

Year 5 Topic: Animals inc. humans



Key questions:

- Know about life cycles
- Explore gestation periods
- Explore how propagation is used to grow plants
- Describe the changes you go through from birth
- Understand changes which happen in adolescence
- Describe the changes as humans develop to old age



Independence and Ambition

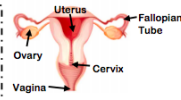
This topic will link to our 'Independence and Ambition' driver, as we find out about how animals including humans develop, change and mature through life.

Key Facts and Dates

Reproductive organs and cells

Female Reproductive System

The female reproductive organs are designed to enable fertilisation and birth. Each month, a female releases an egg from her **ovary**, which travels down the **fallopian tube** towards the **uterus**. If it meets a male sperm and fertilises, the baby is grown inside the uterus. The entrance of the **vagina** is able to widen, which allows the new-born baby to emerge.



Male Reproductive System

The male reproductive system works by the **testes** producing and storing millions of tiny **sperm cells**. During sexual intercourse, the sperm travels through the **vas deferens** in a fluid called **semen** and into the **urethra**. During ejaculation, millions of sperm cells are released from the **penis** and one can fertilise a female egg – the start of making a baby.

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Fertilisation

This is the point when the **sperm** and **egg cell** meet inside the female. When a male **ejaculates**, millions of sperm swim to meet the egg. Many of these are killed or destroyed, but a survivor will penetrate the egg. The sperm and the egg each contain 23 **chromosomes**; once these cells have fused together, a **zygote** is formed, which contains the 46 chromosomes which make up a human being.



During puberty, we can expect to grow, for hair to grow on our bodies and for genitalia to grow. It can also affect our mood due to hormonal changes.



What you should already know...

- Food chains are used to show how living things get their food
- Food chains are made up of producers and consumers
- Humans have incisor, canine, pre-molar and molar teeth, each with different jobs. Animals have different make-ups of teeth depending on their food.
- The digestive system has several functions, including ingestion, absorption and excretion. It is made up of different parts, e.g the stomach

What is the growth development of animals?

Humans	House Mice	African Elephants	Saltwater Crocodiles	Blue Whales
Gestation Period: 9 months	Gestation Period: 20 days	Gestation Period: 22 months	Gestation Period: 2-3 months	Gestation Period: 10-12 months
Sexual Maturity: 11-17 years	Sexual Maturity: 4-6 weeks	Sexual Maturity: 10-12 years	Sexual Maturity: 10-12 years	Sexual Maturity: 10 years
Life Expectancy: 80 years	Life Expectancy: 1 year	Life Expectancy: 60 years	Life Expectancy: 70 years	Life Expectancy: 90 years

Animals use some of the energy from the food they eat to grow. During the growth process they change and mature into an adult – similar to humans. This process is known as development.

How do we age to old age?

Muscle mass decreases and muscles lose strength. Wrinkles develop on the skin, and it loses elasticity. Hair begins to turn grey/white. Many people begin to lose the hair on their heads. Fertility decreases. People begin to shrink in height as bones and cartilage become worn down. Organs begin to lose their effectiveness, and the senses become weaker.

Vocabulary

Reproduce	To make again or to make a copy
Adult	Fully grown
Foetus	Unborn human or animal in the later stages of development before it is born.
Embryo	Unborn human or animal in the early stages of development before it is born.
Puberty	The period of life when a person's sexual organs mature.
Gestation	The process and period of time between conception and birth
Breeding	The mating and production of offspring by animals
Propagation	The breeding of specimens of a plant or animal by natural processes from the parent stock
Horticulturalist	Somebody who cultivates gardens, orchards or nurseries
Clone	An organism or cell which is produced asexually and is genetically identical to its ancestors.
Motor skills	An action that involves using muscles
Childhood	A stage of life that starts at birth and ends at adolescence
Adolescence	Period of life caused by the onset of puberty developing to adult
Hormone	Natural substance produced in the body that influences the bodies growth
Cardiovascular	Relating to the heart and blood vessels
Neurodegenerative	Degeneration of the nervous system

Human Ageing Timeline



Year 5 Topic: Living things & their habitats



Key questions:

- What is the life process of a plant?
- What is the life cycle of a mammal?
- Can you compare the life cycle of insects and amphibians?
- Do you understand the life cycle of birds and reptiles?
- What do you know about the work and life of Jane Goodall and David Attenburgh?



Curiosity

This topic will link to our 'Curiosity' driver, as we find out about how living things develop, grow, change and mature through life. How these things can and should be





Key Facts and Dates

What is a naturalist and an animal Behaviourist?

Naturalists - A natural scientist studies animals and plants by observation, rather than by experimenting. Sir David Attenborough, who is known for presenting information and findings about animals through innovative and engaging television programmes is a naturalist.
Animal Behaviourists - make scientific studies of everything that animals do, from observations and experiments. Dr Jane Goodall, who is best known for her 55 year study of the behaviour of chimpanzees and is a founder of a conservation institute is an animal behaviourist.

What is the life cycle of an animal?

A life cycle is the series of changes that an animal goes through in its life, including reproduction.

Mammals	Amphibians	Insects	Birds
-Mammals have a 3-stage life cycle: -Stage 1: The gestation period - the embryo grows inside the mother & is dependent on her. -Stage 2: The young mammal grows and develops independence. -Stage 3: Adult mates in order to reproduce.	-Many amphibians have a 5-stage life cycle: -Stage 1: Female lays eggs, fertilized by the male. -Stage 2: Tadpole breathes in water through gills. -Stage 3: Grows fins and develops lungs. -Stage 4: Tadpole grows front legs, jumps from water onto land. -Stage 5: Starts to eat insects/plants. Takes 2-4 years to become adult.	-Most insects undergo metamorphosis and have a life cycle of 4 stages: -Stage 1: Eggs laid by female insect. -Stage 2: Eggs hatch into larva, e.g. caterpillars, maggots, grubs. -Stage 4: The pupa (hard coating) is formed. Inside this, the larva transforms. -Stage 5: The adult breaks out of the pupa and matures.	-Birds have a 3-stage life cycle: -Stage 1: Eggs laid by the mother. Parents care for the egg until hatching. -Stage 2: Mother and father feed the bird until it is independent. -Stage 3: Adult mates in order to reproduce.
			

What is the life cycle of a plant?

Plants are able to reproduce in 2 ways: Sexual and Asexual reproduction

Sexual reproduction - is cyclical, follows this process:
 1. Germination - The plant begins to grow from a seed. Roots from under the soil and a stem, leaves and flower shoots above the surface.
 2. Pollination - Pollen produced by the flower is carried by insects or blown by the wind to another flower.
 3. Fertilisation - The pollen reaches another flower and makes its way to the ovary, where it is fertilized.
 4. Dispersal - The seeds are scattered by animals or the wind.
Asexual reproduction - plants produce an identical copy of themselves. This happens in different ways. Some plants produce bulbs. Others produce tubers. Tubers lie below the soil and grow into plants the next year.

What you should already know...



- There are seven common features of living things - Movement, Respiration, Sensitivity, Growth, Reproduction, Excretion & Nutrition
- Animals can be grouped into vertebrates and invertebrates. They can be grouped into further categories, e.g. mammals, reptiles, birds, etc.
- Plants can also be categorized in many different ways, e.g. flowering and non-flowering plants
- Animals are often adapted to the habitats they live in. Both natural and man-made events can change habitats over time, placing animals in danger

Vocabulary

Living organism	Something that can move, use energy and reproduce
Naturalist	An expert in the studies of natural history
Primatologist	A person who carries out a scientific study of primates
Metamorphosis	Insects and amphibians transforming from larval stage to adult form
Endangered	An animal is endangered when very few of them are alive
Asexual	One parent is needed to create an offspring
Reproduction	The process of new living things being made, sexually or asexually
Fertilise	The action of fusing the male and female sex cells in order to develop an egg. When the sperm and egg cell join.
Gestation	The length of pregnancy
Life cycle	The journey of changes that take place throughout the life of a living thing including birth, growing up and reproduction
Placental mammal	has live young which develop before birth inside a female mammal
Monotreme	A mammal who lays eggs to reproduce

Human Life Cycle

Embryo



Baby



Childhood



Adulthood - can reproduce



Embryo

Year 5 Topic: Earth & Space



Key questions:

- What is the significance of the Sun and Moon?
- What is the Solar System?
- Can you give key facts for the planets?
- What are the planets in our solar system?

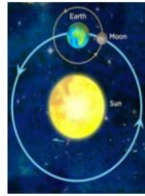


Curiosity

This topic will link to our 'curiosity' driver, as we find out about how Earth and Space correlate to one another. How Scientists carry out investigations and observations to prove theories.

Key Facts and Dates

The Sun and Moon



- The Sun is a star: a huge ball of hot **gas** that gives off light and heat. The Earth and all planets orbit the Sun.
- It takes just over **365** days to make one orbit around the sun - 1 year.
- The Earth and planets are held in place around the Sun by gravity.
- The Earth is always spinning around. When Earth is facing the Sun it's day. When facing away it's night. It takes 24 hours to complete a spin.
- Some objects orbit around the planets; these are moons. The Earth has 1 moon. The moon is much smaller than the Earth, and takes one full day to complete an orbit around the Earth.

The Solar System

- The solar system includes the Sun and all of the objects that orbit around it due to gravity.
- The 5 dwarf planets are: Haumea, Makemake, Ceres, Eris and Pluto.
- Earth is the only known planet in the solar system with living things. Planets closer to the sun are thought to be too hot and planets further away are too cold.
- You could fit roughly 1.3 million Earths into the Sun!
- Many of the planets have moons. Jupiter has around 80 moons!
- The stars in our galaxy are called The Milky Way. The Milky Way is one of billions of galaxies in the universe!

Planet facts

Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune
Area: 0.147 Earths 8 th Largest	Area: 0.902 Earths 6 th Largest	Area: 1 Earth 5 th Largest	Area: 0.284 Earths 7 th Largest	Area: 121.9 Earths 1 st Largest	Area: 83.7 Earths 2 nd Largest	Area: 15.91 Earths 3 rd Largest	Area: 14.98 Earths 4 th Largest
Moons: None	Moons: None	Moons: 1 moon	Moons: 2 moons	Moons: Around 80 moons	Moons: Around 65 moons	Moons: Around 30 moons	Moons: Around 15 moons
Length of Day: 1,408 hours	Length of Day: 5,832 hours	Length of Day: 24 hours	Length of Day: 25 hours	Length of Day: 10 hours	Length of Day: 11 hours	Length of Day: 17 hours	Length of Day: 16 hours
Length of Year: 88 days	Length of Year: 225 days	Length of Year: 365 days	Length of Year: 687 days	Length of Year: 12 Years	Length of Year: 29 Years	Length of Year: 84 Years	Length of Year: 165 Years

What you should already know...

- The Earth (our planet) is a part of the solar system. At the centre of the Solar System is the Sun. The Sun is a star
- There are 8 planets and 5 dwarf planets in the Solar System, which orbit (go around) the Sun.
- The Earth rotates on its axis once every 24 hours (one day). This causes day and night, as different parts of the planet face the Sun.
- The Moon orbits around the Earth. The Sun, Earth and Moon are all roughly spherical.



Vocabulary

Sun	A huge star that Earth and other planets in our solar system orbit
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 shaped like spheres
Satellite	Any object or body in space that orbits something else, for example: the moon is a satellite of Earth
Orbit	The process of new living things being made
Rotate	Two parents are needed to make offspring which are similar but not
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	A belief people used to have that other planets and the Sun orbited around the Earth
Heliocentric	The structure of the Solar System where the planets orbit the Sun
Astronomer	Someone who studies/an expert in astronomy (space science)



The Planets



Year 5 Topic: Forces



Key questions:

- What is gravity and what impact does it have on the Earth? Who is Sir Isaac Newton?
- How do forces work in machines and mechanisms?
- What are the different forces that affect daily life?



Resilience

This topic will link to our 'resilience' driver, as we find out about Forces in the world and daily life. We will also find out about Sir Isaac Newton and his perseverance to prove his theory of gravity.

Key Facts and Dates

Gravity

-It has been around since the beginning of the Universe, and applies to all matter in the universe.
-The bigger an object's mass, the more gravity it will have. The smaller the mass of an object, the less gravity it will be subject to.
-Without gravity we would fly right off the planet! The moon's gravity causes our ocean tides on Earth. The Sun's gravity keeps Earth in orbit around the Sun.
-We don't actually 'feel' gravity. We only feel the effects of trying to overcome it by jumping or when we fall.
-Sir Isaac Newton discovered gravity around 300 years ago, when he saw an apple fall from a tree and he wondered what force made it fall.

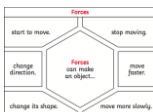


attracts all matter towards each other.

Machines and Mechanisms

-Simple machines and mechanisms include **pulleys, gears** and **levers**. They can be used to turn a small force into larger forces. Machines mean we can accomplish things more easily.
-Levers give an extra pulling or pushing force
-Gears are different size cogs which work together to give extra force
-Pulleys are wheels and ropes that work together to lift heavy objects.

Forces



There are a number of different forces that can affect us in our daily lives:

- applied force
- friction
- air resistance
- water resistance
- surface resistance
- gravity
- mechanisms
- streamline
- buoyancy



What you should already know...

- Forces are pushes and pulls which make things move and stop.
- Most forces need contact between objects, but magnets can act at a distance.
- Magnets are made of a material that creates a magnetic field
- Forces are shown by arrows in diagrams. The bigger the arrow the bigger the force.
- When forces are unbalanced, objects can speed up, slow down, or change direction

Vocabulary

Forces	Pushes or pulls
Gravity	A pulling force exerted by the Earth (or anything 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 that a liquid applies to objects
Buoyancy	An upward force that a liquid applies to objects
Streamlined	When an object is shaped to minimize the effects of air or water resistance
Mechanism	Parts which work together in a machine. Examples of mechanisms are pulleys, gears and levers

Machines and Mechanisms

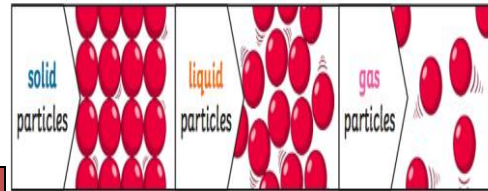
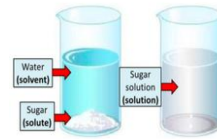
- Scissors Wheelbarrows Fishing rods Shovels Boat Oars Well Exercise Equipment Elevators Window Blinds Brooms

Year 5 Topic: Properties & changes of materials



Key questions:

- What are reversible and irreversible changes?
- How can we group materials by property?
- What are solutions and separations?



Sustainability

This topic will link to our 'sustainability' driver, as we find out about materials, their changes of state and the effect this has on Earth.

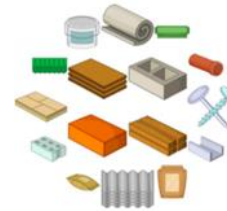
Key Facts and Dates

Reversible & Irreversible



- There are many ways in which materials can be changed. E.g. heating, cooling or mixing with other substances.
 - Some changes can be reversed (can be returned to its previous form). These are known as reversible changes. E.g. water freezing into ice - can be melted to become water again.
 - Other changes are irreversible, they cannot be 'undone'. E.g. cooking, baking, frying and burning materials. You can fry a raw egg to cook it but it can no longer return back into a raw egg.
 - Changes that involve the formation of new materials (e.g. mixing cement) are not normally reversible.

What you should already know...



- Materials are the substances that things are made from.
- The properties of materials make them useful for different purposes
- Materials have more than one property, they can be natural or man-made.
- There are 3 main states of matter - solids, liquids and gasses
- The state of matter of materials **can change** through processes such as freezing & melting

Grouping materials

Grouping Materials by Properties		
PROPERTY	YES	NO
ELECTRICAL CONDUCTOR	Copper, aluminum, gold, silver, steel, sea water	Glass, air, plastic, rubber, wood, oil, diamond
MAGNETIC	Steel, nickel, cobalt, iron, uranium, platinum	Paper, glass, plastic, rubber, wood, wool
TRANSPARENT	Glass, water, clear plastic	Wood, rubber, oil, steel, copper, iron, silver
WATERPROOF	Plastic, rubber, metal, glass	Tissue, sponge, fabric

Solutions & Separation

A solution is a specific type of mixture where one substance is dissolved into another.

- A solvent is a substance that dissolves a solid, liquid, or gaseous solute.
 - A solute is the substance dissolved in the solvent. When it dissolves, it looks as though it has disappeared, but in fact it has been broken down to become a part of the liquid.
 - One example of a solution is salt water. You cannot see the salt, and the solution will remain if left alone.
 - Some mixtures and solutions can be separated, e.g. through processes such as sieving, filtering and evaporating. Salt and water can be separated by evaporation.

Vocabulary

Materials

The substance that something is made out of e.g. wood, plastic, metal
 One of the 3 states of matter, particles are very close together so they hold their shape (wood/glass)

Liquids

This state of matter can flow and take the shape of the container. Particles are more loosely packed than solids and can move around each other (water/milk)

Gases

Another state of matter. Particles are further apart than solid or liquid and are free to move around (oxygen/helium)

Melting

The process of heating a solid until it changes to a liquid

Freezing

When a liquid cools and turns to a solid

Evaporating

When a liquid turns into a gas or vapour

Condensing

When gas, such as water vapour, cools and turns into a liquid.

Conductor

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

A material that does not let heat or electricity travel through them. Wood and plastic are both thermal and electrical insulators.

Transparency

Lets light through so the object can be looked through e.g. glass

Reversible Changes

Dissolving

Mixing



Changes of State

Burning



Rusting

Irreversible Changes

Decaying