

Forces

A force is a PUSH or a PULL in a particular direction. It can also be a TWIST. Forces are measured in NEWTONS.

KEY SCIENCE

Forces Affect How Things Move

They can make objects:-

- Start moving
- Move faster
- Move slower
- Stop moving
- Change direction
- Change shape.

Since forces cause changes in speed or direction we can say that *forces cause acceleration.*

Types of Force

THRUST- This is a driving force. It can be a push or pull or an engine driving an object forward.

LIFT-The force needed to lift an object through a fluid or gas.

AIR RESISTANCE- This acts in the air. It can slow objects down if moving against it, or if harnessed can be used to move an object along.

FRICTION- This is a force that can be reduced by making sure both objects are smooth.

GRAVITY-This acts on every object on Earth and pulls it towards the Earth's centre.

UPTHRUST- This is an upwards force acting in water. It acts on an object against gravity and is why certain objects float.

Other forces can't be seen but form fields- like magnetism or electro mahnestism.

RESULTANT FORCES

We use arrows to represent forces acting on an object.

These can add together or cancel each other out.

The leftover force is then called the RESULTANT FORCE.

Forces that act in the same direction can be added together.

Forces that act opposite to each other can be taken away.

Forces that act vertically and horizontally CANNOT be added and taken away from each other and MUST be considered separately.

Example



The resultant force is 3N to the left.

You must state the direction in which the force is acting. The arrows should represent the size of the force.

KEY POINTS

Elastic limit- when stretching a spring this is the point at which the spring will no longer return to its original shape. Also known as limit of proportionality.

Directly proportional- As one variable increases the other also increases and will give a straight line if drawn on a graph.

Force- A push, pull or twist on an object, measured in NEWTONS (N).

SPRINGS AND HOOKES LAW

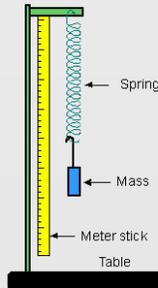
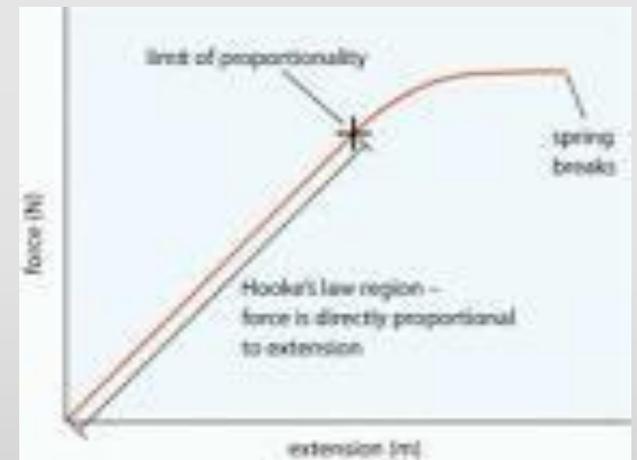


Figure 7.2 - Simple harmonic oscillation.

A spring will stretch when mass is added to it . The amount it stretches is directly proportional to the mass added UNTIL it reaches its elastic limit, after which point it will not spring back to its original shape and may break. This is known as HOOKES LAW.

The graph you would see if you were to do an experiment



NEWTON METER



We can measure forces by using a **Newton Meter**. These come in different sizes to enable us to measure different magnitudes of force.