



St Julie Catholic Primary School – Science

Topic: Can you feel the force?

Year: 5

Strand: Physics: Forces

What should I already know?

1. A force is a: push, pull, turn twist
2. Objects will move at different speeds on different surfaces
3. Magnetism is a force

Scientist who 'discovered' the concept of gravity when sitting under a tree and an apple fell to the ground near him.

Sir Isaac Newton
(1642 - 1726)

**Key Vocabulary**

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 .
mechanism	Parts which work together in a machine. Examples of mechanisms are pulleys, gears and levers.

By the end of this topic I will:

- **Know** how to identify /describe a balanced or unbalanced force
- **Know** and identify the effects of friction
- **Know/identify/explain** the effects of air resistance
- **Know/identify/explain** the effects of water resistance
- **Know** that pulleys, gears and levers are simple machines
- **Know** that simple machines can make a small force into a bigger force

In experiments I will:

- Identify and use variables
- Repeat measurements for accuracy

Sticky knowledge about:

1. Newton and his discoveries about gravity
2. The links between the mass and weight of objects,
3. Force is measured in Newtons (N)
4. Friction, air /water resistance are slowing down forces
5. A simple machine is a mechanism that helps us to do work.

STICKY KNOWLEDGEExamples 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



Pulleys can make a small force lift a big force. The more wheels on a pulley, the less force is needed to lift a weight.

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.

Levers



Levers can make a small force lift a big force. A lever always rests on a pivot.

Mass is how much matter is inside an object. It is measured in kilograms (kg).



Weight is how strongly **gravity** is pulling an object down. It is measured in newtons (N).





St Julie Catholic Primary School – Science

Topic: Could you be the next Helen Sharman or Tim Peake?

Year: 5

Strand: Physics: Earth and Space

Maggie Aderin-Pocock (born 1968)

Maggie is a British space scientist and science educator. She is working on the observation instruments for the Aeolus satellite, which will measure wind speeds to help the investigation of climate change.

**Nicolaus Copernicus** (1473-1543)

Nicolaus was a Polish astronomer and mathematician who formulated the **heliocentric model** of the solar system that placed the Sun rather than the Earth at the centre of the universe.



Earth	The planet we live on. It is the third planet from the Sun.
Sun	The Sun is the star at the centre of our solar system. It is not safe to look at the sun, even when wearing dark glasses.
Moon	The moon is the only natural satellite of the Earth.
planets	Large round objects, made of rock or gas, that move around the sun.
solar system	The sun and all the planets that orbit around it.
star	A huge ball of glowing gas in space.
rotate	When an object rotates it turns (spins) on its axis.
orbit	The curved path that an object follows going around a star or a planet.

What should I already know?

The sun is a light source
The moon reflects light
Gravity is a force

In this topic I will:

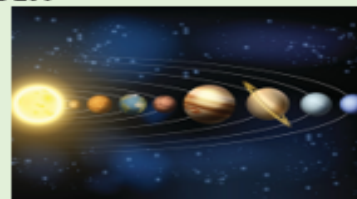
- Know that the Sun, Earth and Moon are approximately spherical
- Investigate the size of the Sun, Earth, Moon
- Know why we have day / night
- Know the movement of the planets in the solar system
- Know that people had different theories about how the planets moved

In investigations I will:

- Identify fair tests
- Identify and use variables
- Make predictions
- Repeat measurements for accuracy
- Ask scientific questions
- Build scientific models to help answer

Sticky Knowledge to remember:

Know the sun is a **star** at the centre of our solar system.



The Sun, Earth and Moon are approximately spherical bodies.

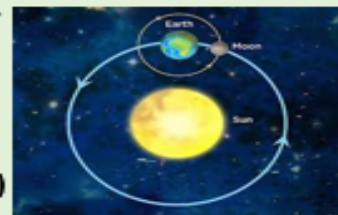
Know the moon orbits the Earth.

It takes about **28 days** to complete its orbit.



Know the Earth orbits the Sun.

It takes **365 1/4 days** to complete its orbit around the Sun. **This is a year.**



Know the Earth rotates (spins) its axis once every 24 hours

