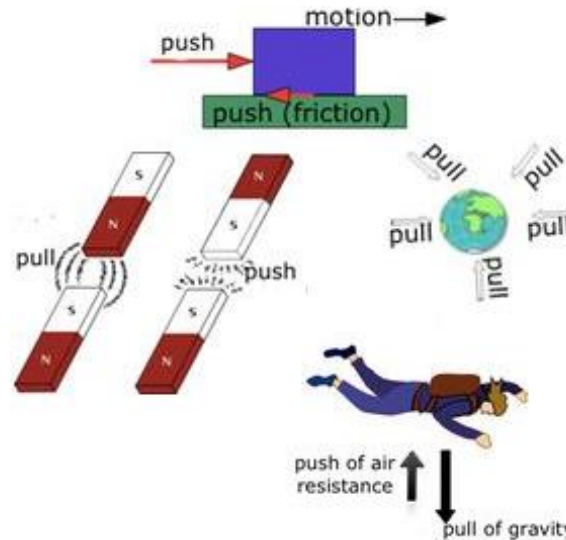


# Years 5 and 6 Knowledge Organiser - Forces

Key vocabulary	
forces	Pushes or pulls
gravity	A pulling force exerted by Earth or anything else that has mass.
Earth's gravitational pull	The force that Earth exerts on an object when it pulls it towards Earth's centre. Earth's gravitational pull is what keeps us on the ground.
weight	The measure of the force of gravity on an object
mass	A measure of how much matter (or stuff) is inside an object

## Forces can make an object:

- start to move
- stop moving
- move faster
- move more slowly
- change shape
- change its direction



Isaac Newton is famously thought to have developed his theory of gravity when he saw an apple fall to the ground from an apple tree.



The Moon has a smaller mass than Earth so the gravitational pull on the Moon is smaller than it is on Earth.



Jupiter has a greater mass than Earth so the gravitational pull on Jupiter is stronger than on Earth.

**Mass** is how much matter is inside an object. It is measured in kilograms (kg).

**Weight** is how strongly gravity is pulling an object down. It is measured in newtons (N).

## Mass and Weight

Location	Mass (kg)	Weight (N)
Earth	10 kg	98 N
Moon	10 kg	1.6 N
Space	10 kg	0 N

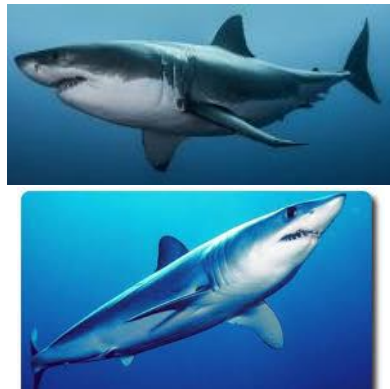
The diagram shows a 10 kg block on a scale in three different environments:
 

- Earth:** The scale shows 10.00 kg. The weight is 98 N.
- Moon:** The scale shows 10.00 kg. The weight is 1.6 N.
- Space:** The scale shows 10.00 kg. The weight is 0 N.

## Key vocabulary

<b>friction</b>	A <b>force</b> that acts between two surfaces or objects that are moving, or trying to move, across each other
<b>air resistance</b>	A type of <b>friction</b> caused by air pushing against any moving object
<b>water resistance</b>	A type of <b>friction</b> caused by water pushing against any moving object
<b>buoyancy</b>	An upward <b>force</b> that a liquid applies to objects
<b>streamlined</b>	When an object is shaped to minimise the effects of <b>air or water resistance</b>
<b>mechanism</b>	Parts which work together in a <b>machine</b> . Examples of mechanisms are <b>pulleys, gears and levers</b> .

This shark is **streamlined**. It has a pointed nose to cut through the water, and a smooth, low, curved back to allow the water to flow over and around it. It does not create much **water resistance** so it can move through the water quickly.

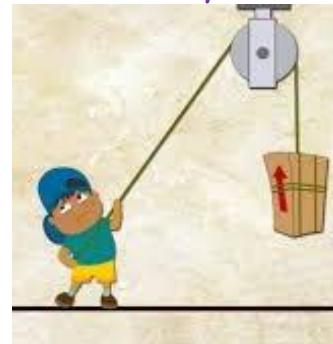


## Examples of forces in action:

**Water resistance** and **air resistance** are forms of friction. Friction is sometimes helpful and sometimes unhelpful. For example, **air resistance** is helpful as it stops the skydiver hitting the ground at high speed. **Friction** on a bike chain can make the bike harder to pedal so it is unhelpful.



### Pulleys



Pulleys can be used to make a small **force** lift a heavier load. The more wheels in a pulley, the less **force** is needed to lift a **weight**.

### Gears/Cogs



Gears or cogs can be used to change the speed, **force** or direction of a motion. When two gears are connected, they always turn in the opposite direction to each other.

### Lever



Lever can be used to make a small **force** lift a heavier load. A lever always rests on a pivot.