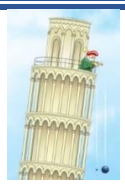
Science Knowledge Organiser

Term: Autumn 1 | **Year: 5** | **Physics: Forces**

BIG QUESTION: HOW DO THINGS MOVE?

Scientists

Galileo Galilei
(1564-1642)



An Italian scientist who proved that the pull of gravity on an object is the same, regardless of the weight of the object.

Sir Isaac Newton
(1643-1726)

An English mathematician and scientist. He discovered the force that makes things like apples fall to the ground is gravity.

Working Scientifically

Key Knowledge & Vocabulary

Air resistance
The force that slows down objects that move through the air.

Buoyancy
An upward force that a liquid applies to objects.

Drag
To cause to slow down.

Force
A force is a push or a pull. Forces make objects start moving, stop moving, speed up, slow down or change direction.

Force-meter
Piece of equipment used to measure the size of a force.

Friction
When one surface moves against another, the sticking or rubbing force that a surface or object encounters is called friction. Friction both stops and makes things move.

Gravity
A force which pulls things down towards the centre of the Earth.

Mechanisms
A device that allows a small force to be increased to a larger force.

Newton
The unit for measuring force.

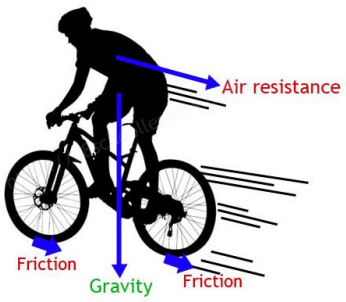
Simple Mechanisms
Levers, pulleys and gears are all types of simple mechanisms.

Streamlined
A shape that minimises the effects of air or water resistance.

Water resistance
The force that slows down objects moving through water.

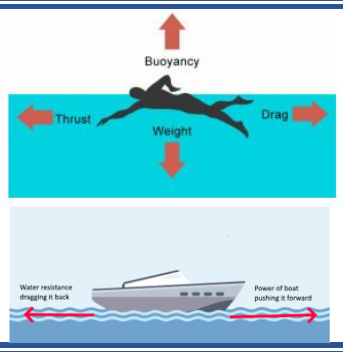
Forces in Action

Gravity & Friction



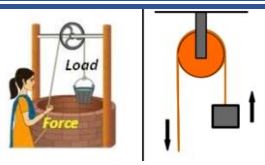
Gravity & Air Resistance

Water Resistance



Simple Mechanisms

A lever tilts on a pivot which is nearer to the end of the pivot with a heavy load.



Pulleys have a rope or cable which goes over a wheel. This is pulled to lift, lower or move heavy objects.

Gears are toothed wheels which lock together and turn each other to form simple machines.

Learning Links

Builds on:	What I am learning now:	Leads to:
Y3 Physics: Forces & Magnets	Y5 Physics: Forces	Y5 Physics: Earth & Space

Science Knowledge Organiser

Term: Autumn 2 | **Year: 5** | **Chemistry: Properties and Changes of Materials**

BIG QUESTION: CAN WE CHANGE MATERIALS?

Changing Materials

Solutions

When a substance dissolves in a solvent, like water, it creates a solution. Its particles spread out so that they can no longer be seen or retrieved by filtering.

Reversible Changes

A reversible change occurs when matter changes physical form but not chemical identity.

Irreversible Changes

An irreversible change happens when a chemical reaction occurs and new materials are formed.

Key Knowledge & Vocabulary

Electrical conductivity
The measure of how easy it is for electricity to pass through a material.

Thermal conductivity
The measure of how easy it is for electricity to pass through a material.

Magnetism
Magnetism is an invisible force or field caused when a magnet (a type of rock) pulls or repels objects made from magnetic materials. Iron, nickel, cobalt and alloys containing these metals (including steel) are magnetic.

Dissolve/dissolving
The process that occurs when a substance is added to a solvent, such as water, to make a transparent solution.

Solution
When a substance dissolves in a solvent, like water, it creates a transparent solution. Its particles spread out so that they can no longer be seen or retrieved by filtering.

Soluble
Substances that dissolve when added to water e.g. salt, sugar.

Insoluble
Substances that do not dissolve when added to water, they stay as a solid e.g. sand, flour.

Mixture
A mixture is a substance in which two or more substances are mixed but not chemically joined together because no chemical reaction has taken place.

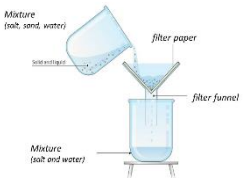
Reversible change
A change that can be undone or changed back.

Irreversible change
A change that cannot be undone or changed back.

Chemical reaction
A process where a substance or set of substances undergoes a chemical change to form a different substance or material.

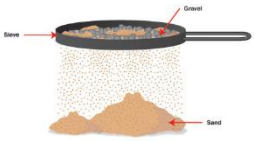
Separating Mixtures & Solution

Filtering



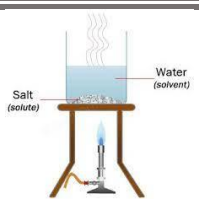
Filtering is used to separate insoluble particles from a liquid (or gas). The liquid passes through the filter paper and the solid is left on the filter paper.

Sieving



Sieving is a method of separating particles of varying sizes. Sieves have a mesh which allows smaller particles to pass through it. Larger particles stay in the sieve.

Evaporating

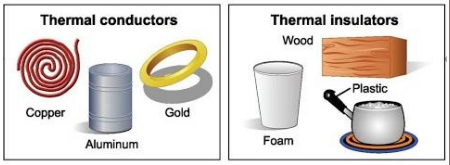


Heating a solution will change a liquid to a vapour. As materials have different boiling points, evaporation can be used to recover a substance from a solution.

What are things made from and why?

An electrical conductor allows electricity to flow through it. An electrical insulator does not.

A thermal conductor allows heat to flow through it. A thermal insulator does not.
When is a thermal insulator useful?



Materials made from iron, nickel, cobalt and alloys containing these metals (including steel) are magnetic. When would this be useful?

Learning Links

Builds on:
Y4 Chemistry: States of Matter

What I am learning now:
Y5 Chemistry: Properties & Changes of Materials

Leads to:
KS3 Chemistry: The Particle Nature of Matter, Chemical Reactions & the Periodic Table

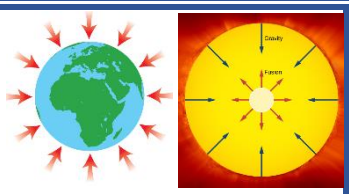
Science Knowledge Organiser

Term: Spring 1 | **Year: 5** | **Physics: Earth and Space**

BIG QUESTION: SUN, EARTH AND MOON - WHAT IS MOVING?

The Sun, Earth and Moon

What shape are the Earth, Sun and Moon?



The Sun, Earth and Moon are spherical because gravity pulls all their particles towards their own centre.

How does the Earth move?

The Sun is at the centre of the solar system. The Earth, and the other planets, orbit around the Sun.

Gravity

Unsupported objects fall towards Earth because of the force of gravity acting between the Earth and the falling object.

Key Knowledge & Vocabulary

Axis
An imaginary line through the middle of something that a body rotates around.

Moon
A natural satellite which orbits Earth or other planets.

Orbit
To move in a regular, repeating curved path around an object.

Planet
A large object, spherical or nearly spherical, that orbits a star and does not emit its own light.

Rotate
To spin or turn quickly around a central point.

Satellite
Any object or body in space that orbits something else.

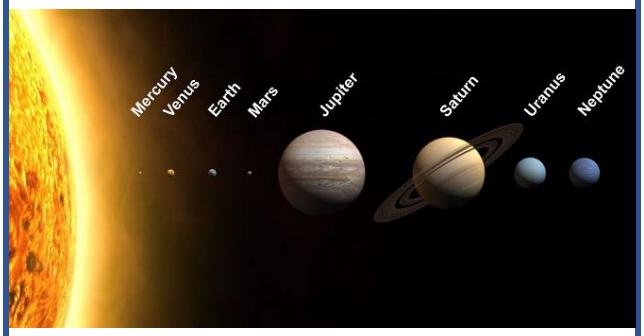
Sphere
A round 3D shape, like a ball.

Star
A giant ball of gas held together by its own gravity that makes its own heat and light energy.

Sun
A huge star that Earth and other planets in or solar system orbit around.

Universe
All of space and everything in it.

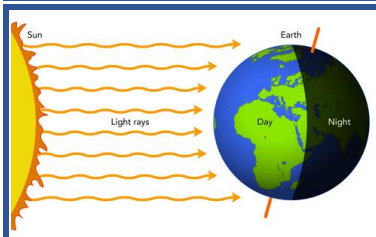
The Solar System



My Very Easy Method Just Speeds Up Naming.

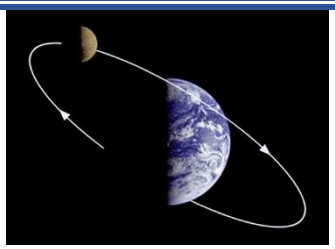
The Sun, Earth and Moon

What causes day and night?



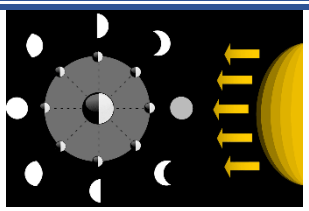
The Earth rotates (spins) on its axis, anti-clockwise, making a full rotation every 24 hours.

How does the Moon move?



The Moon orbits the Earth in an anticlockwise direction, whilst spinning on its axis.

Does the shape of the Moon change?



As the Moon rotates around the Earth, the Sun lights up different parts of it, making it appear to be different shapes.

Scientists

Stephen Hawking studied the structure of the Universe. He developed theories about how the Universe started (the Big Bang), what black holes are and how they work.

Space scientist Maggie Aderin-Pocock has loved looking at the night sky since she was a child, growing up in London. Her determination to succeed helped her dreams come true and she has led projects to make telescopes and satellites which are used to inspect the Earth and the Universe.

Learning Links

Builds on:	What I am learning now:	Leads to:
Y3 Physics: Light	Y5 Physics: Earth and Space	Y6 Physics: Light

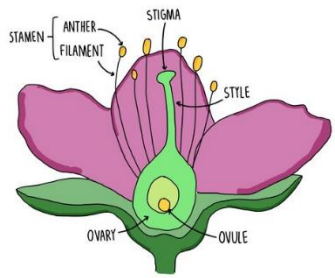
Science Knowledge Organiser

Term: Summer 2 | **Year: 5** | **Biology: Living Things and their Habitats**

BIG QUESTION: DO ALL LIFE CYCLES LOOK THE SAME?

Plants

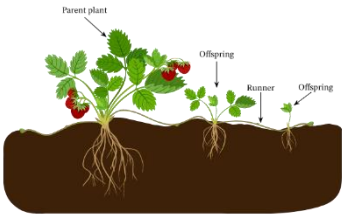
Flowering Plants



Reproduction with seeds

Male and female cells or parents make one offspring, not identical to the parent.

Reproduction without seeds



One parent creates offspring that are exact copies of the parent.

Key Knowledge & Vocabulary

Embryo
An unborn animal or human in the very early stages of development.

Fertilise
Male and female cells meet to develop an embryo or seed.

Germination
If a seed germinates or if it is germinated, it starts to grow into a new plant.

Gestation
The length of a pregnancy.

Life Cycle
The series of changes that take place throughout the life of a living thing, from the beginning of its life until its death.

Metamorphosis
A process by which animals undergo an abrupt and obvious change in the structure of their body and their behaviour.

Pollination
The transfer of pollen to a stigma to allow fertilisation.

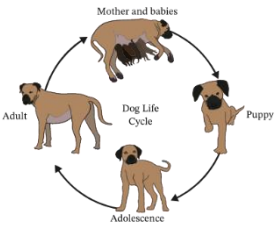
Reproduction
When an animal or plant produces one or more individuals similar to itself.

Stages of Human Development

baby toddler child teenager adult old age

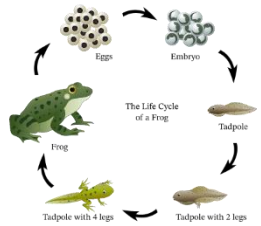
Animals

Mammals



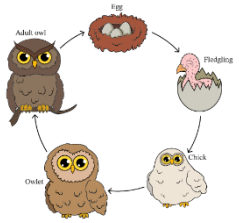
Mammals give birth to live young and make milk to feed their babies.

Insects and Amphibians



Most insects and amphibians go through a metamorphosis.

Birds



Birds lay eggs. A chick will grow inside an egg that has been fertilised.

Jane Goodall (born 1934)

Dr Jane Goodall is a primatologist whose ground-breaking chimpanzee studies in Tanzania, East Africa changed the way we think about wildlife. During her 60-year study, she discovered chimps express emotions (such as sadness, anger and joy), use tools and eat meat.

Learning Links

Builds on:
Y4 Biology: Living Things and their Habitats

What I am learning now:
Y5 Biology: Living Things and their Habitats

Leads to:
Y6 Biology: Evolution and Inheritance