

Forces knowledge organiser

Keyword	Definition
Friction	The resistance that one surface or object encounters when moving over another
Air resistance	The frictional force air exerts against a moving object
Reaction	A force that acts in the opposite direction
Weight	The force of gravity acting on a mass
Thrust	The force that drives an object
Balanced force	When opposite forces are equal to each other
Unbalanced force	When opposite forces are unequal to each other
Resultant force	The sum total of the forces applied to an object
Hooke's Law	The extension of a spring is proportional to the force applied
Kinetic energy	Energy stored in a moving object
Terminal velocity	The highest velocity attainable by an object as it falls through a fluid.

Forces

A force can be a push or a pull, for example when you open a door you can either push or pull it. You can not see forces, you can only see what they do.

When a force is applied to an object it can lead to a change in the objects;

- Speed
- Direction of movement
- Shape

Forces can also be divided into 2 types, contact and non contact forces.

1. Contact forces – e.g Friction,
2. Non contact forces – e.g Gravity

Unbalanced Forces

If more than one force act along a straight line, the resultant force can be found by adding (acting in the same direction) or subtracting (acting in opposite direction) them.

$$100 - 60 = 40 \text{ N (to the right)}$$



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.

The equation is:

$$\text{Speed(m/s)} = \text{Distance(m)} \div \text{Time(s)}$$

$$V = \frac{S}{t}$$

E.g. A car travels 100m in 20s. Calculate the speed of the car.

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

$$\text{Speed} = 100\text{m} \div 20\text{s}$$

$$\text{Speed} = 5\text{m/s}$$

Contact & Non-Contact Forces

All forces between objects are either:

Contact Forces – The objects are physically touching

Non-Contact Forces – The objects are physically separated.

Contact: Friction, Air Resistance, Tension, Normal Contact

Non-Contact: Gravitational, Electrostatic, Magnetic