....

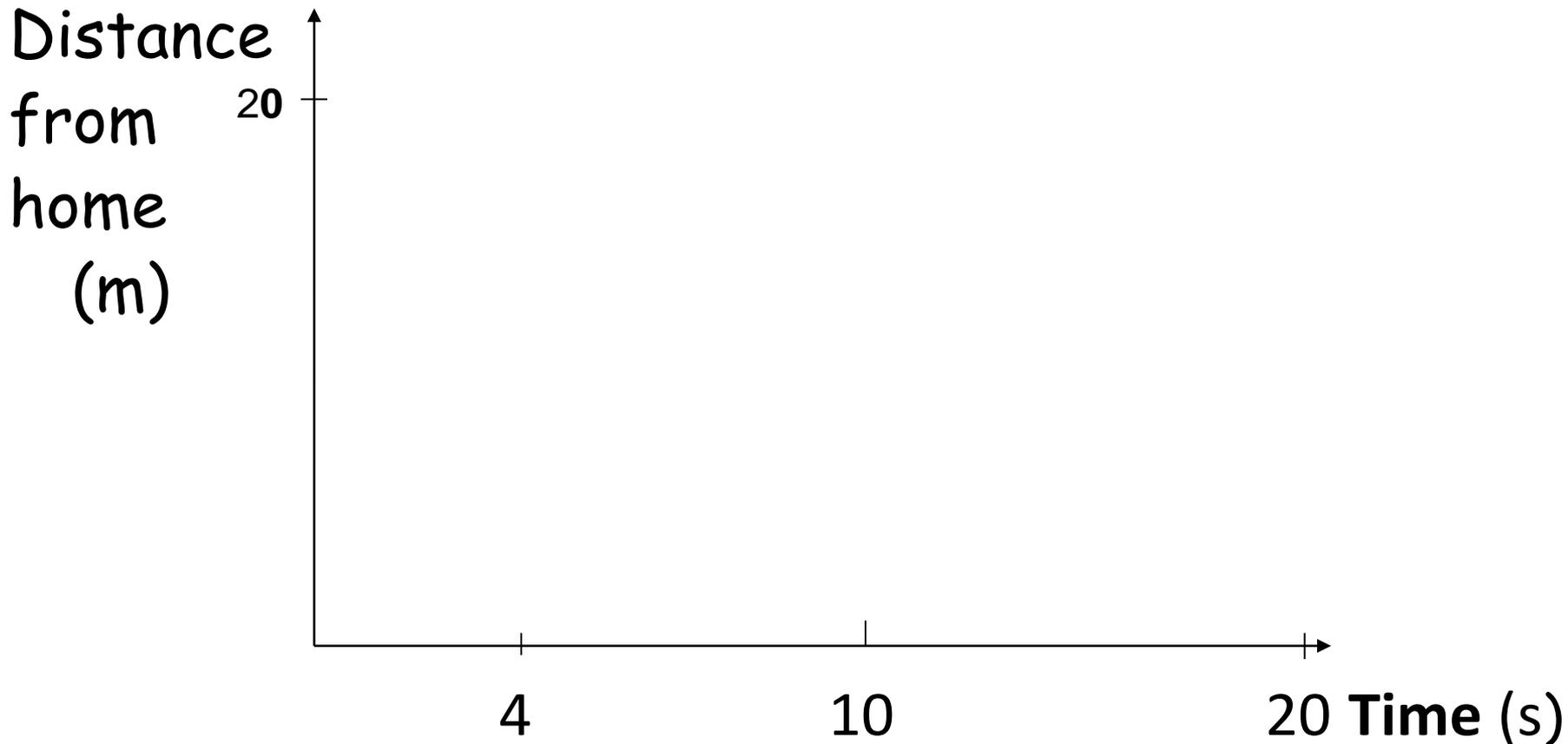


2. The Porsche travelled at 40 m/s for 2 minutes. How far did it go in metres ?

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

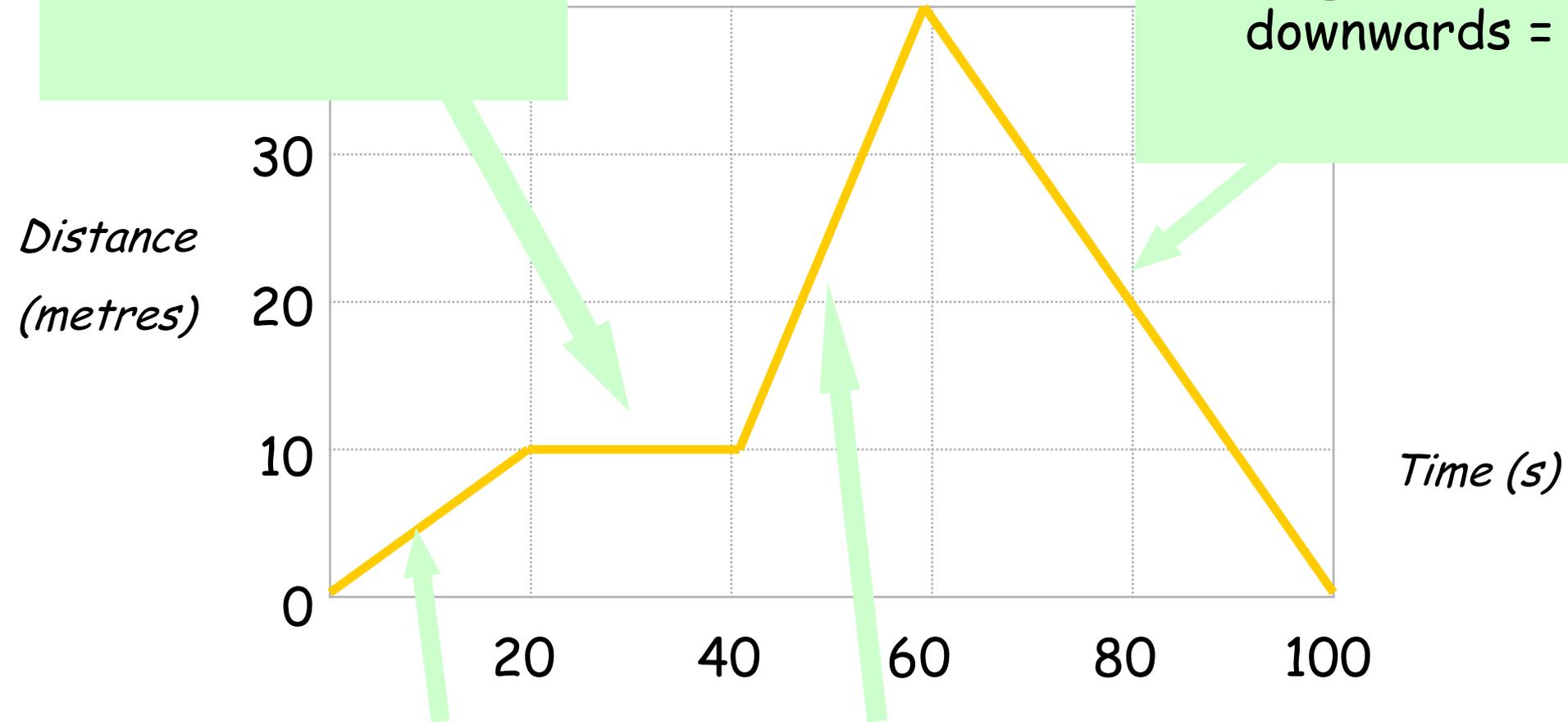
Have a go - Sketch the motion

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 =

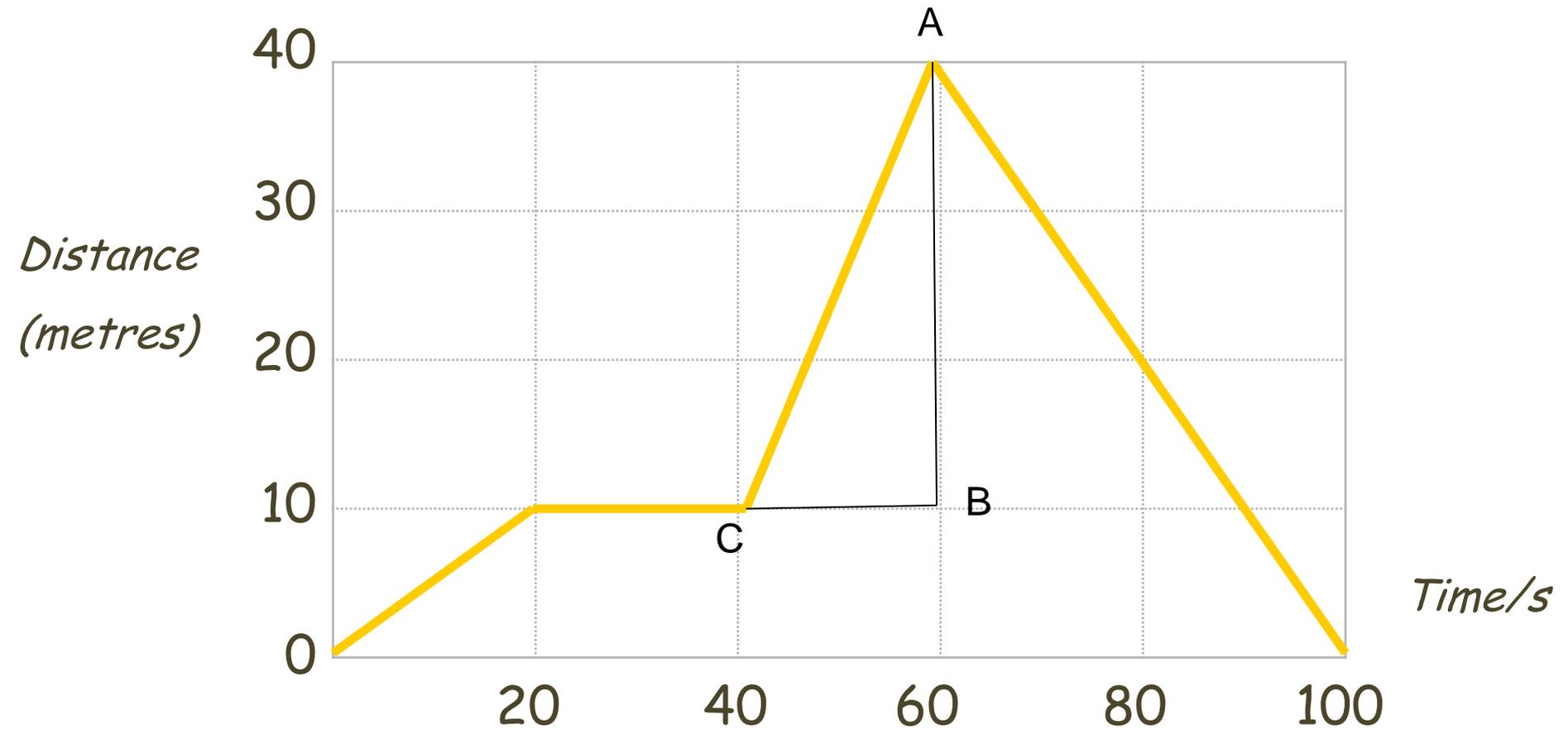
4) Diagonal line downwards =

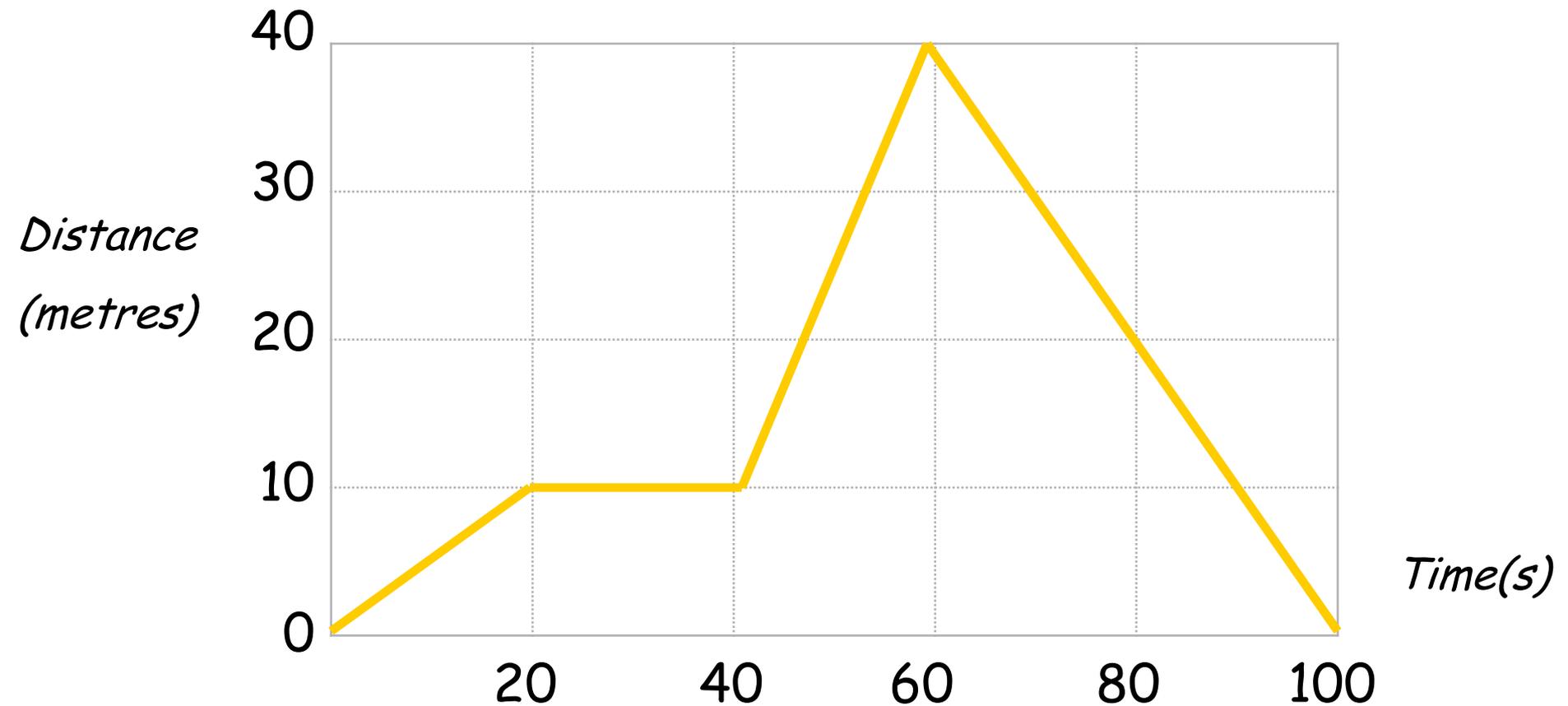


1) Diagonal line =

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?

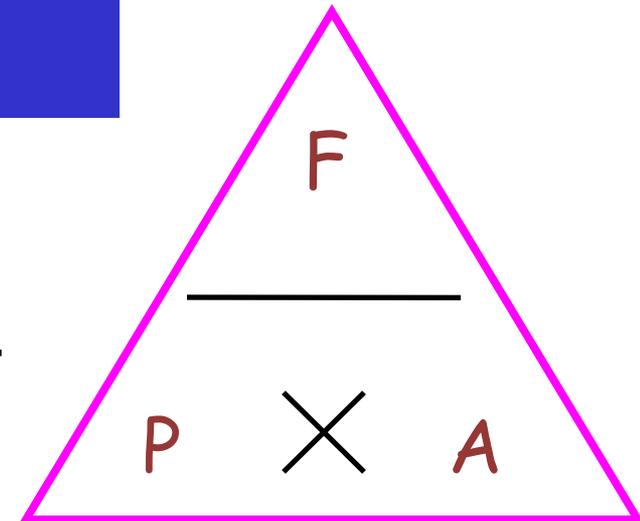
Pressure

The unit of pressure is: newtons per square centimetre (N/cm²)

The unit of force is: The newton (N)

The unit of area is: Square centimetre (cm²)

$$\text{Pressure (N/cm}^2\text{)} = \frac{\text{force (N)}}{\text{area (cm}^2\text{)}}$$



Take a look at the exercises on the
Letts DVD

Now.....

1. Fill in your speed, distance time sheets
2. Go to page 34 of the red PHYSICS (Lewis and Foxcroft) books. Answer Q1-9.

– Remember to set out all your working neatly

– Don't forget units

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