

**What should I already know?**

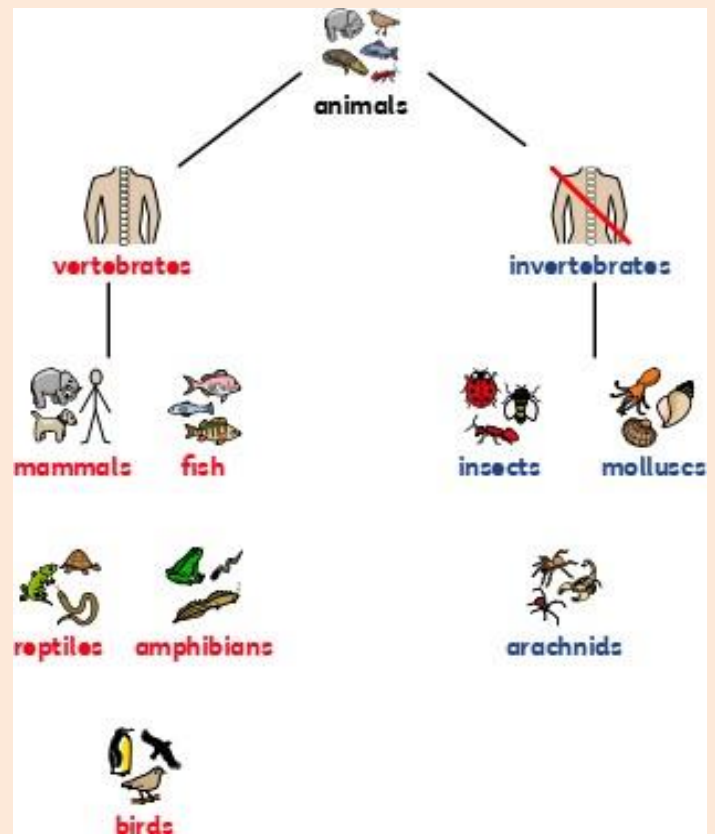
- The names of some common animals.
- The parts of the human body and how they are associated with each sense.

**What will I know by the end of the unit?**

What are vertebrates?	<p><b>Vertebrates</b> are animals that have a <b>backbone</b>.</p> <p>There are five groups of <b>vertebrates</b>:</p> <ul style="list-style-type: none"> <li>• mammals</li> <li>• fish</li> <li>• birds</li> <li>• reptiles</li> <li>• amphibians</li> </ul>
What are mammals?	<ul style="list-style-type: none"> <li>• give birth to live young</li> <li>• usually have hair or fur</li> <li>• warm-blooded</li> <li>• cannot breathe underwater</li> <li>• some common mammals are:                             <ul style="list-style-type: none"> <li>• pets such as dogs, cats, hamsters</li> <li>• farm animals such as cows, sheep and horses</li> <li>• wild animals such as foxes, hedgehogs, lions and giraffes</li> <li>• humans</li> </ul> </li> </ul>
What are fish?	<ul style="list-style-type: none"> <li>• have fins and scales</li> <li>• breathe underwater using <b>gills</b></li> <li>• lay eggs in water</li> <li>• <b>cold-blooded</b></li> <li>• some common fish are salmon, cod and tuna</li> </ul>
What are birds?	<ul style="list-style-type: none"> <li>• <b>warm-blooded</b></li> <li>• have wings and beaks</li> <li>• have feathers</li> <li>• lay eggs</li> <li>• some common birds are ducks, chickens, penguins and pigeons</li> </ul>
What are reptiles?	<ul style="list-style-type: none"> <li>• <b>cold-blooded</b></li> <li>• lay eggs</li> <li>• have scales</li> <li>• cannot breathe underwater</li> <li>• some common reptiles are snakes and lizards</li> </ul>

**Investigate**

- use observations in the local environment to compare animals or through videos and photographs
- describe how to identify and group animals
- group animals according to what they eat
- research how to take care of animals taken from the local **environment** and how to return them safely



Vocabulary	
backbone	the column of small linked bones down the middle of your back
carnivores	an animal that eats meat
cold-blooded	a body temperature that changes according to the surrounding temperature
environment	all the circumstances, people, things, and events around them that influence their life
farm	an area of land used to produce crops or to breed animals and livestock
gills	the organs on the sides of fish and other water creatures through which they breathe
herbivore	an animal that only eats plants
invertebrate	a creature that does not have a spine, for example an insect, a worm, or an octopus
omnivore	person or animal eats all kinds of food, including both meat and plants
pet	a tame animal kept in a household
temperature	a measure of how hot or cold something is
vertebrate	a creature which has a spine
warm-blooded	a fairly high body temperature which does not change much and is not affected by the surrounding temperature
wild	animals or plants that live or grow in natural surroundings and are not looked after by people
backbone	the column of small linked bones down the middle of your back

## What should I already know?

- Objects feel and look different based on the material they are made from.
- Use different materials when painting and making art.

## What will I know by the end of the unit?

Which materials are some objects made from



What words can I use to describe materials?



Which materials are natural?



Which materials are man-made?



Vocabulary	
absorbent	material that soaks up liquid easily
bendy	an object that bends easily into a curved shape
brick	rectangular blocks of baked clay used for building walls, which are usually red or brown
dull	a colour or light that is not bright
elastic	a rubber material that stretches when you pull it and returns to its original size and shape when you let it go
fabrics	cloth or other material produced by weaving together cotton, wool or other threads.
foil	sheets of metal as thin as paper
glass	a hard transparent material
man-made	things are created by people
metal	a hard substance such as iron, steel, gold, or lead
natural	things that exist in nature and are not made by people
opaque	if an object or substance is opaque, you cannot see through it
plastic	a material which is light in weight and does not break easily
rock	the hard substance which the Earth is made of
rough	uneven and not smooth

## Investigate

- How are objects similar / different based on the materials they are made from?
- How are materials similar / different to each other?
- Can you sort natural materials from man-made materials?
- What is the best material for an umbrella?
- What is the best material for a lining a dog basket?
- What is the best material for a bookshelf?

## What should I already know?

- Objects feel and look different based on the material they are made from.
- Use different materials when painting and making art.

## What will I know by the end of the unit?

The names of some common garden plants

- People may grow **plants** in their **gardens** and care for them.
- They may grow **flowering plants** which are beautiful to look at or **beans and seeds** to grow **plants** for food.
- When **plants** are grown for food, this may be called a **herb garden** or **vegetable patch**.



vegetable patch



poppy



sunflower

The names of some common wild plants

- A **wild plant** will grow by itself.
- It does not need to be cared for.
- If it grows somewhere unwanted, it may be a **weed**.



dandelion



nettle

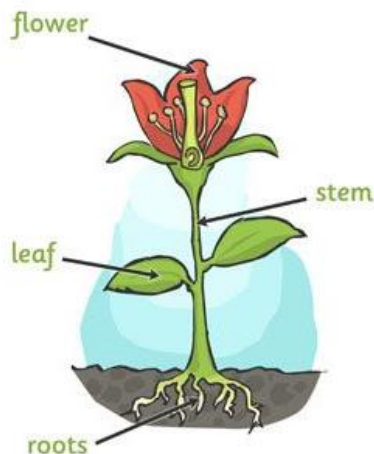


clover

**Deciduous** and **evergreen trees**

- Deciduous trees lose their leaves in the autumn every year. Their leaves are generally broad, flat and have veins running through them.
- Evergreen trees have green leaves all year round. Their leaves are generally thick, waxy and narrow like needles.

What are the parts of common trees and plants?



## Investigate

- Plant a bean or a seed and watch it grow. Record your observations in a diary.
- Go on a wild plant hunt! Create a tally chart to show how many of each plant you have found and then use the information to answer questions.
- Plant some garden plants, care for them and watch them grow.
- Go on a tree hunt around a Country Park - what types of trees can you see? Collect fallen leaves and identify which tree they came from using pictures to help you. Sort the leaves between deciduous and evergreen trees.
- Label the parts of a plant showing where the leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, and stems are.

## Vocabulary

branches	parts that grow out from the tree trunk and have leaves, flowers, or fruit growing on them
bulb	a root shaped like an onion that grows into a flower or plant
common	something that is found in large numbers or it happens often
deciduous	a tree that loses its leaves in the autumn every year
evergreen	a tree or bush which has green leaves all the year round
flower	the part of a plant which is often brightly coloured and grows at the end of a stem
flowering	trees or plants which produce flowers
fruit	something which grows on a tree or bush and which contains seeds or a stone covered by a substance that you can eat
garden	a piece of land next to a house, with flowers, vegetables, other plants, and often grass
herb	a plant whose leaves are used in cooking to add flavour to food, or as a medicine
leaf / leaves	the parts of a tree or plant that are flat, thin, and usually green
petal	thin coloured or white parts which form part of the flower
plant	a living thing that grows in the earth and has a stem, leaves, and roots
roots	the parts of a plant that grow under the ground
seed	the small, hard part from which a new plant grows

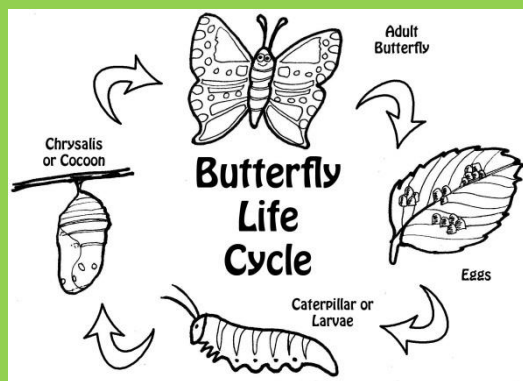
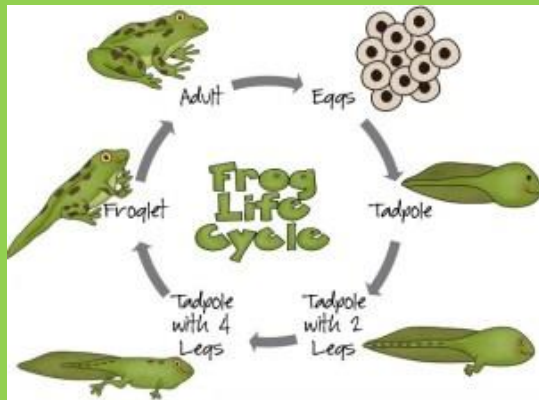
**What should I already know?**

- There are five types of **vertebrates** (mammals, fish, reptiles, amphibians, birds)
- **Vertebrates** are animals that have a **backbone**.
- Some animals are suitable to be kept as pets but others are not.
- Some animals give birth to live young but others lay eggs.
- Doctors and nurses give us **medicine** when we are poorly.

**What will I know by the end of the unit?**

What is a **life cycle**?

- A **life cycle** is the series of changes that an animal or plant passes through from the beginning of its life until its death.
- Animals, including humans, have **offspring** which grow into adults.



What do all animals need to **survive**?

All animals need water, air and food to **survive**.


What do humans need to be **healthy**?

- To keep **healthy**, humans need:
- to eat a **balanced diet** and **healthy food**
  - some **exercise** to keep their **muscles** and **bones healthy**
  - to take **medicines** that are given by doctors and nurses when feeling poorly
  - to keep good **hygiene** by washing regularly, having clean clothes, brushing teeth and hair.

Investigate

- Match animals to their **offspring**
- Compare and contrast **offspring** to their parents.
- Compare the heights/hand spans of people at different stages of their lives.
- Order the stages in human life.
- Write an instruction text about how to look after **pets**.
- Investigate how animals are cared for in **zoos** and **farms**.
- Research animal charities, such as the RSPCA, and how they keep animals safe.
- Record a food diary and evaluate your diet.
- Collect information about favourite foods and present it in a **pictogram** or **bar chart**.
- Participate in a series of **exercises** and investigate how each **exercise**:
  - makes your body feel
  - affects your breathing
  - uses each of your **muscles**

Vocabulary

backbone	the column of small linked bones down the middle of your back
balanced diet	a variety of food that you regularly eat
bar chart	a chart which uses bars to represent the value of something and comparing it to a different group  bar chart
bones	the hard parts inside your body which form your skeleton
disease	an illness which affects people, animals, or plants
exercise	When you exercise, you move your body energetically in order to get fit and to remain healthy
farm	an area of land used to produce crops or to breed animals and livestock
healthy	well and not suffering from any illness
hygiene	keeping yourself and your surroundings clean, especially in order to prevent illness or the spread of diseases
life cycle	the series of changes that an animal or plant passes through from the beginning of its life until its death
medicine	the treatment of illness and injuries by doctors and nurses
muscles	something inside your body which connects two bones and which you use when you make a movement
offspring	a person's children or an animal's young
pet	a tame animal kept in a household

### What should I already know?

- Which things are living, dead and things which have never been alive.
- The names of some common **plants** and types of **trees**.
- Some animals are suitable to be kept as pets but others are not. All animals need water, air and food to **survive**
- Animals can be grouped into **vertebrates** and **invertebrates** Animals can be grouped into **carnivores**, **herbivores** and **omnivores**
- Animals, including humans, have **offspring** which grow into adults.

### What will I know by the end of the unit?

What is a habitat?

A **habitat** is a place where living things, such as animals and **plants**, can find all of the things they need to **survive**. This includes food, water, air, space to move and grow and some shelter.

Some **habitats** are large, like the ocean, and some are very small, such as under a log.

Some **habitats** in our local area include the river and woodlands. Other habitats include the coast and the forest.



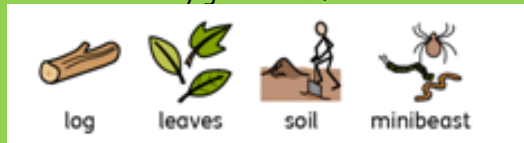
What is a micro-habitat?

**Microhabitats** are very small **habitats** where **minibeasts** may live.

Examples of **microhabitats** include under stones, in grass, under fallen leaves and in the soil.

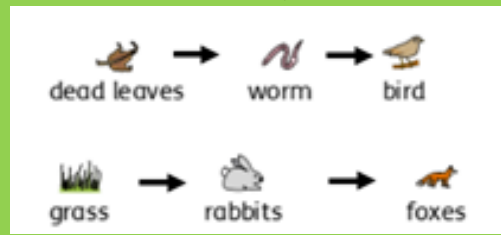
**Minibeasts** that can be found there include worms, snails, ants, centipedes, millipedes, and butterflies and they help to keep the **microhabitat** healthy.

**Minibeasts** are able to **survive** in their **habitats** because they can find the things they need to **survive** there, such as food and water. For example, caterpillars can **survive** on leaves as they give them food



How do animals and plants depend on each other?

- Animals and **plants** depend on each other to **survive**. For example, worms **depend** on **plants** because they feed on dead leaves, but **plants** depend on worms who make the soil healthy by digging holes and allowing air in.
- Birds also need worms because they eat them. Worms are a **source** of food for birds.
- This called a **food chain**.
- If there were no worms, there would be less birds as there would be more competition for food. The soil would not be as healthy without worms.
- All living things (or things that were once living) have a part to play in **food chains**. Without them, other animals and **plants** may not be able to survive.



### Investigate

- Compare two different habitats and explain what animals and plants can be found there.
- Go on a minibeast hunt. What minibeasts can you find? Why can they survive in their habitat? Create a tally chart or pictogram to show your results.
- Compare two different microhabitats. What do you notice about the minibeasts that live in each one? Why do you think that is? Discuss how the minibeasts help keep the microhabitat healthy.
- Use your knowledge of biomes to describe the types of animals and plants that live there. Match animals and plants to their habitats (e.g. forest, ocean, poles, desert).
- Answer questions such as 'Why would a polar bear not survive in the desert?'
- Create simple food chains that begin with a plant. Discuss what would happen if one of those living things in a food chain did not exist.

Vocabulary	
biomes	a natural area of <b>vegetation</b> and animals
carnivore	an animal that eats meat
depend	If you <b>depend</b> on someone or something, you need them in order to be able to survive physically
food chain	a series of living things which are linked to each other because each thing feeds on the one next to it in the series
habitat	the natural environment in which an animal or <b>plant</b> normally lives or grows
herbivore	an animal that only eats plants
invertebrate	a creature that does not have a spine, for example an insect, a worm, or an octopus

## What should I already know?

- **Plants** can grow.
- The names of some **common garden plants** (e.g. poppy, rose) and the names of some **common wild plants** (e.g. daisy, dan-delion, nettle).
- **Deciduous trees** lose their **leaves** in the autumn every year. Evergreen trees have green leaves all year round.
- The parts of a plant including **petals, fruits, roots, bulbs, seeds, stem, trunks** and **branches**.

## What will I know by the end of the unit?

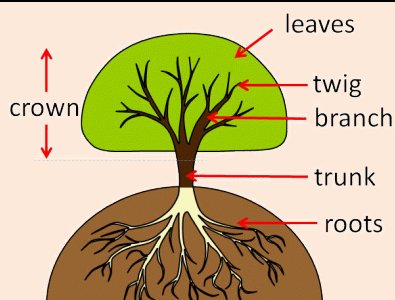
**Plants** are living things and require things to grow.

- **Plants** require things such as water, warmth, **nutrients** from soil and light to grow.
- If they do not have one or more of these things, they may stop growing.
- **Plants** can:
  - move
  - grow
  - react to their surroundings (*sense*)
  - absorb **nutrients**
  - **reproduce**

Which **plants** do we eat?

- Many **plants** provide us with food by bearing **fruits** which carry their **seeds**.
- When farmers grow **plants** to provide us with food, these are called **crops**.
- We eat many **fruits** that contain **seeds** (including tomatoes!).
- We also eat different parts of **vegetable plants**:
  - **root vegetables** (carrots, potatoes)
  - **stem vegetables** (celery, spring onion)
  - **leafy vegetables** (cabbage, lettuce)
  - **flowering vegetables** (cauliflower, broccoli)
- We eat grains and cereals from **plants** too (wheat, oats).
- Nuts and seeds are also sometimes edible (sesame seeds, pumpkin seeds, peanuts).
- Many **herbs** are also grown to add flavour to foods.

What are the parts of **common trees**?



## Investigate

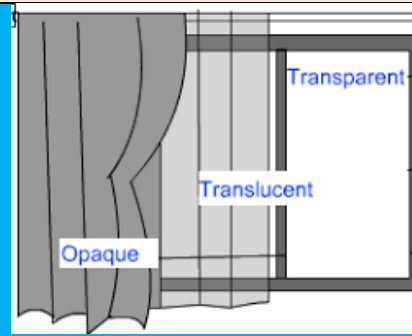
- Compare two different habitats and explain what animals and plants can be found there.
- Go on a minibeast hunt. What minibeasts can you find? Why can they survive in their habitat? Create a tally chart or pictogram to show your results.
- Compare two different microhabitats. What do you notice about the minibeasts that live in each one? Why do you think that is? Discuss how the minibeasts help keep the microhabitat healthy.
- Use your knowledge of biomes to describe the types of animals and plants that live there. Match animals and plants to their habitats (e.g. forest, ocean, poles, desert).
- Answer questions such as 'Why would a polar bear not survive in the desert?'
- Create simple food chains that begin with a plant. Discuss what would happen if one of those living things in a food chain did not exist.

## Vocabulary

branches	parts that grow out from the tree trunk and have leaves, flowers, or fruit growing on them
bulb	a root shaped like an onion that grows into a flower or plant
common	something that is found in large numbers or it happens often
crop	plants such as wheat and potatoes that are grown in large quantities for food
deciduous	a tree that loses its leaves in the autumn every year
evergreen	a tree or bush which has green leaves all the year round
flower	the part of a plant which is often brightly coloured and grows at the end of a stem
flowering	trees or plants which produce flowers
fruit	something which grows on a tree or bush and which contains seeds or a stone covered by a substance that you can eat
herb	a plant whose leaves are used in cooking to add flavour to food, or as a medicine
nutrients	substances that help plants and animals to grow
petal	thin coloured or white parts which form part of the flower
plant	a living thing that grows in the earth and has a stem, leaves, and roots
reproduce	when an animal or plant produces one or more individuals similar to itself
roots	the parts of a plant that grow under the ground
seed	the small, hard part from which a new plant grows
stem	the thin, upright part of a plant on which the flowers and leaves grow

What will I know by the end of the unit?

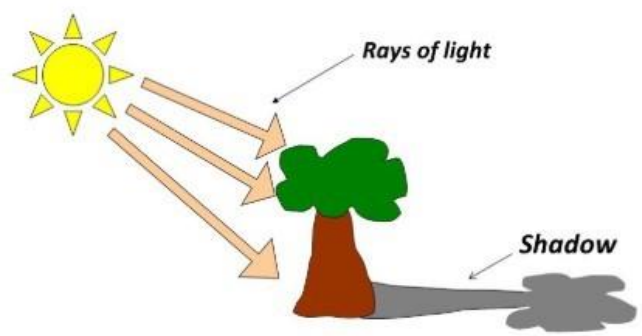
What is a light source?	<ul style="list-style-type: none"> <li>A light source is something that emits light by burning, electricity or chemical reactions.</li> <li>Burning light sources include the Sun, flames from a fire and stars.</li> <li>We must never look directly at the Sun as the light produced is very bright and can be harmful to our eyes. This is why we wear sunglasses.</li> <li>Electric lights include lamps, car headlights and street light.</li> <li>Lights that are caused by chemical reactions are much less common. This happens when different chemicals react and light is a product of that reaction. Examples can include glow sticks and fire flies.</li> </ul>
Why do we need light?	<ul style="list-style-type: none"> <li>We need light so that we are able to see in the dark. This is because the dark is the absence of light. The Sun and stars always give us light but we can only see the stars when it is dark.</li> <li>At night time we cannot see the Sun's light as the Earth turns and our part of the Earth is not lit up by the Sun at night.</li> <li>When we are driving, we need car headlights or street lights to help us.</li> </ul>
What are not sources of light?	<ul style="list-style-type: none"> <li>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.</li> <li>Shiny things are not light sources - they appear to be sources of light as they are bright.</li> </ul>
How does light travel?	<ul style="list-style-type: none"> <li>Light travels in straight lines.</li> <li>When light is blocked by an opaque object, a dark shadow is formed.</li> </ul>



- 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.
- 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..

Vocabulary	
angle	the direction from which you look at something
bright	a colour that is strong and noticeable, and not dark
chemical reactions	a process that involves changes in the structure of something
dark	the absence of light
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
light	a brightness that lets you see things.
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
product	something that is produced

Diagram



Investigate

- The brightness of torches - can you put torches in order from brightest to dimmest? What would make it a fair test?
- Why do lights seem brighter in the dark?
- Explore which objects form shadows when light is shone on them.
- How can you change the size and shape of shadows by using the same object?
- What happens when light is reflected from different surfaces? What happens when light is reflected from a mirror?

## What should I already know?

- Which things are living and which are not.
- A variety of **common wild** and **garden plants**, including **deciduous** and **evergreen trees** and how to identify them.
- The **structure** of **common flowering plants**, including **trees** (including **leaves, flowers, fruits, roots, bulbs, seeds, stem, trunks and branches**)
- **Seeds** and **bulbs** grow into **mature** plants
- **Plants** need **water, light** and a suitable **temperature** to grow and stay **healthy**.
- **Plants** and **animals** depend on each other to survive.

## What will I know by the end of the unit?

The functions of different parts of plants

- 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.
- The stem also helps to keep the plant upright so that the sunlight can reach it easier.
- The roots help to 'anchor' the plant in the soil. They also absorb water and nutrients from the soil for the stem to carry to the rest of the plant.

What different plants need to grow

- air
- water
- sunlight
- nutrients from the soil
- room to grow
- suitable temperature

The amount of each of these may vary depending on the type of plant. For example, cacti need less water than other plants.

How is water transported in plants?

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.

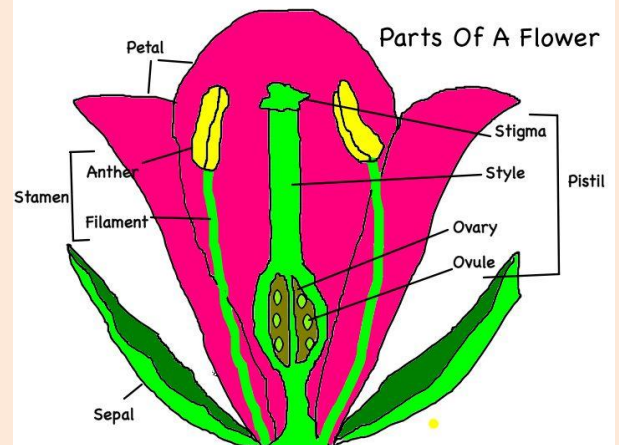
How do flowers help in the life cycle of flowering plants?

- The flower's job is to create seeds so that new plants can grow.
- 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.

## Investigate

- Compare the effect of different factors in **plant** growth (e.g. the amount of water, the amount of light and the amount of **fertiliser**). Discuss what would make this a fair test.

- Place white carnations in dyed water to observe how plants **transport** water.
- Discover how **seeds** are formed by observing **plant life cycles**.
- **Dissect** **fruits** to observe their structure and use this to explain how **seeds** are **dispersed**.



## Vocabulary


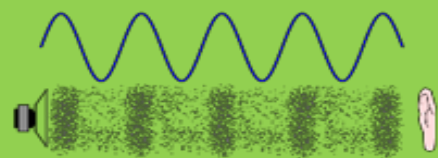
absorb	soak up or take in
anther	the part of a stamen that produces and releases the pollen
branches	parts that grow out from the tree trunk and have leaves, flowers, or fruit growing on them
bulb	a root shaped like an onion that grows into a flower or plant
carbon dioxide	a gas produced by animals and 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.
deciduous	a tree that loses its leaves in the autumn every year
dispersed	scattered, separated, or spread through a large area
dissect	to carefully cut something up in order to examine it scientifically
evergreen	a tree or bush which has green leaves all the year round
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
flowering	trees or plants which produce flowers
function	a useful thing that something does
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
mature	When something matures, it is fully developed
nutrients	substances that help plants and animals to grow
ovule	a small egg
petal	thin coloured or white parts which form part of the flower



**What should I already know?**

- Hearing is one of my five senses.
- Sounds can be combined using musical instruments.

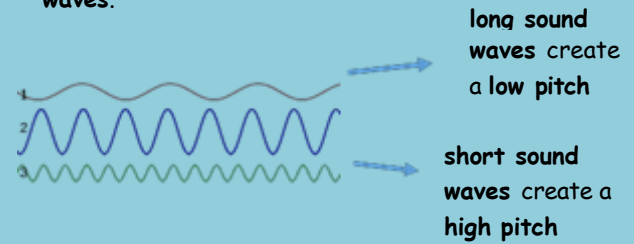
**What will I know by the end of the unit?**

What is a sound?	<ul style="list-style-type: none"> <li>• A thing that can be heard.</li> <li>• The object that makes the sound is called the source.</li> </ul>
How is a sound made?	<ul style="list-style-type: none"> <li>• When objects vibrate, a sound is made.</li> <li>• The vibration makes the air around the object vibrate and the air vibrations enter your ear. These are called sound waves.</li> <li>• If an object is making a sound, a part of it is vibrating, even if you cannot see the vibrations.</li> </ul> 
How do sounds travel?	<ul style="list-style-type: none"> <li>• Sound waves travel through a medium (such as air, water, glass, stone, and brick). For example, if somebody is playing music in the room next door, the sound can travel through the bricks in the wall.</li> </ul>
How do we hear sounds?	<ul style="list-style-type: none"> <li>• When an object vibrates, the air around it vibrates too. This vibrating air can also be known as sound waves.</li> <li>• The sound waves travel to the ear and make the eardrums vibrate.</li> <li>• Messages are sent to the brain which recognises the vibrations as sounds.</li> </ul> 
How do sounds change?	<ul style="list-style-type: none"> <li>• <b>Pitch:</b> The pitch of a sound is how high or low it is. A squeak of mouse has a high pitch. A roar of a lion has a low pitch.</li> <li>• <b>Volume:</b> The volume of a sound is how loud or quiet it is. When a sound is created by a little amount of energy, a weak sound wave is created which doesn't travel far. This makes a quiet sound.</li> <li>• A small tap of a hammer is used with small amounts of energy and so creates a quiet noise.</li> <li>• A vibration with lots of energy makes a powerful sound wave and therefore a loud sound.</li> <li>• A powerful, smashing tap of a hammer is used with lots of energy and so creates a loud noise.</li> </ul>
How do we measure sound?	<ul style="list-style-type: none"> <li>• Amplitude measures how strong a sound wave is.</li> <li>• Decibels measure how loud a sound is.</li> <li>• Frequency measures the number of times per second that the sound wave cycles.</li> </ul>

**Diagram**

**Pitch:**

- **High pitch** sounds are created by short sound waves.
- **Low pitched** sounds are created by long sound waves.



**Volume:**

- The closer you are to the **source** of the sound, the **louder** the sound will be.
- The further away you are from the **source** of the sound, the **quieter** the sound will be.

**Investigate**

- Fill identical jars with different volumes of water. Which one creates the highest pitch?
- Which material would make the best sound defender? How can you investigate this?
- Make musical instruments using different length strings. How do their pitches differ?

**Vocabulary**

amplitude	a measure of the strength of a sound wave
decibel	a measure of how loud a sound is
electricity	a form of energy that can be carried by wires and is used for heating and lighting, and to provide power for devices
energy	the power from sources such as electricity that makes machines work or provides heat
frequency	a measure of how many times per second the sound wave cycles
medium	something that makes possible the transfer of energy from one location to another
pitch	how high or low a sound is
power	Power is energy, especially electricity, that is obtained in large quantities from a fuel source and used to operate lights, heating & machinery
sound waves	invisible waves that travel through air, water, and solid objects as vibrations
source	where something comes from
transmit	to pass from one place or person to another
travel	how something moves around
vibrations	invisible waves that move quickly
volume	how loud or quiet a sound is
amplitude	a measure of the strength of a sound wave
decibel	a measure of how loud a sound is
electricity	a form of energy that can be carried by wires and is used for heating and lighting.
energy	the power from sources such as electricity that makes machines work or provides heat
frequency	a measure of how many times per second the sound wave cycles

**What should I already know?**

- Animals can be grouped into vertebrates (and then further into fish, reptiles, amphibians, birds and mammals) and invertebrates
- Some examples of life cycles (including those of plants)
- The processes of dispersal, fertilisation and germination
- Reproduction is one of the seven life processes.
- Parts of a plant, their features and what their functions are.

**What will I know by the end of the unit?**

What is reproduction?	<ul style="list-style-type: none"> <li>• Reproduction is when an animal or plant produces one or more individuals similar to itself:</li> <li>• Sexual reproduction: requires two parents with male and female gametes (cells) will produce offspring that is similar to but not identical to the parent</li> <li>• Asexual reproduction: will produce offspring that is identical to the parent requires only one parent</li> </ul>
	<ul style="list-style-type: none"> <li>• Male gametes can be found in the pollen.</li> <li>• Female gametes can be found in the ovary (they are called ovules).</li> <li>• Pollination occurs when pollen from the anther is transferred to the stigma by bees and other insects.</li> <li>• The pollen then travels down and meets the ovule. When this happens, seeds are formed - this is called fertilisation.</li> <li>• Seeds are then dispersed so that germination can begin again.</li> <li>• Some plants, such as daffodils and potatoes, can also produce offspring using asexual reproduction.</li> </ul>
What are examples of life cycles?	<ul style="list-style-type: none"> <li>• The life cycles of mammals, birds, amphibians and insects have similarities and differences.</li> <li>• 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).</li> </ul>

	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
flower	the part of a plant which is often brightly coloured and grows at the end of a stem
flowering	trees or plants which produce flowers
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
life cycle	the series of changes that an animal or plant passes through from the beginning of its life until its death
mature	When something matures, it is fully developed
metamorphosis	a person or thing develops and changes into something completely different
ovary	a female organ which produces eggs
ovule	a small egg
petal	thin coloured or white parts which form part of the flower
plant	a living thing that grows in the earth and has a stem, leaves, and roots
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
reproduction	when an animal or plant produces one or more individuals similar to itself
seed	the small, hard part from which a new plant grows
stigma	the top of the centre part of a flower which takes in pollen
structure	the way in which something is built or made

**Vocabulary**

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

**What should I already know?**

- Which things are living and which are not.
- Identifying animals (e.g. amphibians, reptiles, birds, fish, mammals, invertebrates) and plants using classification keys
- Animals that are carnivores, herbivores and omnivores.
- Animals have **offspring** which grow into adults.
- Some animals have skeletons for support, protection and movement.
- Food chains, food webs and the role of predators and prey.
- Features of habitats and the animals and plants that exist there (**biodiversity**).
- Examples of different **biomes**
- The life cycle of some animals and plants
- Sometimes **environments** can change and this has an effect on the plants and animals that exist
- Living things **breed** to produce **offspring** which grow into adults. This is called **reproduction**.
- The features of some rocks and the role they play in the formation of **fossils**

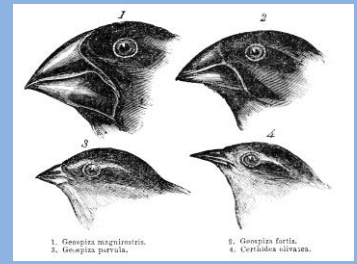
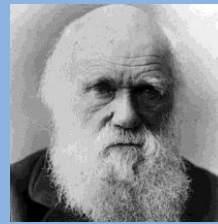
**What will I know by the end of the unit?**

What is the theory of evolution?	<ul style="list-style-type: none"> <li>• Evolution is a process of change that takes place over many generations, during which species of animals, plants, or insects slowly change some of their physical characteristics. This is because offspring are not identical to their parents.</li> <li>• It occurs when there is competition to survive. This is called natural selection.</li> <li>• Difference within a species (for example between parents and offspring) can be caused by inheritance and mutations.</li> <li>• Inheritance is when characteristics are passed on from generation to the next.</li> <li>• Mutations in characteristics are not inherited from the parents and appear as new characteristics.</li> </ul>
How do we know about evolution?	<ul style="list-style-type: none"> <li>• Evidence of evolution comes from fossils - when these are compared to living creatures from today,</li> <li>• palaeontologists can compare similarities and differences.</li> <li>• Other evidence comes from living things - comparisons of some species may reveal common ancestors.</li> </ul>
What is adaptation?	<ul style="list-style-type: none"> <li>• Adaptation is when animals and plants have evolved so that they have adapted to survive in their environments. For example, polar bears have a thick layer of blubber under their fur to survive the cold, harsh environment of the Arctic while giraffes have long necks to reach the leaves on trees.</li> <li>• Some environments provide challenges yet some animals and plants have adapted</li> </ul>

- to survive there
- Sometimes adaptations can be disadvantageous, One example of this can be the dodo, which became extinct as it lost its ability to fly through evolution. Flying was unnecessary for the dodo as it had lived for so many years without predators, until its native island became inhabited. When adaptations are more harmful than helpful, these are called maladaptations.

**Diagrams**

Charles Darwin, an evolutionary scientist, studied different animal and plant species, which allowed him to see how adaptations could come about. His work on the finches was some of his most famous.



Vocabulary	
adaptation	a change in structure or function that improves the chance of <b>survival</b> for an animal or plant within a given <b>environment</b>
ancestor	an early type of animal or plant from which a later, usually dissimilar, type has <b>evolved</b>
biodiversity	a wide variety of plant and animal <b>species</b> living in their natural <b>environment</b>
biome	a large naturally occurring community of animals and plants occupying a major habitat
breeding	the process of producing plants or animals by <b>reproduction</b>
characteristics	the qualities or features that belong to them and make them recognisable
environment	all the circumstances, people, things, and events around them that influence their life
evolution	a process of change that takes place over many <b>generations</b> , during which <b>species</b> of animals, plants, or insects slowly change some of their physical <b>characteristics</b>
extinct	no longer has any living members, either in the world or in a particular place
fossil	the hard remains of a <b>prehistoric</b> animal or plant that are found inside a rock
generation	the act or process of bringing into being; through <b>reproduction</b> , especially of <b>offspring</b>
inherit	If you inherit a <b>characteristic</b> you are born with it, because your parents or <b>ancestors</b> also had it.
maladaptation	the failure to <b>adapt</b> properly to a new situation or <b>environment</b>

mutation	<b>characteristics</b> that are not <b>inherited</b> from the parents or <b>ancestors</b> and appear as new <b>characteristics</b> .
natural selection	a process by which <b>species</b> of animals and plants that are best <b>adapted</b> to their <b>environment</b> <b>survive</b> and <b>reproduce</b> , while those that are less well <b>adapted</b> die out
offspring	a person's children or an animal's young
palaeontology	the study of <b>fossils</b> as a guide to the history of life on Earth
reproduction	when an animal or plant produces one or more individuals similar to itself
species	a class of plants or animals whose members have the same main <b>characteristics</b> and are able to <b>breed</b> with each other
survive	continue to exist
theory	a formal idea or set of ideas that is intended to explain something
variation	a change or slight difference

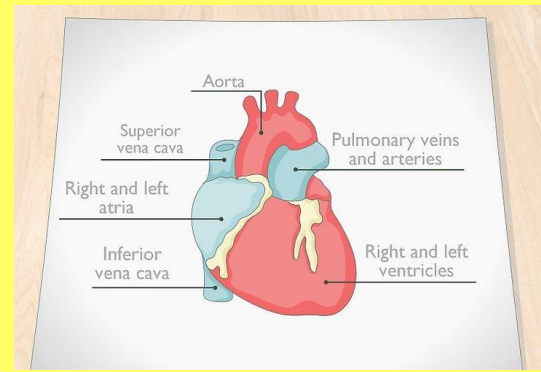
**What should I already know?**

- Which things are living and which are not.
- Classification of animals (e.g. amphibians, reptiles, birds, fish, mammals, invertebrates)
- Animals that are carnivores, herbivores and omnivores.
- Animals have offspring which grow into adults.
- The basic needs of animals for survival (water, food, air)
- The importance of exercise, hygiene and a balanced diet.
- Animals get nutrition from what they eat.
- Some animals have skeletons for support, protection and movement.
- The basic parts of the digestive system.
- The different types of teeth in humans.
- Respiration is one of the seven life processes.
- The life cycle of a human and how we change as we grow

**What will I know by the end of the unit?**

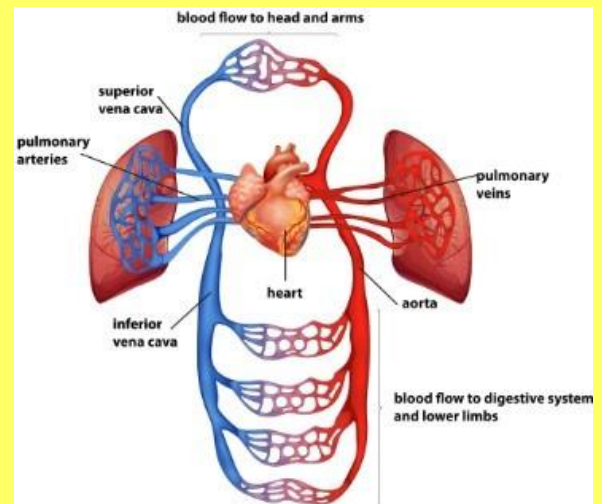
What is the circulatory system?	<p>The <b>circulatory system</b> is made of the <b>heart, lungs</b> and the <b>blood vessels</b>.</p> <ul style="list-style-type: none"> <li>• <b>Arteries</b> carry <b>oxygenated</b> blood from the <b>heart</b> to the rest of the body.</li> <li>• <b>Veins</b> carry <b>deoxygenated</b> blood from the body to the <b>heart</b>.</li> <li>• <b>Nutrients, oxygen</b> and <b>carbon dioxide</b> are exchanged via the <b>capillaries</b>.</li> </ul>
Choices that can harm the circulatory system	<p>Some choices, such as smoking and drinking alcohol can be harmful to our health.</p> <ul style="list-style-type: none"> <li>• Tobacco can cause short-term effects such as shortness of breath, difficulty sleeping and loss of taste and long-term effects such as lung disease, cancer and death</li> <li>• Alcohol can cause short-term effects such as addiction and loss of control and long-term effects such as organ damage, cancer and death</li> </ul>
Why is exercise so important?	<p>Exercise can:</p> <ul style="list-style-type: none"> <li>• tone our muscles and reduce fat</li> <li>• increase fitness</li> <li>• make you feel physically and mentally healthier</li> <li>• strengthens the heart</li> <li>• improves lung function</li> <li>• improves skin</li> </ul>

**Diagram - the Heart**



- The **heart** is composed of four chambers; the right **atrium**, the right **ventricle**, the left **atrium** and the left **ventricle**.
- How often your **heart** pumps is called your **pulse**.

**Diagram - the Circulatory System**



1. The right **atrium** collects the **deoxygenated** blood from the body, **via** the **vena cava**. It sends the blood to the right **ventricle**.
2. The right **ventricle pumps** the **deoxygenated** blood to the **lungs**. Here the blood picks up **oxygen** and disposes of **carbon dioxide**.
3. The **lungs** send **oxygenated** blood back to the left **atrium** which pumps it to the left **ventricle**.
4. The left **ventricle pumps** the blood to the rest of the body, **via** the **aorta**.

**Vocabulary**

aorta	the main artery through which blood leaves your heart before it flows through the rest of your body
arteries	a tube in your body that carries oxygenated blood from your heart to the rest of your body
atrium	one of the chambers in the heart
blood vessels	the narrow tubes through which your blood flows. Arteries, veins and capillaries are blood vessels.
capillaries	tiny blood vessels in your body

carbon dioxide	a gas produced by animals and people breathing out
circulatory system	the system responsible for circulating blood through the body, that supplies nutrients and oxygen to the body and removes waste products such as carbon dioxide.
deoxygenated	blood that does not contain oxygen
heart	the organ in your chest that pumps the blood around your body
lungs	two organs inside your chest which fill with air when you breathe in. They oxygenate the blood and remove carbon dioxide from it.
nutrients	substances that help plants and animals to grow
organ	a part of your body that has a particular purpose
oxygen	a colourless gas that plants and animals need to survive
oxygenated	blood that contains oxygen
pulse	the regular beating of blood through your body. How fast or slow your pulse is depends on the activity you are doing.
respiration	process of respiring; breathing ; inhaling and exhaling air
veins	a tube in your body that carries deoxygenated blood to your heart from the rest of your body
vena cava	a large vein through which deoxygenated blood reaches your heart from the body
ventricle	one of the chambers in the heart
via	through