

# Year 5 Summer Term Science Knowledge Organiser

**KEY QUESTION: What are forces and how do they affect our everyday life?**

A force is a push or a pull acting on an object. Forces change the motion of an object. They will either make it start to move, speed up, slow it down or even make it stop.

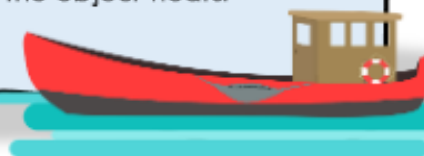
## Friction

When objects are pushed or pulled, an opposing force can be felt. This opposite force is called 'friction'. Friction causes things to slow down or stop. The grip on our shoes stops us slipping. Therefore, friction is great. An ice-skate on an ice-rink will move for a long time because there is very little friction. The rougher the surfaces, the greater the friction. This rubbing of two surfaces can release energy, causing heat. (Try rubbing your hands together!)



## Water Resistance

Water resistance is a type of *friction* which can slow things down in the water. Water acts upon objects making them harder to pass through. A fish has a *streamlined* body shape to help it swim through water more easily. *Upthrust* is the name of the force which keeps things afloat in water. When gravity is greater than upthrust, the object sinks. When the two are the same, the object floats.



## Forces Vocabulary

Force	accelerate	mechanism	direction
gravity	deaccelerate	lever	speed
friction	streamlined	pulley	shape
Air resistance	buoyancy	balanced	Spring
Water resistance	Float	unbalanced	stretch
Surface effect	sink	gear	Compress
move	Surface area	Push / pull	Newton
	density	change	mass

## Air Resistance

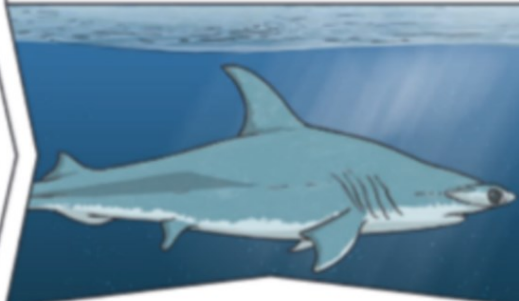


Air resistance (sometimes referred to as drag) acts against gravity on falling or moving objects. It's what you feel on your hair when riding fast on a bike or it's what fills a parachute to help slow you down when falling from the sky. Objects such as aeroplanes reduce air resistance because of their streamlined shape.



## This shark is streamlined.

It has a pointed nose to cut through the water, and a smooth, low, curved back to allow the water around it.



The Shark does not create much water resistance so it can move through the water quickly.

## Gravity

Gravity is a force that holds things to Earth's surface and prevents things from floating off into the atmosphere. It ensures that unsupported objects fall back down to Earth.



It is said that the famous scientist Isaac Newton was sitting under a tree when an apple fell on his head. He identified it was a force pulling the object down. We now measure gravity in Newtons (N) because of this.



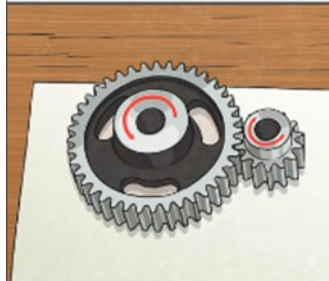
**Newton Metre**  
1kg pulls with a force of 10N



spring

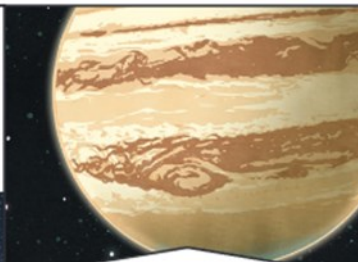
- Springs can be stretched by pulling them or squashed by pushing them. The greater the force pulling or pushing the **spring**, the greater the force the **spring** uses to move back to its normal shape.

## 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.

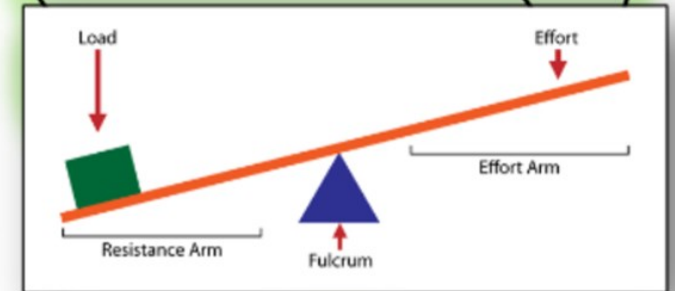
The Moon has a smaller **mass** than Earth so the **gravitational pull** on the Moon is smaller than it is on Earth.



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

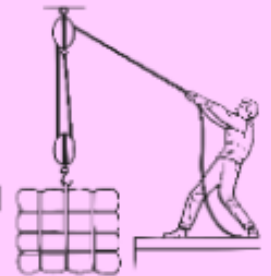
## LEVERS

A way to lift heavy weights using the least amount of effort. The longer the lever, the easier it is to lift. The fulcrum is where the lever pivots in order to lift the heavy load.



## PULLEYS

Used like levers to lift loads with less effort but for longer distances. Rope is passed through a pulley which is attached to an anchor point and returned back to the ground to be pulled.



**Activities to complete at home. Bring in your work over the next 4 weeks so it can be celebrated and shared .**

1. Create a poster to show your understanding of forces. Eg Forces in the playground , Ocean, in the air
2. Make a paper helicopter and investigate how to make it fall faster. Record your findings. (Ask your teacher for a template!!)
3. Make a Pulley, lever or gear system . Take pictures or draw your design and explain how it works
4. Research and create a fact-file about the work of scientist such as Isaac Newton and Galileo Galilei

