Science Department

KNOWLEDGE & VOCABULARY ORGANISER

Physics - Motion and Forces

Keyword	Definition
Attraction	When objects are pulled towards each other.
Charge	Positive or negative, generated by rubbing together two objects.
Compass	Detects magnetic fields. Can be used to plot a field or navigate.
Electric Field	Area around an electric charge which can affect other object
Gravity	The universal attraction between objects.
Mass	Amount of matter something contains, kilograms.
Newton	Unit of force.
Weight	Force caused by the effect of gravity on a mass, newton.
Pole	End of a magnet
Orbit	The path of an object around a star, planet or moon.

Further Reading:

https://www.bbc.co.uk/bitesize/guides/zttfyrd/revision/9

https://www.youtube.com/watch?v=511rdc8K_TU

https://www.animatedscience.co.uk/ks3-forces-and-pressure

Speed

The speed of an object tells you how fast or slow it is moving. You can find the average speed of an object if you know the distance it has travelled, and the time taken to travel that distance.

$$\text{speed} = \frac{\text{distance}}{\text{time}}$$

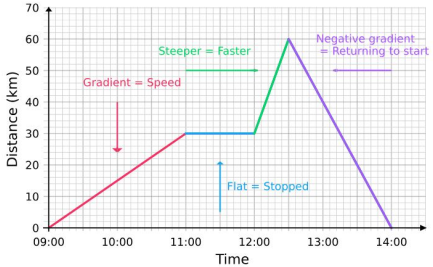
distance: m

time: s

speed: m/s

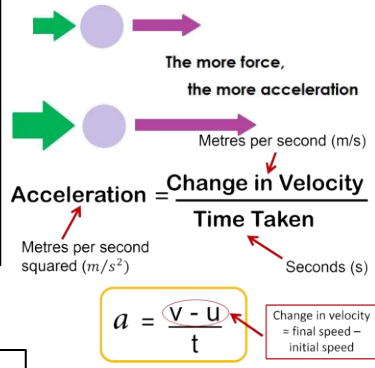
Distance/Time graphs

If an object moves along a straight line, the distance travelled can be represented by a distance-time graph. In a distance-time graph, the gradient of the line is equal to the speed of the object. The greater the gradient (and the steeper the line) the faster the object is moving.



Acceleration

How quickly the speed of an object increases or decreases. The greater the change of speed or the smaller the time taken for the change to take place, the larger the acceleration of the object.

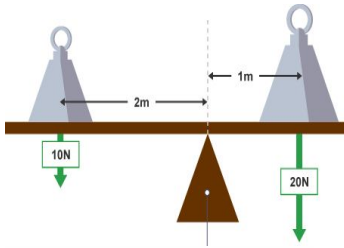


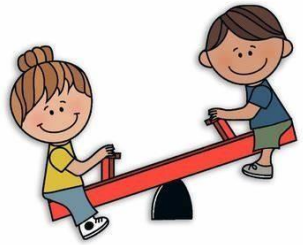
Moments

A moment is a turning effect of a force. Forces can make objects turn if there is a pivot. To calculate moments, you need two things:

The distance from the **pivot** that the force is applied, and the size of the force applied.

moment (Nm) = force (N) x distance (m)





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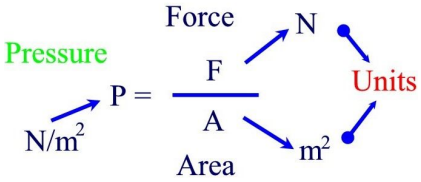
Pressure

Pressure is a measure of how concentrated (or spread out) a force is.The amount of pressure exerted on an object depends on the force applied and the surface area it is spread over.We can calculate the amount of pressure on an object using a simple formula:



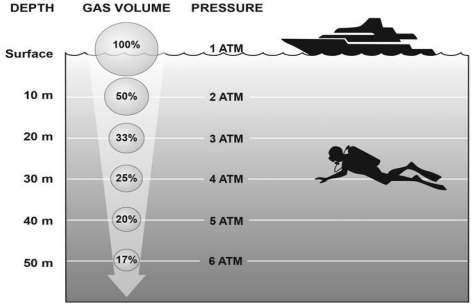
Pressure at Depth

The amount of pressure exerted depends on both the density of the liquid and the depth of the liquid. The deeper you go: the greater the weight of liquid above the object. the greater the liquid pressure.The Mariana Trench in the western Pacific is the deepest part of the ocean and is nearly 11 km below sea level. The pressure at that depth is estimated to be around 1.1 × 10^8 Pa (110,000,000 Pa).

Atmospheric Pressure

Earth's atmosphere is a mixture of gases, mainly nitrogen and oxygen. These particles are constantly colliding with us at a pressure of 100,000 Pascals at sea level. These particles are attracted to earth's gravity, so you get less

the higher up you go.



Pressure and buoyancy

An object in a liquid experiences a force called **upthrust**. This is due to the particles in the liquid colliding with the surface of the object, which exerts pressure.An object placed in a liquid will begin to sink. As it sinks, the liquid pressure on it increases and so the upthrust increases.For a floating object, the upthrust is equal and opposite to the object's weight. An object will continue to sink if its weight is greater than the maximum upthrust.