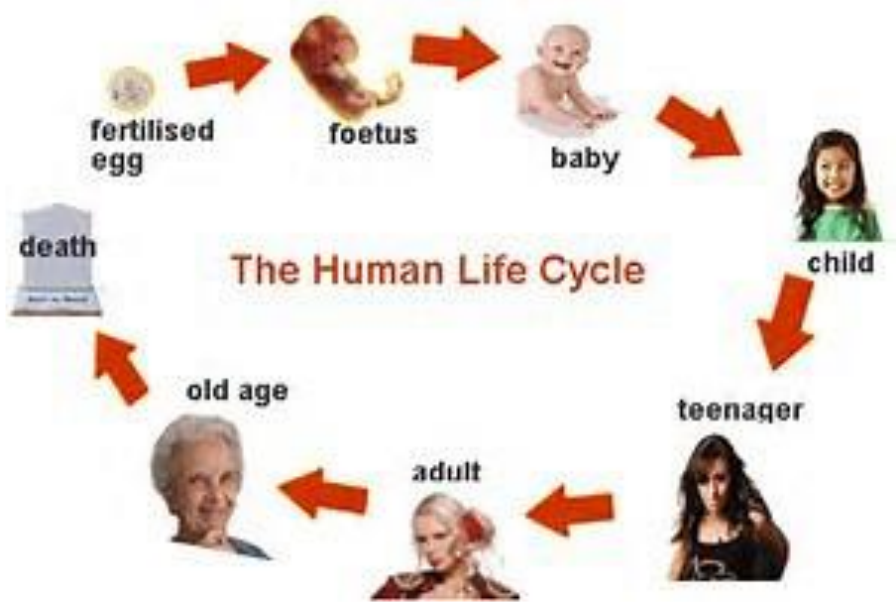
Ladywood Primary School Year 5- Science– Animals including Humans

What should I already know?
Animals can be grouped into vertebrates and invertebrates
Some examples of life cycles
Reproduction and growth are two of the seven life processes.
How to eat healthily.

What will I know by the end of the unit?

What are the main stages of the human life cycle?
Foetus - an unborn animal or human being in the very early stages of development
Newborn- this is a baby that has just been born.
Infancy - this is a period of rapid change. Many toddlers learn to walk and talk at this stage.
Childhood - children learn new things as they grow. They become more independent.
Adolescence - this is when the body starts to change and prepare itself for adulthood. Hormonal changes take place over a few years. This is also known as puberty.
Early adulthood - this is when humans are usually at their fittest and strongest.
Middle adulthood - changes such as hair loss may happen. There are also some hormonal changes again and the ability to reproduce decreases.
Late adulthood - there is a decline in fitness and strength.

What is Puberty?
Puberty is when the body develops
Puberty usually happens between the ages of 10 and 18
During puberty, the bodies of boys and girls begin to change.
Changes for girls
Hair starts to grow on their bodies, breasts develop and hips widen and periods start. (menstruation)
Changes for boys
Hair starts to grow on their bodies, Hair starts to grow on their faces and testicles start to produce sperm



Investigate!
Research the gestation periods of other animals and comparing them with humans.
Collect data around school about height and hand span of different age ranges of pupils. Record the mean, mode and median height of pupils of different ages. Create a graph summarising results.
Compare the growth pattern of humans to other animals.
Create a Venn diagram to show what the similarities and differences are between children, adolescents and adults.

Key Vocabulary

Mature –When a child or young animal matures, it becomes an adult.
Reproduce -when an animal or plant produces one or more individuals similar to itself.
Development – the gradual growth or formation of something.
Gestation -the process in which babies grow inside their mother's body before they are born.
Hormones - a chemical, usually occurring naturally in your body.
Menstruation – the approximately monthly discharge of blood by non-pregnant women.
Fertilisation – the process of the male and female sex cells fusing together.

Ladywood Primary School Year 5 Science – All Living Things and their Habitats

What should I already know?

Animals can be grouped into vertebrates and invertebrates
Some examples of life cycles
The processes of dispersal, fertilisation and germination
Reproduction is one of the seven life processes.
Parts of a plant, their features and what their functions are.

What will I know by the end of the unit?

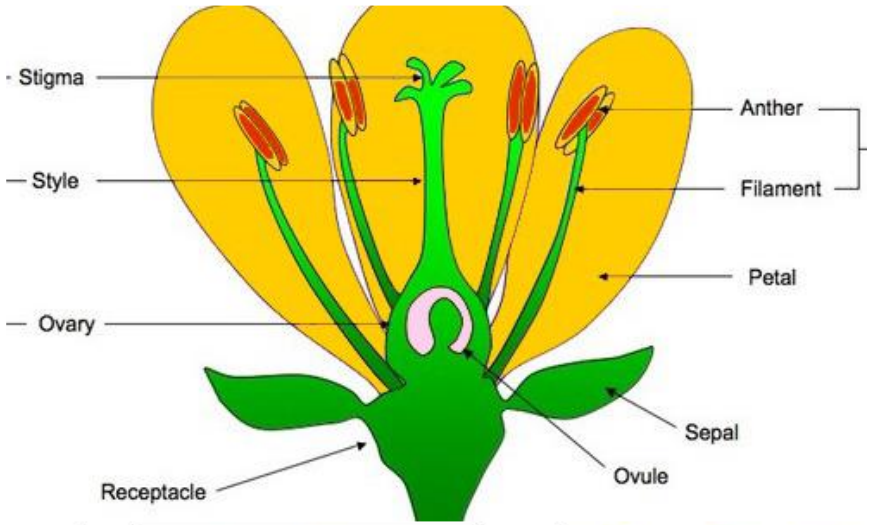
. **What life cycles do I know?**

All living things have a life cycle.

- Life cycle of an insect – Egg, growth to adult or transformation to adult, reproduce, egg.
- Life cycle of a bird – Egg, growth to adult, reproduce, egg.
- Life cycle of a fish - Egg in water, growth to adult, reproduce, eggs in water
- Life cycle of a plant.

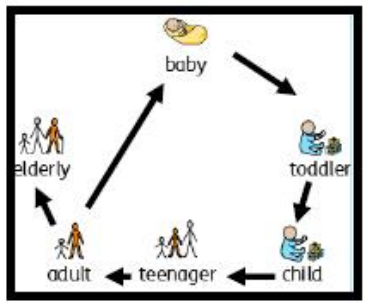
Reproduction in plants

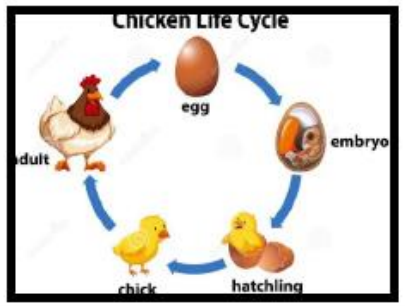
Reproduction is when an animal or plant produces one or more individuals similar to itself:
Sexual reproduction: - This is where the pollen from the stamen of one plant is transferred to the stigma of another. The pollen travels don a tube to the style and fuses with an ovule. It will produce offspring that is similar to but not identical to the parent. (apple trees)
Asexual reproduction: -Pollenates itself. It will produce offspring that is identical to the parent. It requires only one parent (strawberry plants, spider plants)

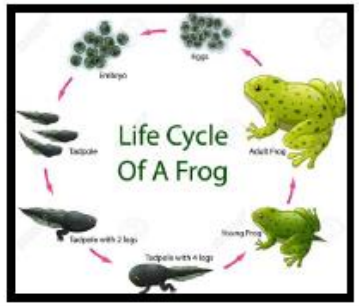


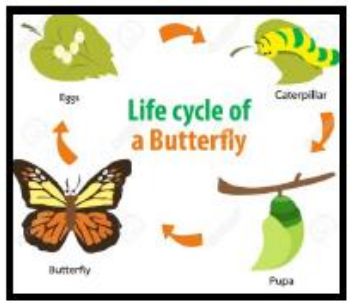
Key Vocabulary

Reproduce -when an animal or plant produces one or more individuals similar to itself.
Fertilisation – the process of the male and female sex cells fusing together.
Anther-the part of a stamen that produces and releases the pollen.
Ovary - aa female organ which produces eggs.
Ovule – a small egg.
style
Stigma - the top of the centre part of a flower which takes in pollen
pollen,-a fine powder produced by flowers. It fertilises other flowers of the same species so that they produce seeds.
Pollination - To pollinate a plant or tree means to fertilise it with pollen. This is often done by insects.
Gamete –Name for cell









Investigate!

Investigation into growing new plants from different parts of a parent plant (e.g. seeds, stem, root cuttings etc.)
Compare the life cycles of mammals, amphibians, insects and birds. What is similar about their life cycles? What is different?
Observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow.
Compare what you already know about David Attenborough, and compare his work to that of Jane Goodall's.

Ladywood Primary School Year 5 Science –Properties and Changes in Materials

What should I already know?

- A variety of everyday materials and their properties.
- How magnets and electrical circuits work.
- Materials that are solids, liquids and gases and their particle structure.
- Some materials change state when they are heated or cooled.
- The roles of evaporation and condensation in everyday life.

What will I know by the end of the unit?

Materials can be grouped by their properties or by more than one of their properties – flexibility, transparency, harness, electric and thermal insulators, magnetism or solubility.

What are thermal insulators and conductors?

Materials which are good thermal conductors allow heat to move through them easily. Thermal insulators do not let heat travel through them easily. Examples of thermal insulators include woollen clothes and flasks for hot drinks.

What are electrical insulators and conductors?

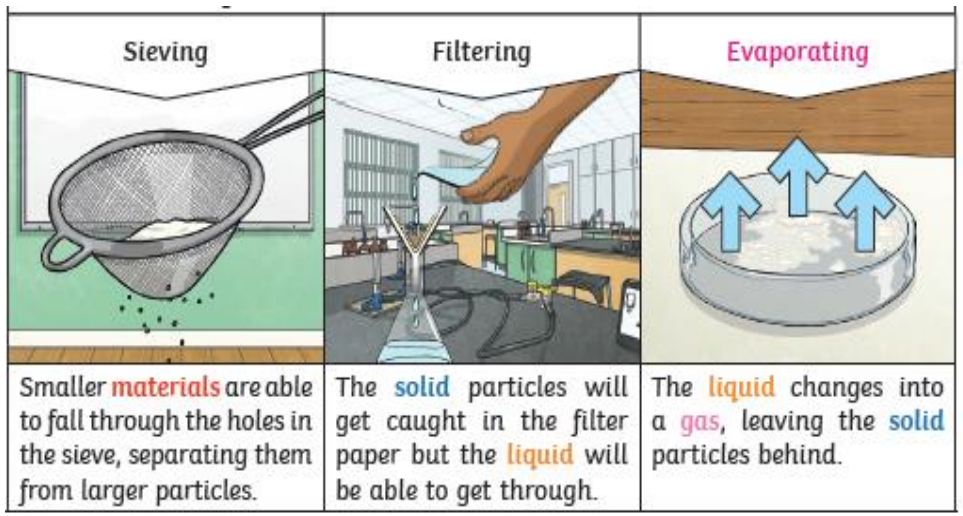
Electrical conductors allow electricity to pass through them easily while electrical insulators do not. Electrical insulators have a high resistance which means that it is hard for electricity to pass through these objects.

What is dissolving?

When the particles of a solid mix with the particles of a liquid, this is called dissolving.
The result is a solution.
Materials that dissolve are soluble- for example sugar.
Materials that do not dissolve are insoluble – for example sand.

Can materials be separated after they have been mixed?

Some materials can be separated after they have been mixed based on their properties - this is called a reversible change. Some methods of separation include the use of a magnet, a filter, a sieve and evaporation.
When a mixture cannot be separated back into the original components, this is called an irreversible change. Examples of this include when materials burn or mixing bicarbonate of soda with vinegar.



Key Vocabulary

Properties – the ways in which an object behaves.
Transparency- how much light something lets in
Solubility – how well something dissolves in a solution.
Conductivity-How much of a substance is passed through it.
Permeability- How much water is soaked up.
Separating – splitting two substances
Mixture- when substances are mixed together
Solution – when substances are mixed together and dissolve
Substance – a material that could be a solid, liquid or gas.
Filtering- a device used to remove dirt or other solids from liquids. a filter can be made of paper, charcoal, or other material with tiny holes in it.
Sieving - a device used to remove other solids from other solids through litter holes.

Investigate!

- Place the same amount of a hot liquid in a thermal insulator and conductor. Measure the temperature over time and plot these on the same line graph. Use the line graph to ask and answer questions.
- Find out if thermal conductors also make good electrical conductors.
- Design an experiment that investigates dissolving - consider which variables you could change. Create a variety of mixtures using materials such as salt, sand, water, paper clips and rice and use a variety of methods to separate them.
- Observe and compare the changes that take place when cakes are baked or bicarbonate of soda mixes with vinegar.

Ladywood Primary School Year 5 Science – Earth and Space

What should I already know?

- We have four seasons.
- The Sun is a source of light but the Moon is not.
- Know that a shadow is caused when an object blocks light from passing through it.

What will I know by the end of the unit?

Our Sun and Solar System?

The sun is a star at the centre of our solar system. The solar system has eight planets; Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.

The first four planets are relatively small and rocky, while the four outer planets are gas giants (Jupiter and Saturn) or ice giants (Uranus and Neptune). There are also asteroids, meteoroids and comets in the Solar System.

The Earth orbits the Sun. The Earth takes one year (365 and a$\frac{1}{4}$) to orbit the Sun. The Earth is held in its orbit round the Sun by the Sun's gravitational pull.

What is a moon?

A moon is a celestial body that orbits a planet.

The Earth has one moon; Jupiter has four large mons and numerous small ones.

The Moon orbits the Earth. It takes about 28 days for the Moon to orbit the Earth. The Moon is held in its orbit round the Earth by the Earth's gravitational pull. The Moon's gravity causes high and low tides.

The moon appears to change shape because we cannot always see the side of the Moon that's in sunlight or we can only see part of the sunlit side of the Moon as it orbits Earth.

Our Earth

The Earth spins on its own axis. It takes 24 hours (1 day) to completely rotate on its axis. The Earth spins once in a day. The side of the Earth facing the Sun is in daytime. The side of the Earth facing away from the Sun is in night time. The Sun doesn't move - it is us that move. Because the Earth is rotating, the Sun appears to move across the sky as the day goes on.

Key Vocabulary

Galaxy -an extremely large group of stars and planets. Our galaxy is called the Milky Way.

Star- a giant ball of gas held together by its own gravity.

Universe - the whole of space and all the stars, planets, and other forms of matter and energy in it.

Asteroid - a rock that orbits the Sun in a belt between Mars and Jupiter.

Comet - a bright object with a long tail that travels around the Sun.

Meteoroid -a rock from outer space that has landed on Earth.

Axis-an imaginary line through the middle of something

Orbit -the curved path in space that is followed by an object going round and round a planet, moon, or star - turns quickly around a central point

Leap year -a year which has 366 days. The extra day is the 29th February. There is a leap year every four years.

Rotate –to spin.

Investigate!

- Compare the time of day at different places on Earth.
- Construct shadow clocks and sundials.
- Keep a Moon diary over the course of a month - what do you notice?

Ladywood Primary School Year 5 Science – Forces

What should I already know?

- Know that a push and pull are types of forces.
- That when forces are applied to an object, they allow them to move or stop moving.
- The strength of the force determines how far and fast an object moves.
- To know what friction is and explain how it affects forces.
- That magnets have poles, and that opposite poles attract, while similar poles repel.

What will I know by the end of the unit?

What are forces?

Forces are pushes and pulls. That motion of an object. They will make it start to move or speed up, slow it down or even make it stop.

For example, when a cyclist pushes down on the pedals of a bike, it begins to move. The harder the cyclist pedals, the faster the bike moves. When the cyclist pulls the brakes, the bike slows down and eventually stops.

What is gravity?

Gravity is the forces that pulls objects down towards the centre of the Earth. Gravity stops things from floating away into space. When things go into the air (like a football) gravity pulls them back down.

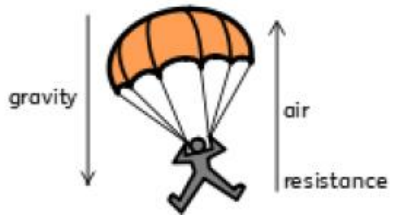
What is friction?

Friction is a force - it is the resistance of motion when one object rubs against another. Isaac Newton is thought to have developed his theory of gravity when he saw an apple fall to the ground from an apple tree.

Other forces that create resistance of motion include **water resistance** and **air resistance.**

Air resistance pushes up on the parachute, opposing the force of gravity . This makes the parachute land more slowly.

Water resistance is the friction that is created between water and an object that is moving through it. Some objects can move through water with less resistance if they are streamlined.



Investigate!

- Draw diagrams to show how objects move down ramps, through the air and through water, using arrows to show the direction of the forces.
- Explore the effects of friction on motion and find out how it slows or stops moving objects, for example, by observing the effects of a brake on a bicycle wheel.
- Investigate how surface area affects air resistance and make parachutes to investigate how air resistance works..
- Explore resistance in water by making and testing boats of different shapes.
- Design and make products that use levers, pulleys, gears and/or springs and explore their effects

What are examples of mechanisms?

Levers allow us to do heavy work with less effort . For example, trying to pick up a large heavy box is difficult, however if a lever is used it becomes much easier to move it.

Pulleys also allow us to do heavy work - objects are attached to ropes and pulley wheels, and so instead of lifting heavy object upwards, we can pull on the pulley rope downwards.

Gears are toothed wheels. Their 'teeth' can fit into each other so that when the first wheel turns, so does the next one. This allows forces to move across a surface.

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.

lever

pulley

gear

spring

Key Vocabulary

Resistance –a force which slows down a moving object or vehicle.

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.

Surface – the top layer of something.

Buoyancy –an upward force that a liquid applies to objects.

Streamlined-a streamlined vehicle, animal, or object has a shape that allows it to move quickly or efficiently through air or water.

Mechanisms -parts which work together in a machine. examples of mechanisms are pulleys, gears and levers.