

Key Vocabulary	
force	Pushes or pulls that can affect an object's movement, speed, direction or shape.
friction	A force between two touching objects that are trying to move or already moving across each other.
air/water resistance	When there is friction between an object and what it is moving through. This could be air resistance or water resistance .
motion	The movement of an object in a particular direction.
streamlined	Streamlined objects are shaped to create less air or water resistance .

Streamlining

Streamlining is the process of shaping an object to reduce the amount of **air** or **water resistance** acting upon it. This can include cyclists wearing tight clothes and pointed helmets to reduce the amount of **air resistance** or swimmers stretching their arms out to a point to reduce **water resistance**. They can then move faster.

In nature, sea creatures and birds are often **streamlined** to help them move more easily through the air or water.

Force	Useful Applications	Non-useful Applications
friction	Brake pads slowing the movement of bicycle tyres.	Getting a static shock when walking with socks on a carpet.
air resistance	Slowing skydivers down when deploying parachutes to land.	Slowing cyclists by pushing against their movement.
water resistance	Using water to slow down a diver's speed at the end of a dive.	Working harder to swim against a current.
gravity	Being able to cycle downhill without pedalling.	Something breaking when dropped on the floor.

Opposing Forces

Sometimes, an object has opposite **forces** acting on it at the same time. The balance of these **forces** dictates what happens.

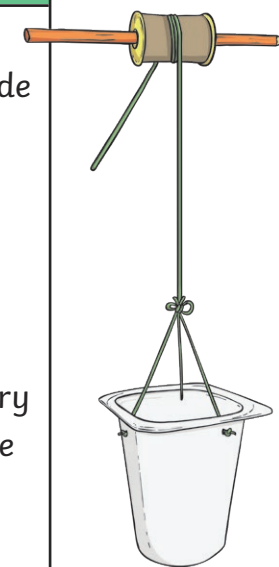
When a cyclist is riding, they experience **air resistance**. This works in the opposite direction to the **motion** of pedalling, meaning the **air resistance** slows them down. Wearing a **streamlined** helmet reduces **air resistance**. This means that they can use the same push **force** but move faster or more easily.

Key Vocabulary	
gravity	A pulling force exerted by anything with mass .
mass	The measure of how much matter an object is made up of.
weight	The measure of how much gravity is acting upon an object.
gravitational pull	The pull force that a mass , such as the Earth, exerts on objects to pull them towards its centre.
surface area	This is the total area an object's surface covers.

Weight vs Mass

The **mass** of an object can be measured in kilograms and tells us how much matter it is made up of. This is fixed and will not change based on location.

Weight is a measure of how strongly **gravity** is pulling an object down. **Gravity** is measured in newtons. Because **weight** is dependent on the **gravitational pull** acting on an object, it may vary depending on location. An astronaut will have the same **mass** but a lower **weight** on the Moon, due to the Moon's weaker **gravitational pull**.



	Purpose	Examples
lever	A lever is made up of a bar and a pivot. It helps a small force to move a heavier load.	A wheelbarrow is an effective lever. The wheel is the pivot and allows the user to lift the handles and move a much heavier load.
pulley	A pulley uses a rope loaded over wheel/s to make lifting heavy objects easier.	Lifts use pulleys to transport heavy loads up and down. Other examples of pulleys include cranes and blind cords.
gear	Gears feature in moving objects as they allow lower smaller cogs to power larger cogs which can then power larger movements.	When cycling, you might choose a lower gear when riding uphill. Other examples include wind-up toys, car transmissions and some analogue clocks.
machine	A machine is a piece of equipment that does a specific job.	Levers, gears and pulleys are machines that power much larger machines such as vehicles and household appliances.