

## Forces

Forces are pushes, pulls, or twists.

Forces can:

- cause an object to start moving or change its speed
- change the direction an object is moving
- change the shape of an object.

## Friction

Friction is the force that acts when two objects rub against each other.

Friction:

- produces heat
- always slows objects down
- is sometimes useful but at other times it is not useful.

## Gravity...

- is the pull of objects towards Earth. This is also called weight and measured in Newtons (N).
- was first described by Isaac Newton.
- keeps planets in orbit around the Sun.



## Air resistance

Air resistance is a type of friction that slows down objects moving through air.

Friction always acts in the opposite direction to the way you are moving.

If you are moving downwards, then the friction (air resistance) acts upwards.



## Water resistance

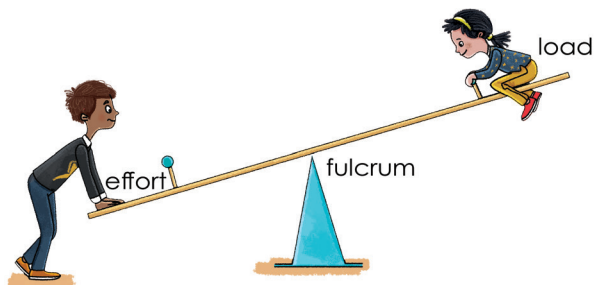
Water resistance is a type of friction that slows down objects moving through water.

Streamlining reduces the effects of water resistance.

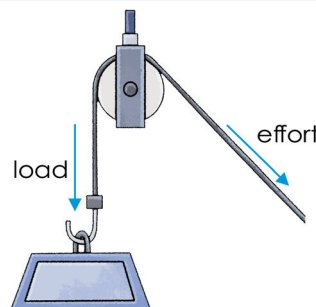
## Simple machines

### Lever

Levers make a small force bigger.

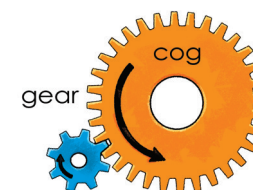


### Pulleys



Pulleys can change the direction of a force.

### Gears



Machines can make a force bigger.

Machines can change the direction of a force.

Cogs can turn to change the direction of a force.

Word	Definition
air resistance	Friction that acts on objects moving through air.
cogs	Toothed wheels that can lock with each other.
effort	The force you apply to change the position of a load.
force	What changes the direction, speed or shape of an object.
friction	The force that slows down movement when two objects are touching.
fulcrum	In a lever, it is the point where the beam rests or pivots (turns).
gear	Cogs that lock together and turn, changing the force.
gravity	A force that pulls objects towards each other.
lever	A machine with a beam that rests on a fixed point (fulcrum): it is designed to make a small force bigger.
load	The object that is being lifted.
mass	The amount of 'stuff' something is made up of: it is measured in grams (g) or kilograms (kg).
newton meter	Equipment used to measure the forces acting on an object.
newtons	The unit of force.
pull	A force that moves an object towards something else.
pulley	A machine with a wheel and rope that changes the direction of a force making it easier to exert.
push	A force that moves an object away from something else.
streamlined	A shape designed to reduce air or water resistance.
twist	A force that turns an object.
water resistance	Friction that acts on objects moving through water.
weight	The force of Earth (gravity) acting on an object due to its mass: it is measured in newtons (N).