

Big Ideas



Biology:

The cellular basis of life - **Heredity and life cycles** - **Variation, adaptation and evolution** - **Organisms and their environments** - Health and disease

Puberty is the change that happens in late childhood and adolescence where the body starts to change because of hormones.

Some changes include growth in height, more sweat, hair growth on arms and legs, under the armpits and on genitals, and growth in parts of the body such as male genitals and breasts.

Females begin to menstruate.

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.

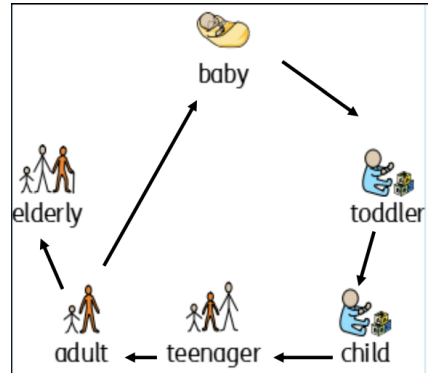
childhood - children learn new things as they grow. They become more independent.

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.



Vocabulary

circuit a complete route which an electric current can flow around

condensation small drops of water which form when water vapour or steam touches a cold surface, such as a window

conductor a substance that heat or electricity can pass through or along

dissolves when a substance is mixed with a liquid and the substance disappears

evaporation to turn from liquid into gas; pass away in the form of vapour.

filtering a device used to remove dirt or other solids from liquids or gases. A filter can be made of paper, charcoal, or other material with tiny holes in it.

insoluble impossible to dissolve, esp. in a given liquid.

insulator a non-conductor of electricity or heat
irreversible impossible to reverse, turn back, or change. **melting** to change from a solid to a liquid state through heat or pressure

particles a tiny amount or small piece

permeable of a substance, being such that gas or liquid can pass through it

process a series of actions used to produce something or reach a goal.

properties the ways in which an object behaves

rate the speed with which something happens

resistance the opposing power of one force against another.

reversible able to turn or change back

soluble able to be dissolved. solution a mixture that contains two or more substances combined evenly

state the structure or condition of something

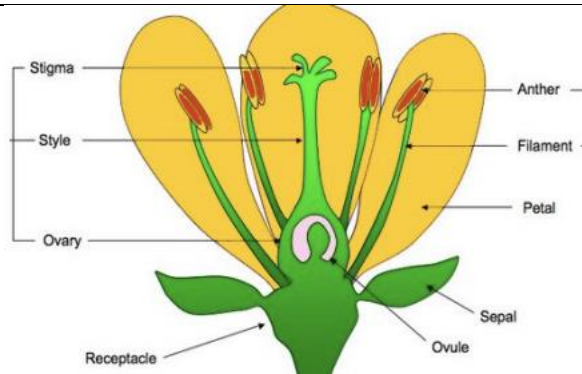
temperature a measure of how hot or cold something is

thermal relating to or caused by heat or by changes in temperature

transparent If an object is transparent, you can see through it

variable something that can change or that has no fixed value

water cycle the process by which water on the earth evaporates, then condenses in the



Reproduction is when an animal or plant produces one or more individuals similar to itself:

Sexual reproduction:

- requires two parents with male and female gametes (cells)
- will produce offspring that is similar to but not identical to the parent

Asexual reproduction:

- will produce offspring that is identical to the parent
- requires only one parent

Male gametes can be found in the pollen.

Female gametes can be found in the ovary (they are called ovules). Pollination occurs when pollen from the anther is transferred to the stigma by bees and other insects.

The pollen then travels down and meets the ovule. When this happens, seeds are formed - this is called fertilisation.

Seeds are then dispersed so that germination can begin again.

Some plants, such as daffodils and potatoes, can also produce offspring using asexual reproduction

The life cycles of mammals, birds, amphibians and insects have similarities and differences.

One difference is that amphibians and insects go through the process of metamorphosis. This is when the structure of their bodies changes significantly as they grow (for example, from tadpole to frog or caterpillar to butterfly).

atmosphere, and then returns to earth in the form of precipitation.

anther the part of a stamen that produces and releases the pollen

bulb a root shaped like an onion that grows into a flower or plant

cell the smallest part of an animal or plant that is able to function independently

dispersed scattered, separated, or spread through a large area

dissect to carefully cut something up in order to examine it scientifically

embryo an unborn animal or human being in the very early stages of development

fertilisation male and female gametes meet to form an embryo or seed

function a useful thing that something does

gamete the name for the two types of male and female cell that join together to make a new creature

germination if a seed germinates or if it is germinated, it starts to grow

metamorphosis a person or thing develops and changes into something completely different

ovary a female organ which produces eggs

ovule a small egg

pollination To pollinate a plant or tree means to fertilise it with pollen. This is often done by insects

reproduction when an animal or plant produces one or more individuals similar to itself

stigma the top of the centre part of a flower which takes in pollen

structure the way in which something is built or made

asteroid a rock that orbits the Sun in a belt between Mars and Jupiter

axis an imaginary line through the middle of something

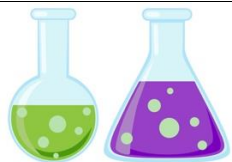
comet a bright object with a long tail that travels around the Sun

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

gravity the force which causes things to drop to the ground

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

meteorite a rock from outer space that has landed on Earth



Chemistry:

Substances and Properties - Particles and Structure - Chemical reactions - Earth's atmosphere - Dynamic earth

Materials which are good thermal conductors allow heat to move through them easily. Thermal conductors are used to make items that require heat to travel through them easily, such as a saucepan which requires heat to travel through to cook food. Thermal insulators do not let heat travel through them easily. Examples of thermal insulators include woollen clothes and flasks for hot drinks.



thermal insulator



thermal conductor

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.

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.

Materials that do not dissolve are insoluble.

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 (for insoluble materials), a sieve (based on the size of the solids) 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.

orbit the curved path in space that is followed by an object going round and round a planet, moon, or star

planet a large, round object in space that moves around a star

shadow a dark shape on a surface that is made when something stands between a light and the surface

Solar System the Sun and all the planets that go round it

sphere an object that is round in shape like a ball

spin turns quickly around a central point

star a large ball of burning gas in space

time zones one of the areas into which the world is divided where the time is calculated as being a particular number of hours behind or ahead of GMT (Greenwich Mean Time)

universe the whole of space and all the stars, planets, and other forms of matter and energy in it

adulthood the state of being an adult

development the gradual growth or formation of something

genitals the reproductive organs

gestation the process in which babies grow inside their mother's body before they are born

growth an increase in something

hormones a chemical, usually occurring naturally in your body, that makes an organ of your body do something

independent If someone is independent, they do not need help or money from anyone else.

infancy the period of your life when you are a very young child

life cycle the series of changes that an animal or plant passes through from the beginning of its life until its death

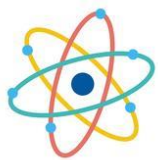
life processes There are seven processes that tell us that living things are alive

mature When a child or young animal matures, it becomes an adult

menopause the time during which a woman gradually stops menstruating, usually when she is about fifty years old

menstruation the approximately monthly discharge of blood by non-pregnant women from puberty to the menopause

offspring a person's children or an animal's young



Physics:

Matter - **Forces and motion** - Sound, light and Waves - **Electricity and Magnetism** - **Earth in space**

The Earth rotates on its axis anti-clockwise and makes a complete rotation over 24 hours (a day). This makes it appear as the Sun moves through the sky but the Earth's rotation causes day and night. Different parts of the Earth experience daylight at different times - this means that it is morning, afternoon and night in different places. This is also the reason why we have time zones. Because of the Earth's tilt, the poles experience 24 hours of sunlight in the summer, and very few hours of sunlight in the winter. As the Earth rotates, shadows that are formed change in size and orientation. The Earth takes 365 and a quarter days to orbit the Sun. Because of the extra quarter day it takes to orbit the Sun, every four years on Earth is a leap year! It is the Earth's tilt that causes the seasons. The Moon orbits the Earth anticlockwise and takes approximately 28 days. The Moon spins once on its axis every time it orbits Earth. This means that we only see one side of the Moon. The Moon has different phases depending on where it is in its orbit. The Moon's gravity causes high and low tides. There are 8 planets in our Solar System (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune). Pluto is a dwarf planet. They all orbit the Sun, which is a star, and they all have moons. 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 Solar System is in a galaxy called the Milky Way. The galaxy is in the universe.



organ a part of your body that has a particular purpose
puberty the stage in someone's life when their body starts to become physically mature
rapid A rapid change is one that happens very quickly
reproduction when an animal or plant produces one or more individuals similar to itself
toddler a young child who has only just learned to walk
vertebrate a creature which has a spine

Recall Quiz



Define 'Soluble' and 'Insoluble'. Give examples of materials that can be grouped into each category.

What are the potential uses for: wood, metal and plastic? Why are these materials suitable?

How could you separate and saltwater mixture?

What changes of state are/are not reversable?

What is the effect of gravity on objects? Are there any elements that gravity has a lesser/stronger effect?

What forces affect an aeroplane's ability to take-off, fly and land?

How could you lift a heavy object and lessen the effect of outside forces?
(prompt: making a mechanism to help)

How does air resistance effect a skydiver?

How do plants and animals receive the nutrients they need to survive?

Describe the lifecycle of an animal of your choice (including humans).

Why is it important to classify plants and animals?

Can you give me an example of plant classification?

Describe what is happening within our solar system.

How would you describe the Earth and the Moon?

Why do we have day and night?

Why do we get different time-zones?

Teaching resources:

Animals including humans:

<https://pstt.org.uk/resources/curriculum-materials/assessment> (click 'Focussed Assessment Plans)
<https://explorify.wellcome.ac.uk/en/activities/what-if/we-could-bring-back-woolly-mammoths>
<https://www.stem.org.uk/resources/community/collection/13293/year-5-animals-including-humans>

Earth and space:

<https://pstt.org.uk/resources/curriculum-materials/assessment> (click 'Focussed Assessment Plans)
<https://explorify.wellcome.ac.uk/en/activities/mission-survive/crewed-mission-to-mars>
<https://www.stem.org.uk/resources/community/collection/12347/year-5-earth-and-space>

Living things and their habitats:

<https://pstt.org.uk/resources/curriculum-materials/assessment> (click 'Focussed Assessment Plans)
<https://explorify.wellcome.ac.uk/en/activities/what-if/no-one-cleaned-the-house>
<https://www.stem.org.uk/resources/community/collection/12775/year-5-living-things-and-their-habitats>

Properties and changes in materials:

<https://pstt.org.uk/resources/curriculum-materials/assessment> (click 'Focussed Assessment Plans)
<https://explorify.wellcome.ac.uk/en/activities/mystery-bag/electrifying-metals>
<https://www.stem.org.uk/resources/community/collection/12742/year-5-properties-materials>