

# Manor Primary School Knowledge Organiser –UKS2 Science



Topic: Victorians

Phase: Upper Key Stage 2

Strand: Forces

## What should I already know?

From the LKS2forces topic you should be able to:

- Compare how things move on different surfaces
- Notice that some forces need contact between two objects, but magnetic forces can act at a distance
- Observe how magnets attract or repel each other and attract some materials and not others
- Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials
- Describe magnets as having two poles
- Predict whether two magnets will attract or repel each other, depending on which poles are facing.

## At the end of the unit, I will be able to:

- Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- Identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

## We are MANOR! As Scientists we will...

### Manners

Develop a respect and understanding for the natural world, its people, animals and plants. Share ideas, celebrate good work, value others' contributions, or discussions and debates.

### Aspiration

Learn by being challenged in a series of well-designed scientific enquiry and investigation tasks linked to meaningful contexts and develop a knowledge of scientists and careers to broaden our horizons. Be aspirational in developing scientific knowledge and conceptual understanding through biology, chemistry and physics.

### Nurture

To recognise that we live in a wonderful world made up of many different people and living things. We will develop an appreciation and respect for the diverse world and environment in which we live, showing care and compassion for the environment around us.

### Open-Mindedness

We will be open-minded so that we can conduct experiments or observe what is happening in order to see patterns that might emerge or to gain new knowledge. We will use our curiosity and learn to wonder why something behaves a certain way.

### Resilience

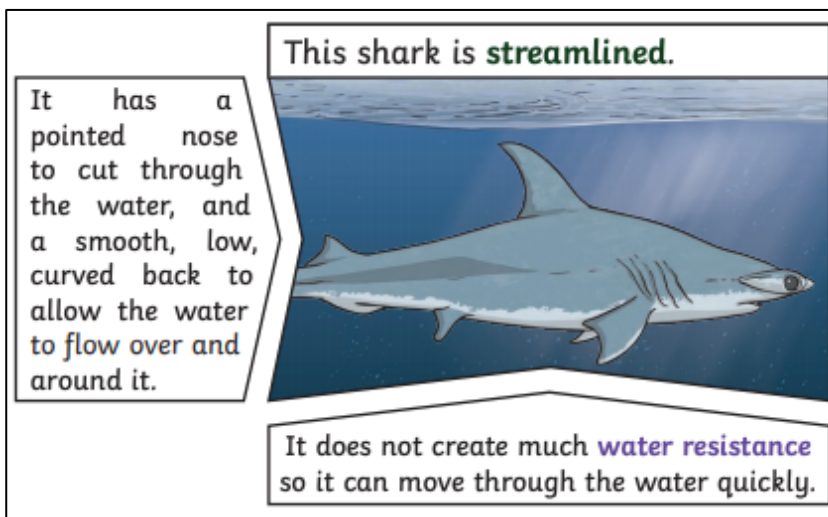
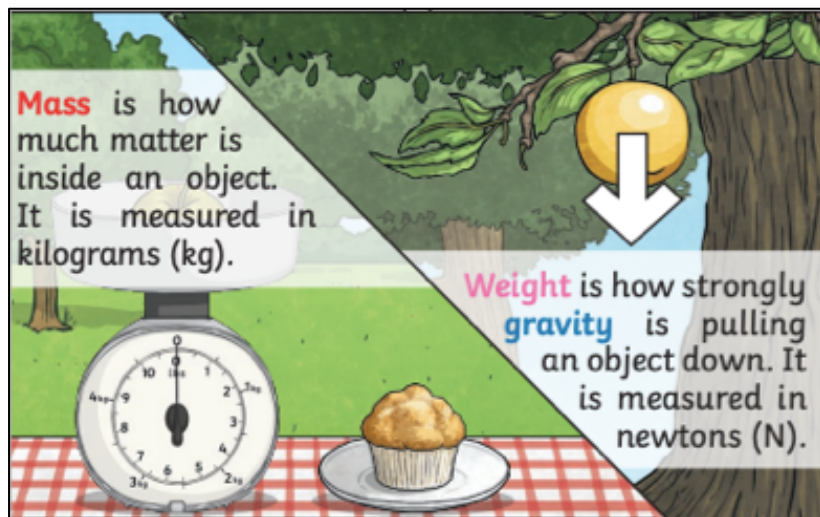
Engage confidently with the science curriculum and learn that anything is possible and failure is not something to fear but to learn from. We will develop our scientific enquiry and investigation skills with patience and care, repeating investigations to check the accuracy of results.

## Sir Isaac Newton

Legend has it Newton formed his theory of gravity after he saw an apple fall from a tree. He also produced the 3 laws of motion. Isaac Newton was a keen mathematician and came up with something called calculus which is the foundation for some of the most complicated mathematical theories. His contributions to science, maths and as a member of parliament Meant that Isaac Newton was knighted and made Sir Isaac Newton in 1705.



# Useful diagrams



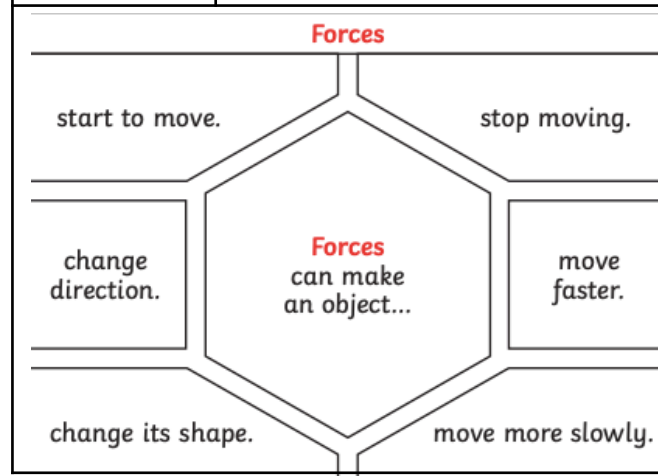
## Examples of **forces** in action:



**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.

## Vocabulary

forces	Pushes or pulls.
gravity	A pulling force exerted by the Earth (or anything else which has mass).
Earth's gravitational pull	The pull that Earth exerts on an object, pulling it towards Earth's centre. It is the Earth's gravitational pull which keeps us on the ground.
weight	The measure of the force of gravity on an object.
mass	A measure of how much matter (or 'stuff') is inside an object.
friction.	A force that acts between two surfaces or objects that are moving, or trying to move, across each other
air resistance	A type of friction caused by air pushing against any moving object
water resistance	A type of friction caused by water pushing against any moving object.
buoyancy	An upward force that a liquid applies to objects.
streamlined	When an object is shaped to minimise the effects of air or water resistance



# Forces Quiz

Use the Knowledge Organiser and research to answer these questions.

Question		Answer
1	How is it said that Newton came to think of his theory behind gravity	
2	What does streamlined mean? Can you think of something that is streamlined?	
3	Name 3 things that forces can make an object do.	
4	Can you give an example of a force in action from the diagrams?	
5	Can you work out the difference between weight and mass?	