

## Year 5-Animals including Humans- Autumn 1 Term Knowledge Organiser

What should I already know?

Building on Yr 1 and 2 to identify features of the body that change and moving on to more complex and internal changes.

## How has the Victorian period affected our lives?

### Key vocabulary

Fertilisation-the process of the male and female sex cells fusing together.

Prenatal- the stage of development from the time of fertilisation to the time of birth.

Gestation-the process or time when prenatal development takes place before birth.

Reproduce-to produce young.

Asexual reproduction- a process where one parent produces new life.

Sexual reproduction- a process where two parents – one male and one female – are required to produce new life.

Life cycle- the changes a living thing goes through, including reproduction

Adolescence- the social and emotional stage of development between childhood and adulthood.

Puberty- the physical stage of development between childhood and adulthood.

Menstruation-when the female body discharges the lining of the uterus. This happens approximately once a month. Adulthood- the stage of development when a human is fully grown and mature.

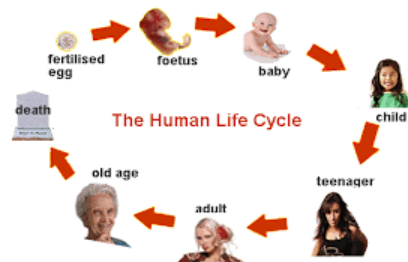
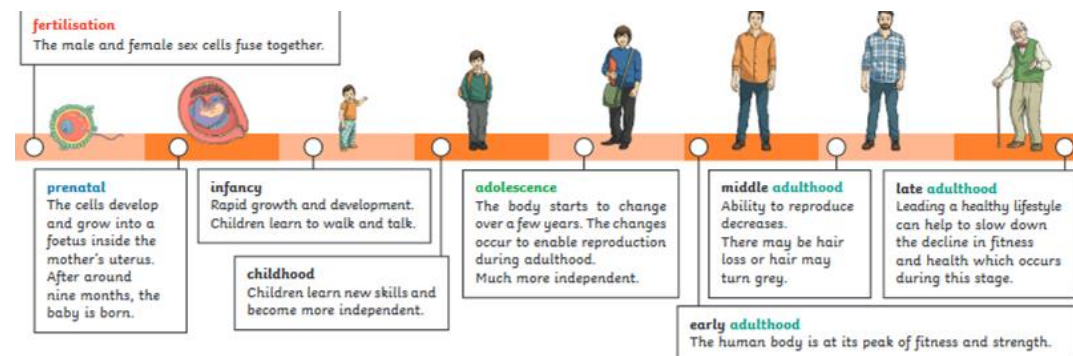
Life expectancy- the length of time, on average, that a particular animal is expected to live.

National Curriculum objectives:

- describe the changes as humans develop to old age.



### Knowledge:



### Skills and enquiry

Pupils should draw a timeline to indicate stages in the growth and development of humans. They should learn about the changes experienced in puberty. Pupils could work scientifically by researching the gestation periods of other animals and comparing them with humans; by finding out and recording the length and mass of a baby as it grows.



## Year 5-Properties and changes of materials- Autumn 2 Term Knowledge Organiser

### What should I already know?

In Year 2 and 3, children look at the properties of materials to group and compare. They also consider how properties of materials make them suitable or not suitable for a particular purpose.

## How do rivers differ?

### Key vocabulary

**Materials**-the substance that something is made out of, e.g. wood, plastic, metal.

**Solids**-one of the three states of matter. Solid particles are very close together, meaning solids, such as wood and glass, hold their shape.

**Liquids**-this state of matter can flow and take the shape of the container because the particles are more loosely packed than solids and can move around each other. Examples of liquids include water and milk.

**Gases**-one of the three states of matter. Gas particles are further apart than solid or liquid particles and they are free to move around. Examples of gases are oxygen and helium.

**Melting**-the process of heating a solid until it changes into a liquid.

**Freezing**-when a liquid cools and turns into a solid.

**Evaporating**-when a liquid turns into a gas or vapour.

**Condensing**-when a gas, such as water vapour, cools and turns into a liquid

**Conductor**-a conductor is a material that heat or electricity can easily travel through. Most metals are both thermal conductors (they conduct heat) and electrical conductors(they conduct electricity).

**Insulator**-an insulator is a material that does not let heat or electricity travel through them. Wood and plastic are both thermal and electrical insulators.

**Transparency**-a transparent object lets light through so the object can be looked through, for example glass or some plastics.

### National Curriculum objectives:

- compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets
- know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- demonstrate that dissolving, mixing and changes of state are reversible changes
- explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.

### Knowledge:

Different materials are used for particular jobs based on their properties: electrical conductivity, flexibility, hardness, insulators, magnetism, solubility, thermal conductivity, transparency. For example, glass is used for windows because it is hard and transparent. Oven gloves are made from a thermal insulator to keep the heat from burning your hand. Materials can change states, for example solids can melt and become liquids and liquid can evaporate into a gas.

Reversible changes, such as mixing and dissolving solids and liquids together, can be reversed by: sieving, filtering or evaporating.

\*Sieving-Smaller materials are able to fall through the holes in the sieve, separating them from larger particles.

\*Filtering-The solid particles will get caught in the filter paper but the liquid will be able to get through.

\*Evaporating-The liquid changes into a gas, leaving the solid particles behind.


Irreversible changes often result in a new product being made from the old materials (reactants). For example, burning wood produces ash. Mixing vinegar and milk produces casein plastic

### Skills and enquiry


Pupils should build a more systematic understanding of materials by exploring and comparing the properties of a broad range of materials, including relating these to what they learnt about magnetism in year 3 and about electricity in year 4. They should explore reversible changes, including, evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes. Pupils should explore changes that are difficult to reverse, for example, burning, rusting and other reactions, for example, vinegar with bicarbonate of soda. They should find out about how chemists create new materials, for example, Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinkle-free cotton. Pupils might work scientifically by: carrying out tests to answer questions, for example, 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?' They might compare materials in order to make a switch in a circuit. They could observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes. They might research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials

**Dissolving**  
A solution is made when solid particles are mixed with liquid particles. Materials that will dissolve are known as soluble. Materials that won't dissolve are known as insoluble. A suspension is when the particles don't dissolve.


Sugar is a soluble material.




Sand is an insoluble material.




**Sieving**



**Filtering**



**Evaporating**



## Year 5-Forces- Spring Term Knowledge Organiser

### What should I already know?

In Year 3, children learnt about friction and how objects move on different surfaces.

### National Curriculum objectives:

- 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

# How has Egypt changed since ancient times?

### Key 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.

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

### Knowledge:

Forces can make an object start to move, stop moving, change direction, move faster, change its shape or move more slowly. Isaac Newton is famously thought to have developed his theory of gravity when he saw an apple fall to the ground from an apple tree. 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. 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).



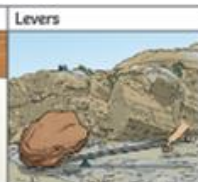
Examples of forces in action:

\*swimming- a swimmer's force and water resistance

\*a hot air balloon- gravity and air resistance

\*cycling- cyclist's driving force and friction.

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. Streamlined objects, like sharks, do not create as much water resistance so can move through water quickly. Their pointed nose cuts through the water and a smooth, curved back allows water to flow over and around it.

Pulleys	Gears/Cogs	Levers
		
Pulleys can be used to make a small <b>force</b> lift a lighter load. The more wheels in a pulley, the less <b>force</b> is needed to lift a <b>weight</b> .	Gears or cogs can be used to change the speed, <b>force</b> or direction of a motion. When two gears are connected, they always turn in the opposite direction to each other.	Levers can be used to make a small <b>force</b> lift a lighter load. A lever always rests on a pivot.

### Skills and enquiry

Pupils should explore falling objects and raise questions about the effects of air resistance. They should explore the effects of air resistance by observing how different objects such as parachutes and sycamore seeds fall. They should experience forces that make things begin to move, get faster or slow down. Pupils should explore the effects of friction on movement and find out how it slows or stops moving objects, for example, by observing the effects of a brake on a bicycle wheel. Pupils should explore the effects of levers, pulleys and simple machines on movement. Pupils might find out how scientists, for example, Galileo Galilei and Isaac Newton helped to develop the theory of gravitation. Pupils might work scientifically by: exploring falling paper cones or cup-cake cases, and designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective. They might explore resistance in water by making and testing boats of different shapes. They might design and make products that use levers, pulleys, gears and/or springs and explore their effects.

## Year 5-Earth and Space- Summer 1 Term Knowledge Organiser

### What should I already know?

Children understand from KS1 how daylight changes over different seasons and are now looking at changes over the course of a day and reasons for these changes.

## Will the next space travel be similar to the moon landing?

### Key vocabulary

Sun- a huge star that Earth and the other planets in our solar system orbit around.

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

Moon-a natural satellite which orbits Earth or other planets.

Planet-a large object, round or nearly round, that orbits a star.

Sphere-a round 3D shape in the shape of a ball.

Spherical bodies- astronomical objects shapes like spheres.

Satellite-any object or body in space that orbits something else, for example: the Moon is a satellite of Earth.

Orbit-to move in a regular, repeating curved path around another object.

Rotate-to spin. E.g. Earth rotates on its own axis.

Axis-an imaginary line that a body rotates around. E.g. Earth's axis(imaginary line) runs from the North Pole to the South Pole.

Geocentric model- a belief people used to have that other planets and the Sun orbited around Earth.

Heliocentric model-the structure of the Solar System where the planets orbit around the Sun.

Astronomer- someone who studies or is an expert in astronomy (space science).



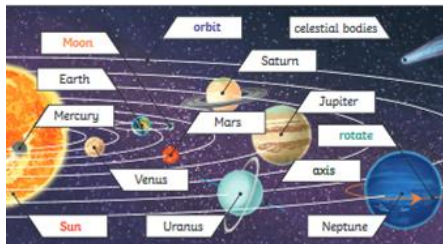
### National Curriculum objectives:

- describe the movement of the Earth, and other planets, relative to the Sun in the solar system
- describe the movement of the Moon relative to the Earth
- describe the Sun, Earth and Moon as approximately spherical bodies
- use the idea of the Earth's rotation to explain day and night, and the apparent movement of the sun across the sky.



### Knowledge:

Mercury, Venus, Earth and Mars are rocky planets. They are mostly made up of metal and rock. Jupiter, Saturn, Uranus and Neptune are mostly made up of gases (helium and hydrogen) although they do have cores made up of rock and metal. Pluto used to be considered a planet but was reclassified as a dwarf planet in 2006. The Moon orbits Earth in an oval-shaped path while spinning on its axis. At various times in a month, the Moon appears to be different shapes. This is because as the Moon rotates around Earth, the Sun lights up different parts of it. Earth rotates (spins) on its axis. It does a full rotation once in every 24 hours. At the same time that Earth is rotating, it is also orbiting (revolving) around the Sun. It takes a little more than 365 days to orbit the Sun. Daytime occurs when the side of Earth is facing towards the Sun. Night occurs when the side of Earth is facing away from the Sun. It appears to us that the Sun moves across the sky during the day but the Sun does not move at all. It seems to us that the Sun moves because of the movements of Earth. Years ago people believed that planets moved around the Earth. This was called the Geocentric model. The work and ideas of many astronomers (such as Copernicus and Kepler) combined over many years before the idea of the heliocentric model was developed. Galileo's work on gravity allowed astronomers to understand how planets stay in orbit.



### Skills and enquiry

Pupils should be introduced to a model of the Sun and Earth that enables them to explain day and night. Pupils should learn that the Sun is a star at the centre of our solar system and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006). They should understand that a moon is a celestial body that orbits a planet (Earth has one moon; Jupiter has four large moons and numerous smaller ones). Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. Pupils should find out about the way that ideas about the solar system have developed, understanding how the geocentric model of the solar system gave way to the heliocentric model by considering the work of scientists such as Ptolemy, Alhazen and Copernicus. Pupils might work scientifically by: comparing the time of day at different places on the Earth through internet links and direct communication; creating simple models of the solar system; constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day; finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks.

## Year 5-Living things and their habitats- Summer 2 Term Knowledge Organiser

### What should I already know?

In Year 3, children learn the life cycle of plants. Earlier in Year 5, children have learnt about the life cycle of humans.. Children know animals reproduce to create offspring.

### National Curriculum objectives:

- describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
- describe the life process of reproduction in some plants and animals.



### Knowledge:

Humans develop inside their mothers and are dependent on their parents for many years until they are old enough to look after themselves. Amphibians such as frogs are laid in eggs then, once hatched, go through many changes until they become an adult. Some animals, such as butterflies, go through metamorphosis to become an adult. Birds are hatched from eggs and are looked after by their parents until they are able to live independently.

Some living things, such as plants, contain both the male and female sex cells. In others, such as humans, they contain either the male or female sex cell.

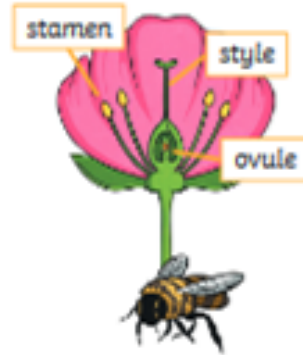
Reproduction in mammals:

\*Mammals use sexual reproduction to produce their offspring.

- The male sex cell, called the sperm, fertilises the female sex cells.
- The fertilised cell divides into different cells and will form a baby with a beating heart.
- The baby will grow inside the female until the end of the gestation period when the baby is born.

Reproduction in plants:

\*Most plants contain both the male sex stamenovulestylecell (pollen) and female sex cell (ovules), but most plants can't fertilise themselves. Wind and insects help to transfer pollen to a different plant. The pollen from the stamen of one plant is transferred to the stigma of another. The pollen then travels down a tube through the style and fuses with an ovule. Some plants, such as strawberry plants, potatoes, spider plants and daffodils use asexual reproduction to create a new plant. They are identical to the parent plant.



## How is England important in Europe?

### Key vocabulary

Asexual reproduction-one parent is needed to create an offspring, which is an exact copy of the parent.

Fertilise-the action of fusing the male and female sex cells in order to develop an egg.

Gestation- the length of a pregnancy.

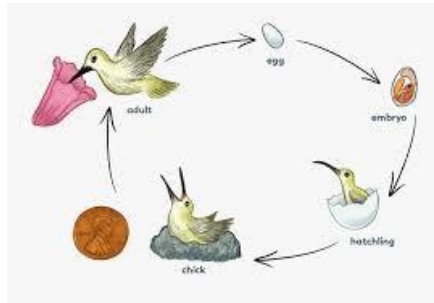
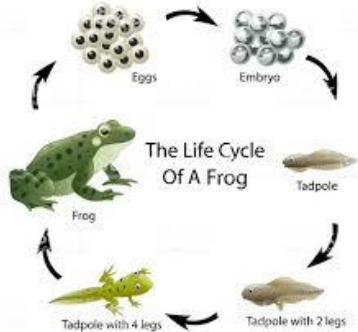
Life cycle-the journey of changes that take place throughout the life of a living thing including birth, growing up and reproduction.

Metamorphosis- an abrupt and obvious change in the structure of an animal's body and their behaviour.

Pollination-the transfer of pollen to a stigma to allow fertilisation.

Reproduction-the process of new living things being made.

Sexual reproduction-two parents are needed to make offspring which are similar but not identical to either parent.



### Skills and enquiry

Pupils should study and raise questions about their local environment throughout the year. They should observe life-cycle changes in a variety of living things, for example, plants in the vegetable garden or flower border, and animals in the local environment. They should find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall. Pupils should find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals. Pupils might work scientifically by: observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times), asking pertinent questions and suggesting reasons for similarities and differences. They might try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. They might observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow.