

Previous knowledge.

- Can notice that animals, including humans, have offspring which grow into adults
- Research and describe the basic needs of animals, including humans, for survival (water, food, air)
- Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene

Science Knowledge Organiser – Year 3 Biology:
Animals including humans



What I will learn in this unit.

- I will be able to identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat
- I will be able to identify that humans and some other animals have skeletons and muscles for support, protection and movement.

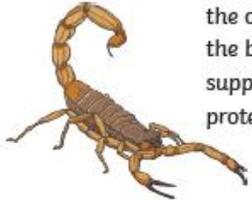
vertebrate

endoskeleton – a skeleton on the inside of the body that supports and protects it



invertebrate

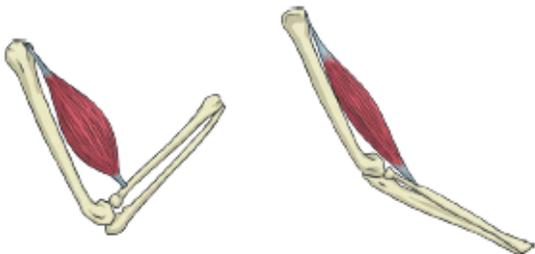
exoskeleton – a skeleton on the outside of the body that supports and protects it



hydrostatic skeleton – a skeleton made up of a fluid-filled compartment in the body called a coelom, mainly found in soft-bodied animals



Skeletal **muscles** work in pairs to move the bones they are attached to by taking turns to contract (get shorter) and relax (get longer).

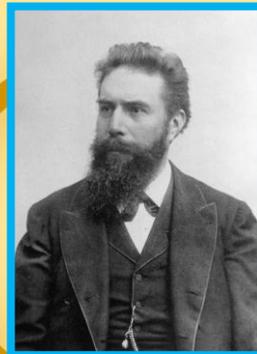


contract

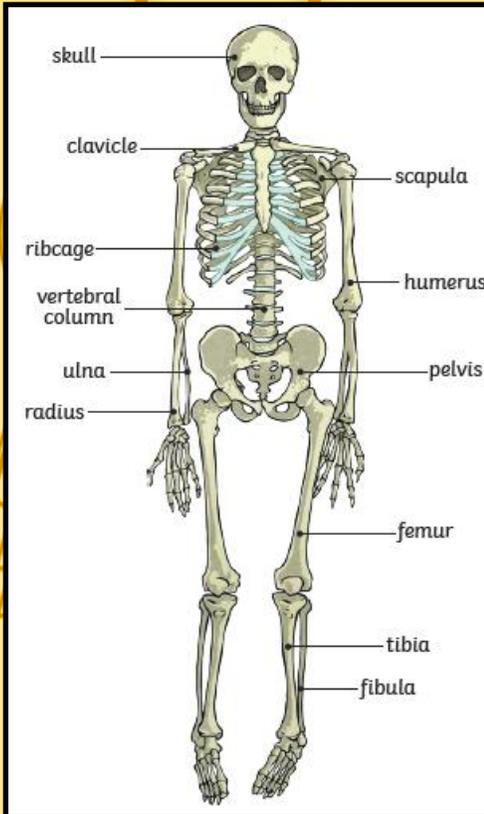
relax

Scientist study:
Wilhelm Rontgen (1845 - Germany)

He was the first one to produce and detect electromagnetic radiation in a wavelength. These rays are now known as x-rays or Rontgen rays.



Word	Definition
Nutrients	Substances that help to keep living things alive
Skeleton	Skeletons protect the organs, allow movement and support the body
Hinge	A joint that bends in one way, elbow and knee and two examples
Socket and ball	A hip or shoulder joint that can twist and turn
Muscles	Soft tissue in the body that contracts and relaxes to cause movement of the skeleton
Vertebrates	An animal with a backbone
Invertebrate	An animal without a backbone
Exoskeleton	A skeleton on the outside of the body
Endoskeleton	A skeleton on the inside of the body
Hydrostatic skeleton	A skeleton made up of fluid
Carbohydrates	Food that provided energy
Fats	Food that provided energy but too much can be unhealthy
Proteins	Food that helps muscle grow and repair
Vitamins and minerals	In fruits and vegetables that keep you healthy
Fibre	Food that helps you digest and go to the toilet
Dairy	A food that comes originally from milk

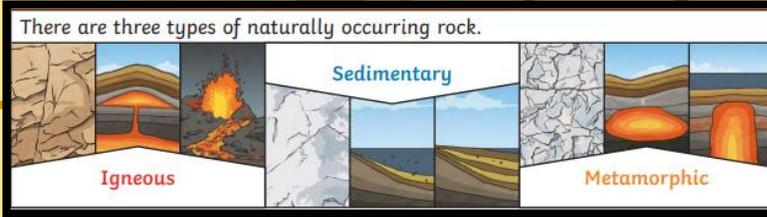


Previous knowledge.

- Identify and compare the suitability of a variety of everyday materials, for particular uses.

Science Knowledge Organiser – Year 3

Chemistry: Rocks and Soils



What I will learn in this unit.

- Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties
- Describe in simple terms how fossils are formed
- Recognise that soils are made from rocks and organic matter

Natural Rocks			Human-Made Rocks
Igneous	Sedimentary	Metamorphic	
Obsidian 	Chalk 	Marble 	Brick
Granite 	Sandstone 	Quartzite 	Concrete
Basalt 	Limestone 	Slate 	Coade Stone

Fossils

There are two main types of fossil:

Body fossils are the fossilised remains of a plant or animal

Trace fossils are fossilised records of an animal's behaviour, for example a footprint.

How are fossils made?

- An animal skeleton or trace is buried under small particles of rock, called sediment.
- As more layers of sediment build up on top, the sediment around the object begins to compact and turn to rock.
- As water seeps through the sedimentary rock, any bones or organic matter are dissolved gradually.
- Minerals in the water replace the bone or organic matter, leaving a rock replica of the original. This is called a fossil.
- Weathering and erosion may eventually expose the fossil

Scientist study: Mary Anning (1799 - England)

Mary Anning was a fossil collector, dealer, and palaeontologist who became known around the world for the discoveries she made in Jurassic marine fossil beds in the cliffs along the English Channel at Lyme Regis in the county of Dorset in Southwest England. Her most important find, from a scientific point of view, was her discovery of **the first plesiosaur**. She is remembered because she was a woman and born in 1799 when it was unusual for women to be scientists.



Soil

Soil is the uppermost layer of the Earth. It is a mixture of different things:

- minerals (the minerals in soil come from finely broken-down rock);
- air;
- water;
- organic matter (including living and dead plants and animals).

Word	Definition
fossils	Preserved remains, impression, or trace of any once-living thing
organic matter	Organic matter is anything that contains carbon compounds that were formed by living organisms that once lived
erosion	When water, wind or ice wears land away
sedimentary	Rock that is formed by layers of sediment being pressed down and sticking together
metamorphic	Rock that starts as igneous or sedimentary rock and changes due to extreme heat of pressure
igneous	Rock that is formed (made) from magma or lava
magma	Molten rock under the ground
lava	Molten rock that comes out of the ground
sediment	Natural solid material moved and dropped in a new place by water or wind (sand)

Previous knowledge.

- To be able to identify and compare a variety of everyday materials

Science Knowledge Organiser – Year 3

Physics: Forces and magnets

What I will learn in this unit.

- To be able to compare how things, move on different surfaces
- To be able to notice that some forces need contact between two objects, but magnetic forces can act at a distance
- To be able to observe how magnets, attract or repel each other and attract some materials and not others
- To be able to compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet and identify some magnetic materials
- To be able to describe magnets as having two poles
- To be able to predict whether two magnets will attract or repel each other

Like **poles** **repel**.
Opposite **poles** **attract**.

A **magnetic field** is invisible. You can see the **magnetic field** here though. This is what happens when iron filings are placed on top of a piece of paper with a **magnet** underneath.

The needle in a compass is a **magnet**. A compass always points north-south on Earth.

Word	Definition
magnetic field	The area around a magnet where there is a magnetic force
north and south pole	The North and South poles are found at different ends of a magnet
repel	Repulsion is a force that pushes objects away
attract	Attraction is a force that pulls objects together
force	A pull or a push
magnetism	Where objects are attracted to magnets, objects with iron, nickel and cobalt metals are magnetic

Scientist study: Isaac Newton (1643 - England)

Sir Isaac Newton made many important scientific discoveries, but his most famous one is his theory of gravity. He realised that earth must have a force that pulls objects downwards rather than letting them float upwards. Also, he discovered that gravity pulls objects towards each other. The bigger an object is, then the more gravity it has. He then used this theory about gravity to explain that gravity keeps the moon orbiting around the earth.



Different **surfaces** create different amounts of **friction**. The amount of **friction** created by an object moving over a **surface** depends on the roughness of the **surface** and the object, and the **force** between them.

The **driving force** pushes the bicycle, making it move.

Friction pushes on the bicycle, slowing it down.

Grass Gravel Sand Road

Previous knowledge.

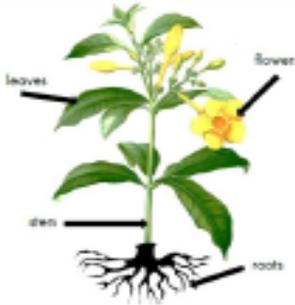
- To be able to observe and describe how seeds and bulbs grow into mature plants.
- To be able to investigate how plants need water, light and a suitable temperature to grow and stay healthy

Science Knowledge Organiser –
Year 3 Biology: Plants



What are the different parts of a plant and what are their functions?

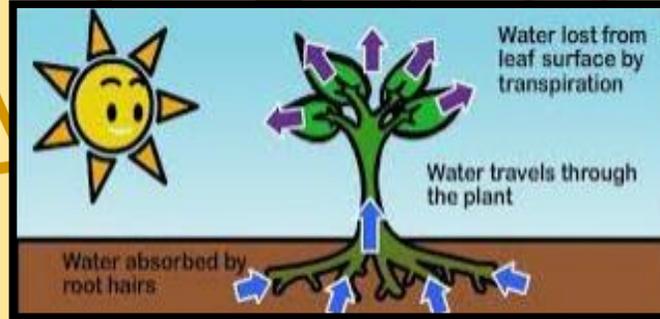
FLOWERS: The flowers are often brightly coloured and smell to attract insects. Insects help with the plants reproduction through pollination.



LEAVES: The leaves use light from the sun, along with carbon dioxide from the air and water to make food for the plant. This process is called photosynthesis.

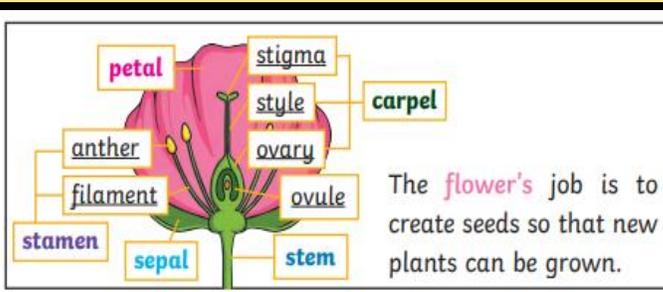
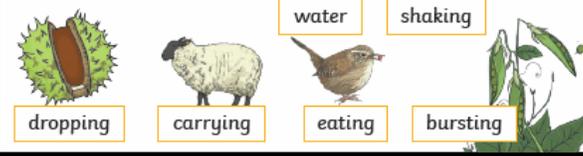
STEM / TRUNK: The stem carries water and nutrients to different parts of the plant. They keep the plant upright.

ROOTS: The roots of a plant take up water and nutrients from the soil. The roots also keep the plant steady and upright in the soil; they "anchor" the plant.



Seed Dispersal

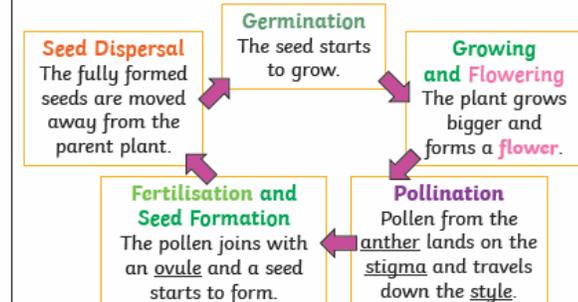
Seeds can be dispersed by:



What I will learn in this unit.

- I can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
- I can explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant
- I can investigate the way in which water is transported within plants
- I can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Life Cycle of a Flowering Plant



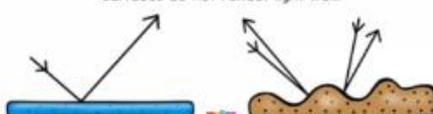
Word	Definition
nutrients	What is needed by living things to survive
Transportation	How water is moved through a plant
Pollination	When pollen is moved from the male another to the female stigma
Dispersal	A method of moving seeds away from the parent plant
photosynthesis	The process of a plant making its own food

Scientist study: Joseph Banks. (1743 - England)

He was an English [naturalist](#), [botanist](#) and patron of the natural sciences. Banks took part in [Captain James Cook](#)'s first great voyage from 1768 to 1771. Banks discovered and collected [Eucalyptus](#), [Acacia](#), [Mimosa](#), and [Banksia](#). About 80 [species](#) of plants are named after Banks. His collections were given to the [British Museum](#).

Reflection

When a beam of light is reflected from a surface, it changes direction. Smooth, shiny surfaces such as polished metals reflect light well. Rough and dark surfaces do not reflect light well.



What I will learn in this unit.

- I can recognise that they need light in order to see things and that dark is the absence of light
- I can notice that light is reflected from surfaces
- I can recognise that light from the sun can be dangerous and that there are ways to protect their eyes
- I can recognise that shadows are formed when the light from a light source is blocked by a solid object
- I can find patterns in the way that the size of shadows change.

Word	Definition
reflection	When light bounces off a surface
shadow	An area of darkness produced by an object
light source	An object which emits (gives) light
emit	To produce or give
opaque	When an object does not let light through
translucent	When an object lets some light through
transparent	When an object lets light through



We must never look directly at the Sun as the light produced is very bright and can be harmful to our eyes. This is why we wear sunglasses.

Scientist study: Ibn al-Haytham

(965 - Iraq)
He wrote at least 96 books. His most famous is the *Book of Optics* or *Kitab al-Manazir* which was translated into Latin and became very influential. He studied what the eyes are made of and names the important parts.

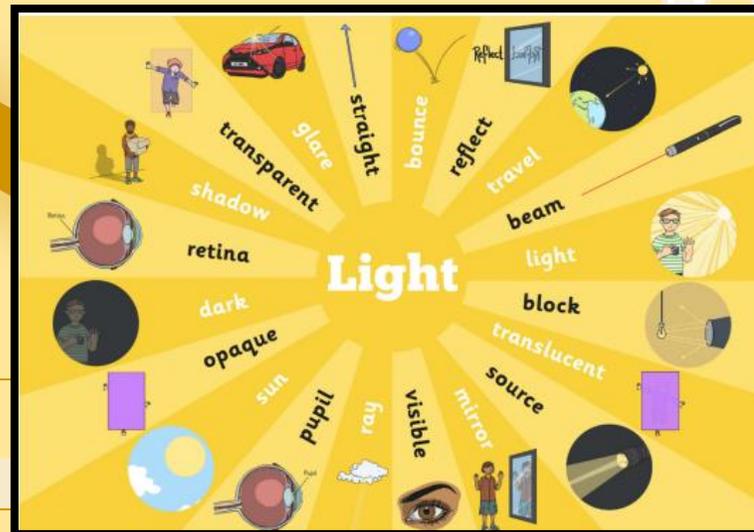
You can change the size and shape of shadows by placing the light source further away or closer to the object.



LARGE SHADOW when the toy is close to the light

SMALLER SHADOW when the toy is further from the light

TINY SHADOW when the toy is a long way from the light



We need **light** to be able to see things. **Light** travels in a straight line. When **light** hits an object, it is **reflected** (bounces off). If the **reflected light** hits our eyes, we can see the object. Some surfaces and materials **reflect light** well. Other materials do not **reflect light** well. **Reflective** surfaces and materials can be very useful...

