

### Knowledge Organiser

Year Group	Subject	Topic
5	Science	Forces

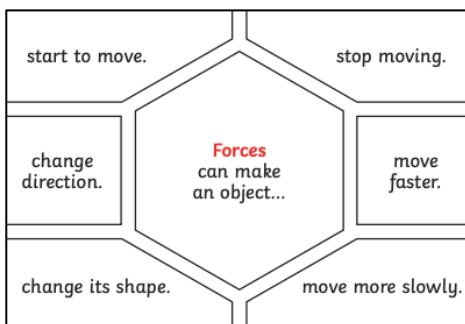

#### The Big Picture

The children will begin by recapping their prior knowledge of friction, they should understand that friction always works in the opposite direction to that in which the object is moving. They will conduct investigations and evaluate the results to explore various forces including friction, air resistance, water resistance and gravity. When recording accurate results, children will utilise their knowledge of time including decimals and D&T skills to develop and test mini parachutes. Throughout the topic children will be shown a wide range of real life examples to understand how forces are useful in everyday life, including examples such as brakes on bicycles, air resistance on aeroplanes and the effects of water resistance on sharks.

#### Enquiry Question

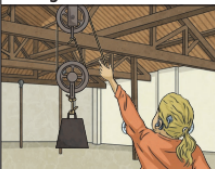


How is friction caused and how can it help us?  
Which shape will have the most water resistance?  
Why?  
Why is gravity described as a non-contact force?

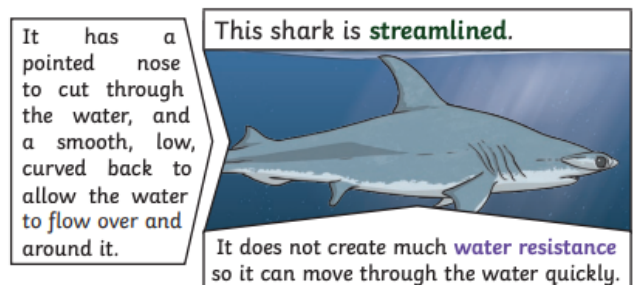
What does air resistance do to moving objects?  
How does the surface area of the parachute affect the amount of air resistance?  
Where can you find examples of levers, pulleys and gears in everyday life?

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.

Pulleys	Gears/Cogs	Levers
		
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> .	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.	Levers can be used to make a small <b>force</b> lift a heavier load. A lever always rests on a pivot.



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.

This shark is **streamlined**.  
It does not create much **water resistance** so it can move through the water quickly.

<b>Force</b>	Pushes and pulls in a certain direction. A force can change the speed or shape of an object.
<b>Friction</b>	The contact force between two surfaces that are touching each other.
<b>Motion</b>	The process of an object moving in a certain direction.
<b>Contact force</b>	A force between two objects that are touching each other.
<b>Non-contact force</b>	A force that does not require physical contact between two objects.
<b>Air resistance / drag</b>	A type of friction between air and another object.
<b>Water resistance</b>	A type of force cause by friction slowing things down that are moving through a liquid.
<b>Streamline</b>	Having a shape that has little resistance to a flow of air or water.
<b>Anomalous result</b>	A result that does not fit the pattern.
<b>Gravity</b>	An invisible force that pulls things to the centre of the Earth (or other planets).