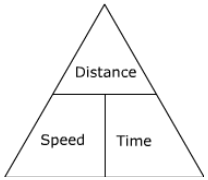
Knowledge Organiser – Forces

Speed (m/s) = Distance travelled (metres) / Time (seconds)

So if a student runs 10 metres in 2 seconds he is running at a speed of 10÷2 = 5m/s



How can you calculate relative speed?

Situation	Relative speed
2 cars moving in the same direction	Fastest speed – slowest speed
2 cars moving in opposite directions towards, or away from, each other	Add the two speeds together

A **moment** is a turning force, measured in newton metres (Nm):
Moment = force x distance from the pivot

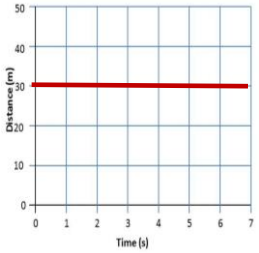
Pressure is how much force is applied to a certain area and is measured in **pascals (Pa)** or newtons per square metre (N/m^2)

Pressure = force / area

Pressure increases with depth of a liquid.

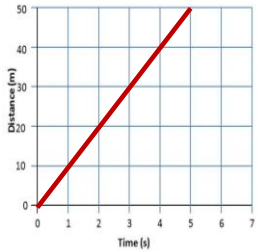
Objects **float** if they displace a greater weight of water than their weight.

Distance time graphs 1:



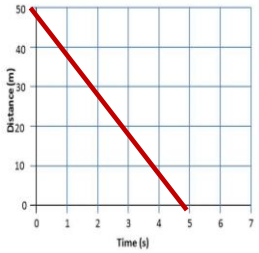
This object is staying still. It is 30m away from the starting point.

Distance time graphs 2:



This object is moving at a constant speed of 10m/s.

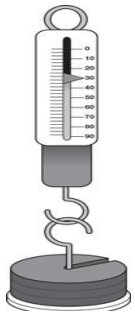
Distance time graphs 3:



This object is returning to the starting point.

Forces are measured in Newtons (N)

You can measure forces using a Newton meter:



Instantaneous speed is the speed of something at that moment in time
Average speed is total distance travelled divided by total time taken

Forces can change the direction, speed or shape of an object.

There are 2 types of forces:

Contact- such as friction, air resistance, reaction, tension and thrust

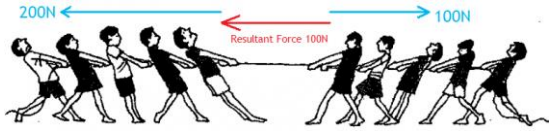
You can't see forces, but you can see the effects of them.

When you draw diagrams, add arrows to show where forces are acting.

Force arrows show the direction *and* size of the force.

Forces act on the object so the arrow must touch the object it is acting on.

Resultant force = bigger force – smaller force



Forces are balanced when they are the same size and acting in the opposite direction. They are said to be in equilibrium.

Weight is a **force** caused by **gravity**. It is measured in **Newtons (N)**. The weight of an object **can change**.

Mass is the **amount of material** in an object. It is measured in **kilograms (kg).** The mass of an object **does not change.**

Weight = mass x gravitational field strength

On Earth, the gravitational field strength = 10N/kg