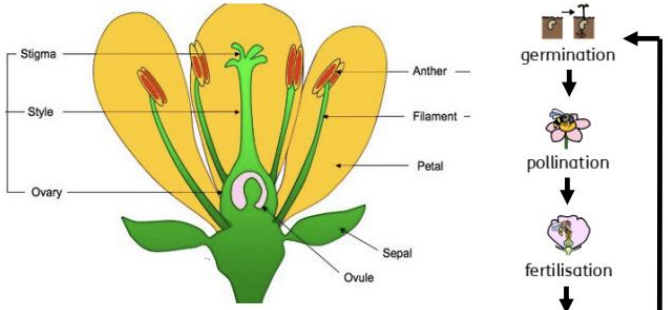
Midsomer Norton Schools Partnership

Big Ideas in Science - What I need to know by the end of Y3 (Y4 revision)

Big Ideas

Biology:

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



The petals on a flower are usually bright - this is to attract bees and other insects so that they can collect pollen to make seeds.
The seeds are then able to grow to make new plants. This is called germination.
Leaves use carbon dioxide and sunlight to make food for the plant.
The stem carries water and other nutrients from the roots to the rest of the plant. Leaves use this water to make food.

Water is absorbed from the soil by the roots.
It is then transported from the roots to the stem and then to the rest of the plant.

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.

Vocabulary

backbone - the column of small linked bones down the middle of your back . Also known as a spine.
bones - the hard parts inside your body which form your skeleton
contract - to make smaller by drawing together; shrink or make tighter.
elbow - the bend or joint between the upper arm and the lower arm
endoskeleton - the internal skeleton of an animal, especially the bony skeleton of vertebrates
exoskeleton - the protective or supporting structure covering the outside of the body of many animals
joints - the junction between two or more bones
muscles - something inside your body which connects two bones and which you use when you make a movement
organs - a part of your body that has a particular purpose
skeleton - the framework of bones in your body
support - to hold something up
tendons - a strong cord in a person's or animal's body which joins a muscle to a bone
vertebrate - a creature which has a spine
bedrock - the solid rock in the ground which supports all the soil above it
decaying - gradually being destroyed by a natural process
grain - A grain of something such as sand or salt is a tiny hard piece of it
imprint - a mark or outline made by the pressure of one object on another
leaf litter - decaying leaves
magma - molten rock that is formed in very hot conditions inside the earth
mineral - something that is formed naturally in rocks and in the earth.
molten - Molten rock, metal, or glass has been heated to a very high temperature and has become a hot, thick liquid
palaeontology - the study of fossils as a guide to the history of life on Earth

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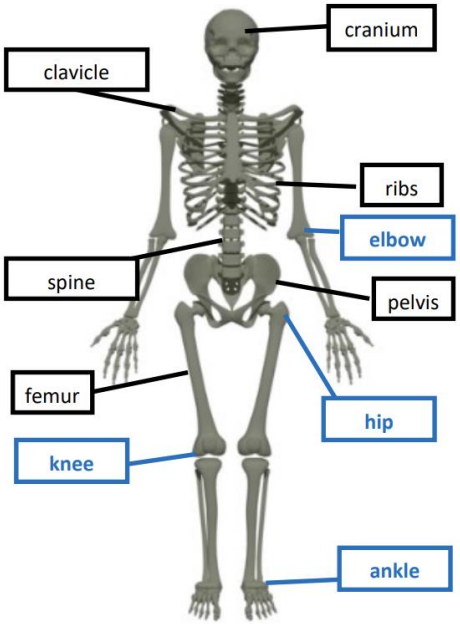

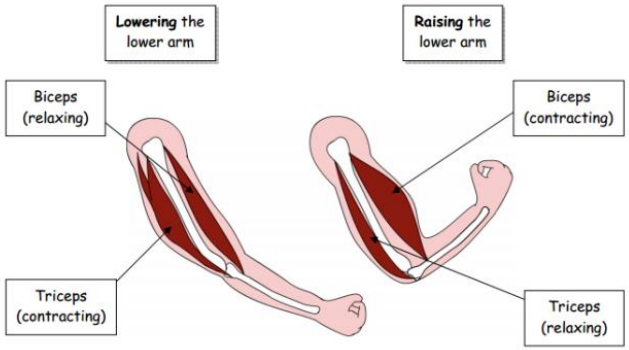

Joints are where bones meet - they allow our bodies to move.
Muscles contract and relax.
The three most important things a skeleton does are:
•provide support and shape to an animal's body
• allow movement through the joints
• protect organs (e.g. the skull protects the brain)

permeable - if a substance is permeable, something such as water or gas can pass through it or soak into it.
porous - Something that is porous has many small holes in it, which water and air can pass through
prehistoric - the time in history before any information was written down
sediment - solid material that settles at the bottom of a liquid, especially earth and pieces of rock that have been carried along and then left somewhere by water, ice, or wind
volcano - a mountain from which hot melted rock, gas, steam, and ash from inside the Earth sometimes burst.
weathered - affected by the weather
absorb - soak up or take in
anther - the part of a stamen that produces and releases the pollen
carbon dioxide - a gas produced by animals and people breathing out
climate zone - sections of the Earth that are divided according to the climate. There are three main climate zones; polar, temperate and tropical. **dispersed** - scattered, separated, or spread through a large area
dissect - to carefully cut something up in order to examine it scientifically
fertilisation - in plants, where pollen meets the ovule to form a seed
fertiliser - a substance that is added to soil in order to make plants grow more successfully
germination - if a seed germinates or if it is germinated, it starts to grow
life cycle - the series of changes that an animal or plant passes through from the beginning of its life until its death
ovule - a small egg petal thin coloured or white parts which form part of the flower
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
stigma - the top of the centre part of a flower which takes in pollen
transported - taking something from one place to another

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Chemistry:

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

There are three types of rocks that are formed naturally.

Igneous:

- When molten magma cools, igneous rocks are formed.
- This either cools and forms rocks under the earth's surface, or flows out of erupting volcanoes as lava and may mix with other minerals.
- Examples include granite and basalt.
- This type of rock is strong, hardwearing and non-porous.

Sedimentary:

- Sometimes, little pieces of rocks that have been weathered can be found at the bottom of lakes, seas and rivers This is called sediment.
- Over millions of years, layers of this sediment builds up forming sedimentary rocks.
- Examples include limestone and chalk.
- Sedimentary rocks are porous and can easily be worn down .

Metamorphic:

- When some igneous and sedimentary rocks are heated and squeezed (pressured), they form metamorphic rocks.
- Examples include slate and marble.
- Metamorphic rocks are strong

angle - the direction from which you look at something
chemical reactions - a process that involves changes in the structure of something
dim - light that is not bright
electricity - a form of energy that can be carried by wires and is used for heating and lighting, and to provide power for machines
emits - to emit a sound or light means to produce it
mirror - a flat piece of glass which reflects light, so that when you look at it you can see yourself reflected in it
opaque - if an object or substance is opaque, you cannot see through it
reflects - sent back from the surface and not pass through it
shadows - a dark shape on a surface that is made when something stands between a light and the surface
source - where something comes from
surface - the flat top part of something or the outside of it
torches - a small electric light which is powered by batteries and which you can carry
translucent - if a material is translucent, some light can pass through it
transparent - If an object or substance is transparent, you can see through it
attract - If one object attracts another object, it causes the second object to move towards it
friction - the resistance of motion when there is contact between two surfaces
force - the pulling or pushing effect that something has on something else
gravity - the force which causes things to drop to the ground
magnet - a piece of iron or other material which attracts magnetic materials towards it
magnetic field - an area around a magnet, or something functioning as a magnet, in which the magnet's power to attract things is felt
motion - the activity of changing position or moving from one place to another
nonmagnetic - an object that is not magnetic opposite
position - The position of someone or something is the place where they are in relation to other things

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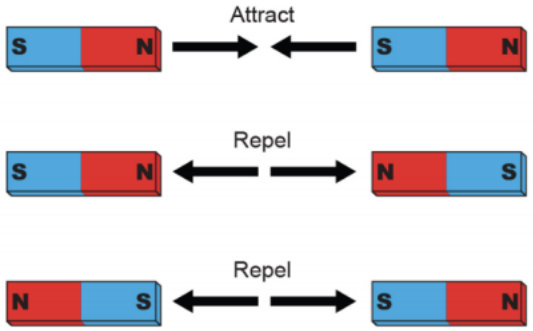
Physics:

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



The ends of a magnet are called poles.
One end is called the north pole and the other end is called the south pole.
Magnets produce an area of force around them called a magnetic field.
When objects enter this magnetic field, they will be attracted to or repelled from the magnet if they are magnetic.
When magnets repel, the push each other away
When magnets attract, they pull together
Forces act in opposite directions to each other.
When an object moves across a surface, friction acts as an opposite force.
Friction is a force that holds back the motion of an object.
Forces are pushes and pulls.
These forces change the motion of an object.
They will make it start to move or speed up, slow it down or even make it stop.

When light is blocked by an opaque object, a dark shadow is formed. An opaque material blocks light so we can't see through it and shine a light through it. When light is shone onto a transparent object, the light travels through it, we can see through it and it makes a very faint shadow.

resistance - a force which slows down a moving object or vehicle
surface - the flat top part of something or the outside of it

Recall Quiz

How do we see different colours?

What causes a shadow? How do you know this?

Why can humans not see well in the dark?

Why is it important to protect our eyes from the sun? How can we do this?

Describe a balanced diet? Why is nutrition important?

Describe a food chain. What is the predator and what is the prey?

What is an invertebrate?

How does a human eat and digest food?

Describe the structure of a plant. What is the purpose of each part?

How is water transported throughout a plant?

What is the lifecycle of a plant?

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When light is shone onto a translucent object, some of the light travels through it, we can see bright light sources through it, and it makes a fairly dark shadow. The size of a shadow changes as the light source moves. The further away the light source is, the smaller the shadow is. The closer the source of the light, the bigger the shadow. The Moon is not a source of light even though we can see it in the dark. This is because the Sun's light reflects on the surface of the Moon making it appear as though the Moon emits light. Shiny things are not light sources - they appear to be sources of light as they are bright. Light travels in straight lines. When light is blocked by an opaque object, a dark shadow is formed.	How does a plant grow? What different categories of rocks are there? How is a sedimentary rock created? What are the properties of an igneous rock? How is a fossil formed? What would stop an object in motion from moving? Why? What materials are/are not attracted to magnets? What happens to magnets when they are close to other magnets? What are 'poles'?

Teaching resources:

Animals including humans (muscles and skeletons):

https://pstt.org.uk/resources/curriculum-materials/assessment (click 'Focussed Assessment Plans)
https://explorify.wellcome.ac.uk/en/activities/what-if/my-bones-were-bendy
https://www.stem.org.uk/resources/community/collection/12601/year-3-animals-including-humans

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Forces and Magnets:

https://pstt.org.uk/resources/curriculum-materials/assessment (click 'Focussed Assessment Plans)
https://explorify.wellcome.ac.uk/en/activities/odd-one-out/pull-together
https://www.stem.org.uk/resources/community/collection/12391/year-3-forces-and-magnets

Plants:

https://pstt.org.uk/resources/curriculum-materials/assessment (click 'Focussed Assessment Plans)
https://explorify.wellcome.ac.uk/en/activities/whats-going-on/water-colours
https://www.stem.org.uk/resources/community/collection/12535/year-3-plants

Light:

https://pstt.org.uk/resources/curriculum-materials/assessment (click 'Focussed Assessment Plans)
https://explorify.wellcome.ac.uk/en/activities/whats-going-on/shadow-shapes
https://www.stem.org.uk/resources/community/collection/12719/year-3-light

Rocks:

https://pstt.org.uk/resources/curriculum-materials/assessment (click 'Focussed Assessment Plans)
https://explorify.wellcome.ac.uk/en/activities/the-big-question/do-rocks-stay-the-same-forever
https://www.stem.org.uk/resources/community/collection/12367/year-3-rocks