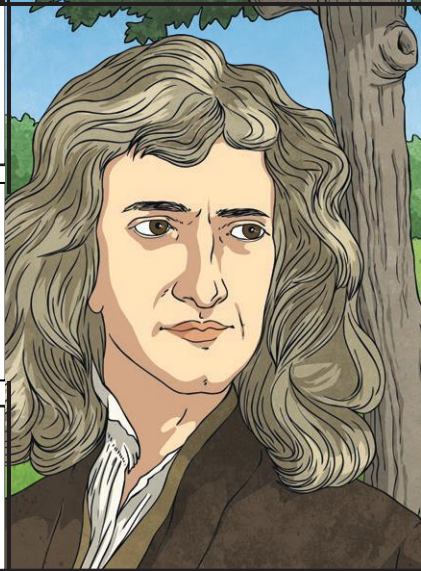
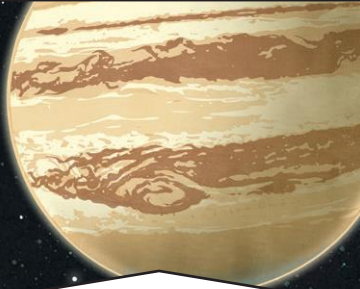


Key Vocabulary	
<b>forces</b>	Pushes or pulls.
<b>gravity</b>	A pulling <b>force</b> exerted by the Earth (or anything else which has <b>mass</b> ).
<b>Earth's gravitational pull</b>	The pull that Earth exerts on an object, pulling it towards Earth's centre. It is the Earth's <b>gravitational pull</b>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

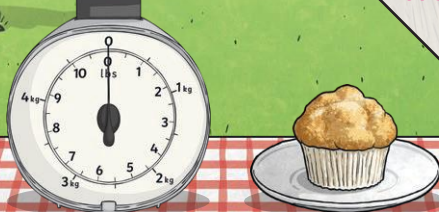
Key Knowledge		Isaac Newton
<p><b>Forces</b></p> <p>start to move.</p> <p>stop moving.</p> <p>change direction.</p> <p><b>Forces can make an object...</b></p> <p>move faster.</p> <p>change its shape.</p> <p>move more slowly.</p>		

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).



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.

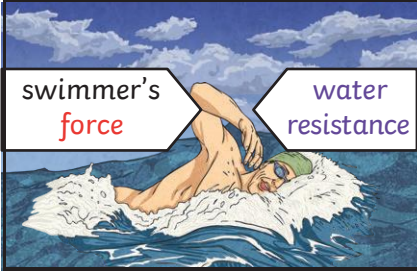


When an object is not moving, are there any forces acting on it?  
 What sort of force is gravity?  
 What is the name of the force created when two surfaces rub together?


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 object is buoyant if it floats. This is because the weight of the object is equal to the <b>upthrust</b> .
<b>streamlined</b>	When an object is shaped to minimise the effects of <b>air</b> or <b>water resistance</b> .
<b>mechanism</b>	<b>Mechanisms</b> are simple machines with moving parts that change input forces and movement into a set of useful output forces. Examples of <b>mechanisms</b> are pulleys, gears and levers.
<b>upthrust</b>	A <b>force</b> that pushes objects up, usually in water.

### Key Knowledge


Examples of **forces** in action:



swimmer's **force**      **water resistance**



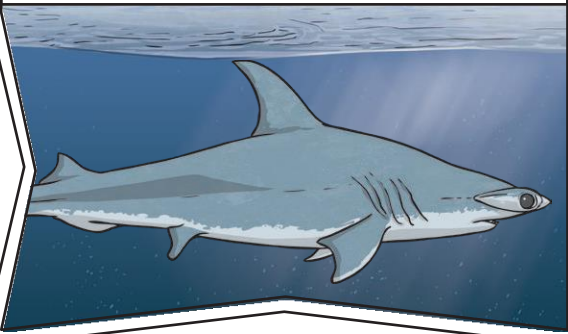
**gravity**  
**air resistance**



cyclist's **driving force**      **friction**


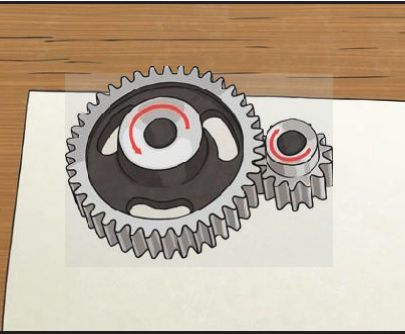

**Water resistance** and **air resistance** are forms of **friction**. **Friction** is sometimes helpful and sometimes unhelpful. For example, **air resistance** is helpful as it stops the skydiver hitting the ground at high speed. **Friction** on a bike chain can make the bike harder to pedal so it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

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.

Pulleys	Gears/Cogs	Levers
		
<p>Pulleys can be used to make a small <b>force</b> lift a heavier load. The more wheels in a pulley, the less <b>force</b> is needed to lift a <b>weight</b>.</p>	<p>Gears or cogs can be used to change the speed, <b>force</b> or direction of a motion. When two gears are connected, they always turn in the opposite direction to each other.</p>	<p>Levers can be used to make a small <b>force</b> lift a heavier load. A lever always rests on a pivot.</p>