

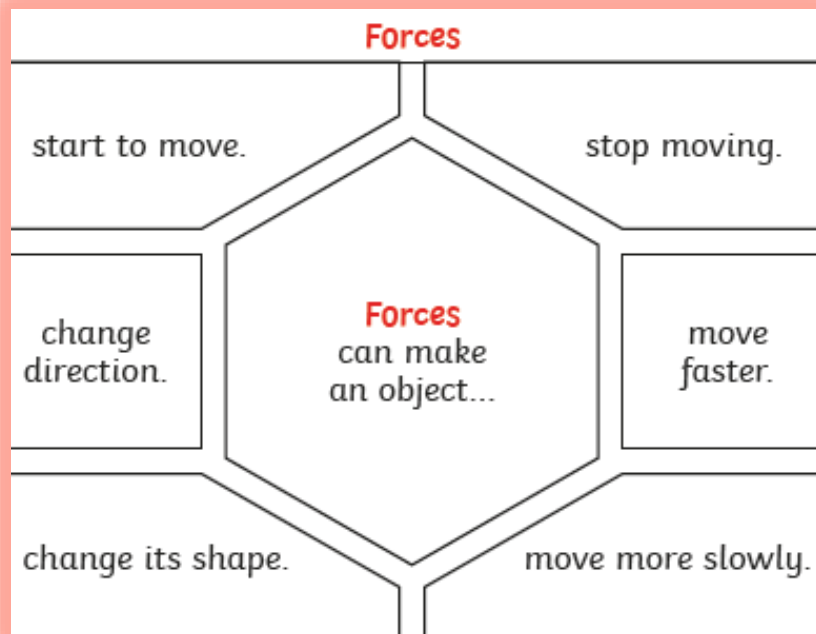
Year 5 Knowledge Organiser- Can you feel the force?



What will I learn?

In this topic we will learn to:

- Understand why unsupported objects fall towards the Earth.
- Recognise different types of **forces** such as **air resistance**, **water resistance** and **friction** and how they act on objects and understand the benefits and disadvantages to those forces.
- Design and use simple mechanisms including a pulley to lift and move loads with less effort making work easier for us.



Previous learning	You should already know:
Y3 What do you know about forces?	• how things move on different surfaces • that some forces need contact between 2 objects, but magnetic forces can act at a distance

Vocabulary Dozen

air resistance	A type of friction caused by air pushing against any moving object.
force	A force is a push or pull on an object.
friction	A force that acts between two surfaces or objects that are moving, or trying to move, across each other.
gears	Gears are mechanical parts with cut teeth designed to fit with teeth on another part so as to transmit or receive force and motion.
gravity	A pulling force exerted by the Earth (or anything else which has mass).
lever	The lever is one of the most basic forms of a machine. Levers help us lift loads with lesser effort. A lever can be described as a long rigid body with a fulcrum along its length.
mass	The amount of matter (stuff) that makes an object. The mass of an object doesn't change even in space
mechanism	Parts which work together in a machine. Examples of mechanisms are pulleys, gears and levers.
pulley	A pulley is a wheel on a fixed axle, with a groove along the edges to guide a rope or cable. Pulleys are used to reduce the time and energy taken to lift heavy objects.
surface area	A measurement of all the space that the surface of an object takes up.
water resistance	A type of friction caused by water pushing against any moving object.
weight	The measure of the force of gravity on an object. E.g A sack that weighs 5kg on earth would be weightless in outer space

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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	Gears/Cogs	Levers
Pulleys can be used to make a small force lift a heavier load	Gears or cogs can be used to change the speed, force or direction of a motion.	Levers can be used to make a small force lift a heavier load. A lever always rests on a pivot.

Key Knowledge

What makes things fall?

- Objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. It is the Earth's gravitational pull that keep us on the ground.
- Gravity pulls objects towards the centre of the Earth.
- The Moon has a smaller mass than Earth so the gravitational pull on the Moon is smaller than it is on Earth.

How do we slow down falling objects?

- As an object moves through the air it will experience air resistance. The air resistance an object experiences is down to its surface area and not its weight. In a vacuum (where there is no air) a bowling ball and a feather would fall at the same rate.

Does the shape of an object affect its movement in a liquid?

- As an object moves through the water it will experience water resistance. The water resistance an object experiences is down to its shape. The bow of a ship will experience less water resistance if it is narrow and pointed.

What stops things moving?

- Friction stops things from moving. Friction has some benefits and disadvantages.
- Water resistance and Air resistance are types of friction.

What are levers, pulleys and gears and how do they help us?

- levers, pulleys and gears, allow a smaller force to have a greater effect. This means they are extremely helpful to use when we want to move heavy objects from one place to another.