Year 8 Phys: Forces and motion

Keywords/ Definitions	
Keyword	Meaning
Speed	a measure of how fast an object is moving.
Motion	The state in which one object's distance from another is changing.
Average speed	The overall rate of speed at which an object moves; calculated by dividing the total distance an object travels by the total time
Force	A push or a pull exerted on an object
Balanced forces	Equal force acting on an object in opposite directions
Work done	When a force causes an object to move through a distance work is done. Unit is Joule (J). One Joule of work is done when a force of 1 Newton causes a displacement of 1m
Lever	A simple machine consisting of a pivot, effort and load. Reduces the amount of force needed to move a load
Load	The overall force that is exerted, usually by a mass or object, on a surface.
Moment	A turning effect of a force.
Pivot	A point around which something can rotate or turn.
Effort	Force used to move a load over a distance

Key Facts

- To work out an object's speed you need to know the distance it has travelled and the time taken.
- Speed cameras are used to find out if a motorist is travelling faster than the speed limit for the road.
- The camera takes two photos of the vehicle. The two photos can be taken:

at a certain time apart so the distance travelled in that time can be measured
Or a certain distance apart so the time taken can be measured.
The computer connected to the speed camera can then divide the value of 'distance travelled' by the value of 'time taken' to calculate the speed of the car.

- A journey describes the motion of an object over time.
- A journey can be represented using a distance-time graph.
- The graph will show when an object is moving and when it is stationary.
- The graph can also be used to calculate how fast the object is travelling.

Numeracy

Calculating speed:
Speed = distance/time
Distance = speed x time
Time = distance/speed

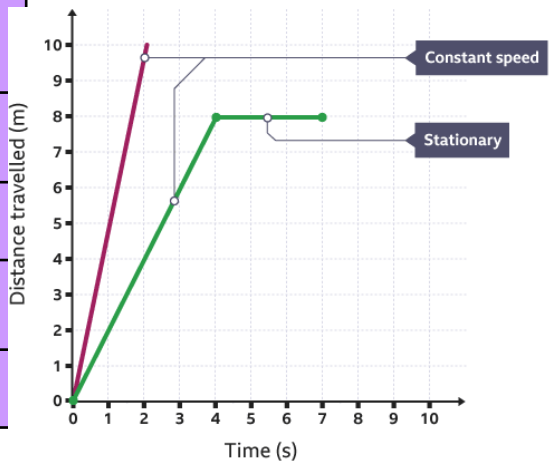
The most commonly used unit for speed in Physics is metres per second (m/s).
You can convert kilometres into metres by multiplying it by 1000.

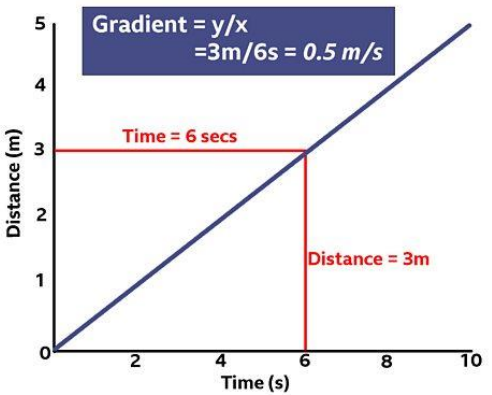
Relative motion:
Same direction:
Relative speed = fastest speed – slowest speed

Opposite directions:
Relative speed = speed of object 1 + speed of object 2

The gradient of the line on a distance-time graph is equal to the speed:
Gradient = change in y value/change in x value

Work done = force x distance





This means that finding the gradient is the same as using the formula:

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$