

# Year 1 Science Knowledge Organiser Biology - Plants

Key Vocabulary		
wild plants	A wild plant seed grows where it falls. It doesn't need to be planted or cared for as it grows.	
garden plants	Garden plants are plants that people choose to grow in their gardens.	
weed	Weeds are wild plants that grow in places where people don't want them.	
deciduous	A deciduous tree loses its leaves each year.	
evergreen	An evergreen tree keeps its green leaves all year round, even in the winter.	

# Key Knowledge Wild Plants

# What should I already know?

- · Plants can grow.
- Deciduous trees lose their leaves in the autumn and winter.









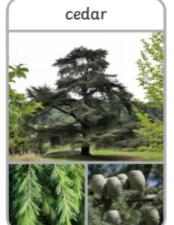








Trees







**Garden Plants** 









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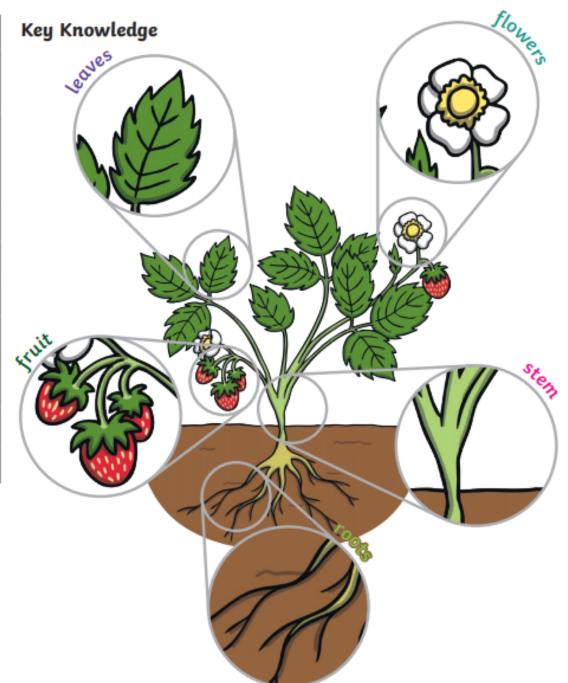




Key Vocabulary		
roots	Roots take in water and nutrients from the soil.	
stem	The stem holds the plant up and carries the water and nutrients from the roots to the leaves and flowers.	
leaves	Leaves catch sunlight to make energy.	
flowers	Flowers attract insects and birds.	
petals	Petals are the colourful part of the flower.	
fruit	Fruit contains the plant's seeds. Sometimes humans try to grow fruit without seeds because it's easier to eat.	
seed	Seeds grow into new plants.	
bulb	Bulbs grow into new plants.	









# Year 2 Science Knowledge Organiser Biology - Plants

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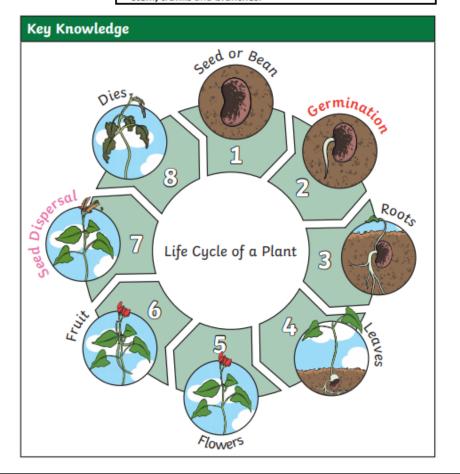
Key Vocabulary		
germination	When the conditions are right, the seed soaks up water and swells, and the tiny new plant bursts out of its shell. This is called germination.	
sprout	When a plant sprouts, it grows new shoots.	
shoot	A shoot grows upwards from the seed or plant to find sunlight.	
seed dispersal	Seed dispersal is when the seeds move away from the parent plant. They can be moved by the wind or animals.	



Plants can grow.
<ul> <li>The names of some common garden plants (e.g. poppy, rose)</li> </ul>
and the names of some common wild plants (e.g. daisy,
dandelion, nettle).
Deciduous trees lose their leaves in the autumn every year.

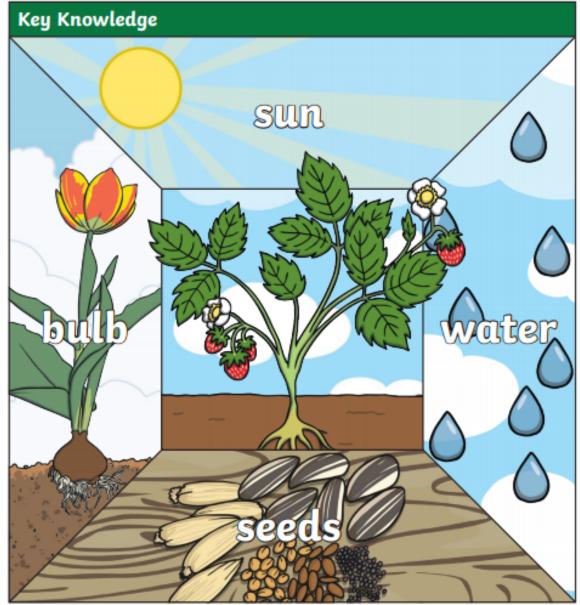
What should I already know?

- Evergreen trees have green leaves all year round.
- The parts of a plant including petals, fruits, roots, bulbs, seeds, stem, trunks and branches.



Key Vocabulary		
What do plants need to grow well?		
sunlight	All plants need light from the sun to grow well. Some plants need lots of sunlight. Some plants only need a little sunlight.	
water	All plants need water to grow. Without water, seeds and bulbs will not germinate.	
temperature	Temperature is how warm or cold something or somewhere is. Some plants like cooler temperatures and some like warmer temperatures.	
nutrition	Food or nourishment. Plants make their own food in their leaves using sunlight.	







# Year 2 Science Knowledge Organiser Biology - Animals Including Humans



Key Vocabul	Key Vocabulary		
adult	A fully grown animal or plant.		
develop	To grow and become stronger.		
life cycle	The changes living things go through to become an adult.		
offspring	The child of an animal.		
reproduce	When living things make a new living thing of the same kind.		
young	Offspring that has not reached adulthood.		
live young	Offspring that has not hatched from an egg.		

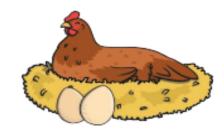
All living things reproduce and have offspring.

Some animals give birth to live young.
Their offspring normally look like them when they are born.

Other animals have offspring which do not look like them, e.g. fish and amphibians.

Some animals lay eggs which hatch into live young. This **young** then develops into an **adult**.

When these eggs hatch, some animals look like their adult, e.g. birds and reptiles.



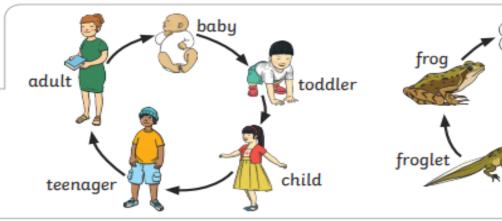
spawn

tadpole

tadpole

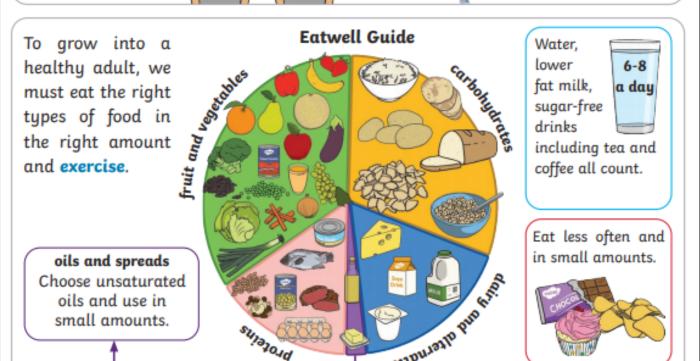
with legs

All young animals change at different stages as they grow into adults.



Key Vocabulary		
dehydrate	To lose water (dry out).	
diet	The food and water that an animal needs.	
disease	Illness or sickness.	
energy	The power needed to carry out a task.	
exercise	A physical activity to keep your body fit.	
germs	Bugs that cause disease and illness.	
heart rate	The number of times a heart beats in one minute.	
hygiene	How clean something is (to stay healthy and stop disease and illness spreading).	
nutrition	Food needed to live.	
pulse	The beating of the heart that can be felt in your neck and wrist.	

To stay alive, all air water food animals have 3 basic needs:



To stop illness and infections spreading, we must be hygienic and keep ourselves clean.



# hat should I already know

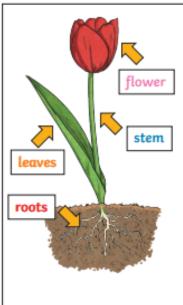
- - amphibians, birds)

    Vortehrates are animals that have a hackho
- Some animals are suitable to be kept as pets but othor.
- Some animals give birth to live young but others lay eggs



# Year 3 Science Knowledge Organiser Biology - Plants

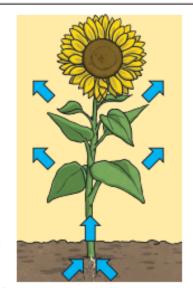




# How Water Moves through a Plant

- The roots absorb water from the soil.
- The stem transports water to the leaves.
- Water evaporates from the leaves.
- This evaporation causes more water to be sucked up the stem.

The water is sucked up the stem like water being sucked up through a straw.



# water light stem like water being sucked up through a straw. What Does a Plant Need to Grow? nutrients from the soil air room to grow

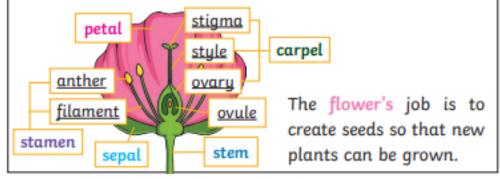
Different plants vary in how much of these things they need. For example, cacti can survive in areas with little water, whereas water lilies need to live in water.

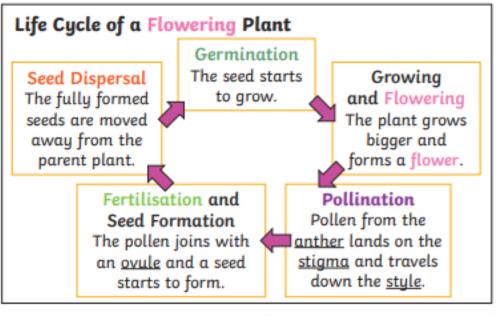
### What should I already know?

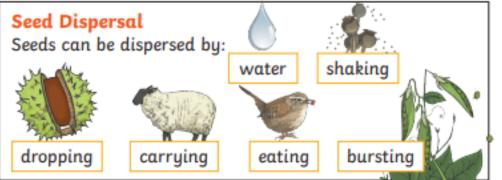
- · Which things are living and which are not.
- A variety of common wild and garden plants, including deciduous and evergreen trees and how to identify them.
- The structure of common flowering plants, including trees (including leaves, flowers, fruits, roots, bulbs, seeds, stem, trunks and branches)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

roots	These anchor the plant into the ground and absorb water and nutrients from the soil.
stem	This holds the plant up and carries water and nutrients from the soil to the leaves. A trunk is the stem of a tree.
leaves	These make food for the plant using sunlight and carbon dioxide from the air.
flowers	These make seeds to grow into new plants. Their petals attract pollinators to the plant.
nutrients	These substances are needed by a living things to grow and survive. Plants get nutrients from the soil and also make their own food in their leaves.
evaporation	When a liquid turns into a gas.

Key Vocabulary		
fertilisation	When the male and female parts of the flower have mixed in order to make seeds for new plants.	
petal	The brightly coloured part of the flower that attracts insects to pollinate the plant.	
stamen	The male parts of the flower. The stamen is made up of the anther and the filament. The filament's job is to hold up the anther. The job of the anther is to make the pollen.	
carpel (pistil)	The female parts of the flower. Made up of the stigma, style and ovary. The job of the style is to hold up the stigma. The stigma collects the pollen when a pollinator brushes by it. The ovary contains the ovules, which are the part of the flower that gets fertilised and eventually becomes the new seed.	
sepal	Leaf-like structures that protect the flower and petals before they open out.	
pollination	When pollen (a fine powdery substance produced by a flowering plant) is moved from the male anther of a flower to the female stigma.	
pollinator	Animals or insects which carry pollen between plants. Examples include birds, bees and bats.	
germination	When a seed starts to grow.	
seed dispersal	A method of moving the seeds away from the parent plant so that the seeds have the best chance of survival.	









# Year 3 Science Knowledge Organiser Biology - Animals Including Humans



What	should	Lalready	know?
willar	Silvaia	ancau	, KIIOW.

- · All animals need water, air and food to survive.
- . The different ways in which humans can be healthy.
- · Examples of healthy and unhealthy food choices.

Key Vocabulary	
healthy	in a good physical and mental condition
nutrients	substances that animals need to stay alive and healthy
energy	strength to be able to move and grow
saturated fats	types of fats, considered to be less healthy, that should only be eaten in small amounts
unsaturated fats	fats that give you energy, vitamins and minerals

- Living things need food to grow and to be strong and healthy.
- · Plants can make their own food, but animals cannot.
- To stay healthy, humans need to exercise, eat a healthy diet and be hygienic.
- Animals, including humans, need food, water and air to stay alive.

Nutrient	Found in (examples)	What it does/they do
carbohydrates	BUDGET CRAIN  WESTERS ASSESSED TO THE PASTA	provide <mark>energy</mark>
protein	YOGHUR!	helps growth and repair
fibre	WHICH CAN PREMIUM WHOLEMEAL	helps you to digest the food that you have eaten
fats	PLAIN NUTS	provide <mark>energy</mark>
vitamins	PLAIN NUTS	keep you <b>healthy</b>
minerals		keep you <b>healthy</b>
water		moves <b>nutrients</b> around your body and helps to get rid of waste

Key Vocabulary	
vertebrate	animals with backbones
invertebrate	animals without backbones
muscles	soft tissues in the body that contract and relax to cause movement
tendons	cords that join muscles to bones
joints	areas where two or more bones are fitted together





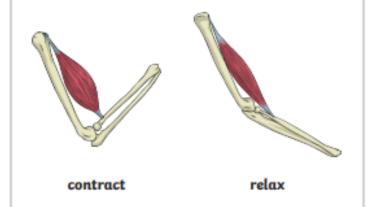
### What should I already know?

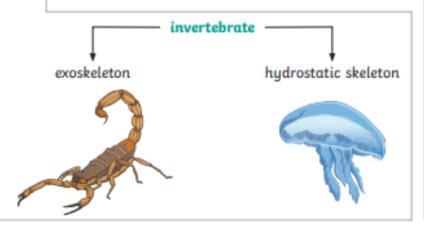
- The parts of the human body and what they do.
- There are five types of vertebrates (mammals, fish, reptiles, amphibians, birds)
- Vertebrates are animals that have a backbone.
- Invertebrates are animals that do not have a backbone.
- · All animals need water, air and food to survive.
- The different ways in which humans can be healthy.

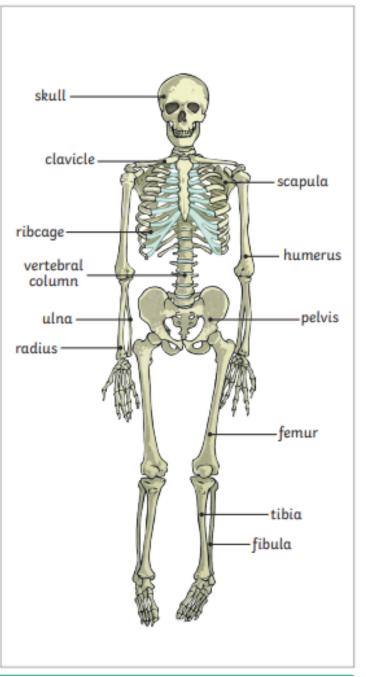
Skeletons do three important jobs:

- · protect organs inside the body;
- · allow movement;
- support the body and stop it from falling on the floor.

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





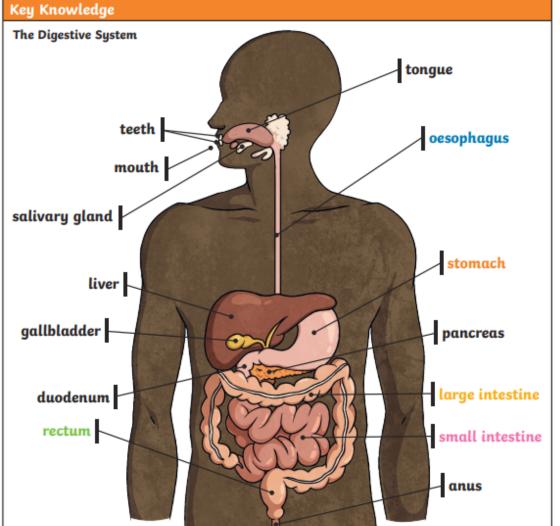




# Year 4 Science Knowledge Organiser Biology - Animals Including Humans

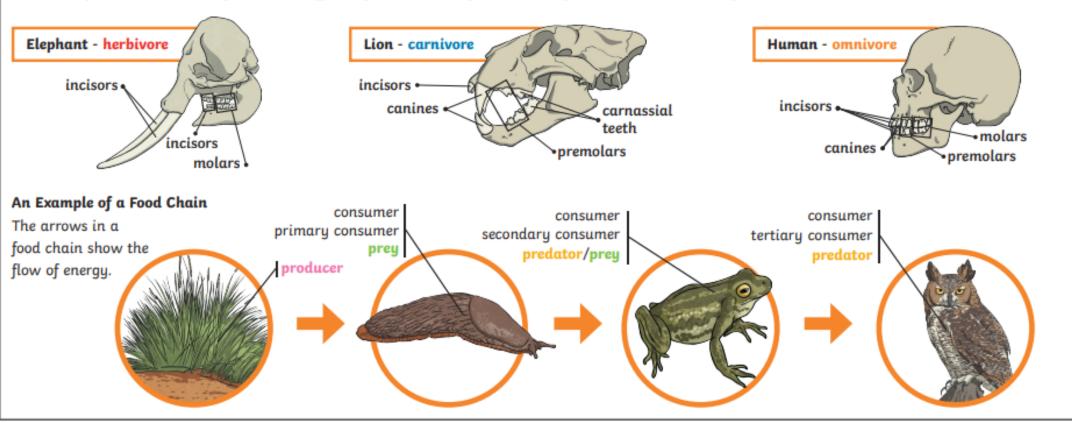


Key Vocabula		
digest	Break down food so it can be used	
	by the body.	
oesophagus	A muscular tube which moves food from	
vesopnagus	the mouth to the stomach.	
	An organ in the digestive system where	
stomach	food is broken down with stomach acid	
	and by being churned around.	
small intestine	Part of the intestine where nutrients are	
	absorbed into the body.	
large intestine	Part of the intestine where water is	
	absorbed from remaining waste food.	
	Stools are formed in the large intestine.	
rectum	Part of the digestive system where stools	
	are stored before leaving the body through	
	the anus.	
	,	
Human Teeth and Their Functions		



# Key Knowledge

The teeth of an animal are designed to eat different foods depending on the diet of the animal. Examples of a herbivore, a carnivore and an omnivore skull:



Key Vocabulary		
herbivore	An animal that eats plants.	
carnivore	An animal that feeds on other animals.	
omnivore	An animal that eats plants and animals.	
producer	A plant that produces its own food.	
predator	An animal that hunts and eats other animals.	
prey	An animal that gets hunted and eaten by another animal.	

## To help prevent tooth decay:

- limit sugary food and drink;
- brush teeth twice daily using a fluoride toothpaste;
- visit your dentist regularly.





How land use has changed over time and the effects this has on the

# Year 4 Science Knowledge Organiser Biology - Living Things and Their Habitats



Key Vocabulary	
organisms	This is another word that can be used to mean 'living things'.
life processes	The things living things do to stay alive.
respiration	A process where plants and animals use oxygen gas from the air to help turn their food into energy.
sensitivity	The way living things react to changes in their environment.
reproduction	The process through which young are produced.
excretion	The process by which living things get rid of waste products.
nutrition	Food which provides living things with energy to live and stay healthy.
habitat	The specific area or place in which particular animals or plants may live.
environment	An <b>environment</b> contains many <b>habitats</b> and these include areas where there are both living and non-living things.
endangered species	A plant or animal where there are not many of their species left and scientists are concerned that the species may become <b>extinct</b> .
extinct	When a species has no more members alive on the planet, it is extinct.

Life Processes		
To stay alive and health	y,	
all living things need certa	in	
conditions that let them		
carry out the seven		
life processes:		

Movement Reproduction
Respiration Excretion
Sensitivity Nutrition



Changes to an environment can be natural or caused by humans. Changes to an environment can have positive as well as negative effects. Here are some examples of things that can change an environment.

earthquakes

floods

droughts

wildfires

the seasons

uakes // • deforestation

• storms /

🍣 • pollution • urbanisation

 the introduction of new animal or plant species to an environment

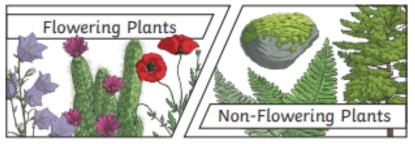
creating new nature reserves

Plants and animals rely on the **environment** to give them everything they need. Therefore, when **habitats** change, it can be very dangerous to the plants and animals that live there.

Key Vocabulary		
classification	This is where plants or animals are placed into groups according to their similarities.	
vertebrates	Animals with a backbone.	
invertebrates	Animals without a backbone.	
specimen	A particular plant or animal that scientists study to find out about its species.	
characteristics	The distinguishing features or qualities that are specific to a species.	

Plants can be sorted into many different groups.

For example:



Animals can be grouped in lots of different ways based upon their characteristics.

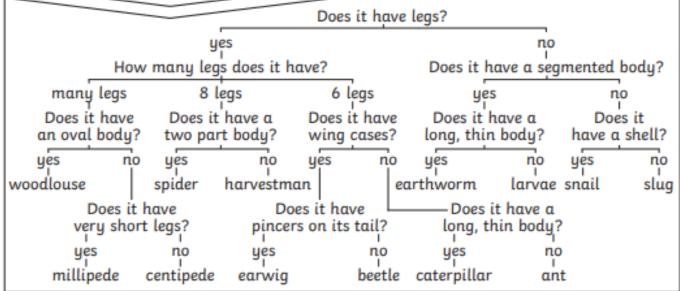
# vertebrates invertebrates fish birds reptiles amphibians insects spiders worms invertebrates slugs and snails

Vertebrates can be separated into five broad groups.

You can use classification keys to help group, identify and name a variety of living things. Here is an example of a classification key:

You could sort invertebrates you might see around school in different ways, such as in this example. The vast majority of living things on the planet are invertebrates.

# Invertebrate Classification Key





# Year 5 Science Knowledge Organiser Biology - Living Things and Their Habitats



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Key Vocabulary	
asexual reproduction	One parent is needed to create an offspring, which is an exact copy of the parent.
fertilise	The action of fusing the male and female sex cells in order to develop an egg.
gestation	The length of a pregnancy.
life cycle	The journey of changes that take place throughout the life of a living thing including birth, growing up and reproduction.
metamorphosis	An abrupt and obvious change in the structure of an animal's body and their behaviour.
pollination	The transfer of pollen to a stigma to allow fertilisation.
reproduction	The process of new living things being made.
sexual reproduction	Two parents are needed to make offspring which are similar but

not identical to either parent.

develop inside their Humans mothers and are dependent on their parents for many years until they are old enough to look after themselves.



Amphibians such as frogs are laid in eggs then, once hatched, go through many changes until they become an adult.



Some animals, such as butterflies, go through metamorphosis to become an adult.



Birds are hatched from eggs and are looked after by their parents until they are able to live independently.

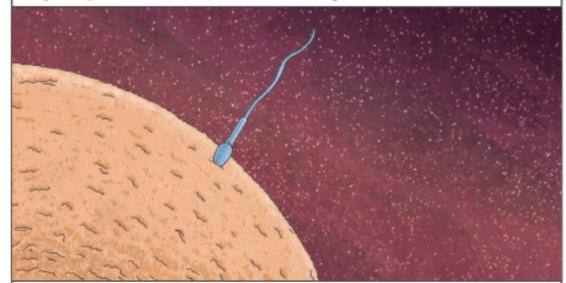


Some living things, such as plants, contain both the male and female sex cells. In others, such as humans, they contain either the male or female sex cell.

# Reproduction in mammals

Mammals use sexual reproduction to produce their offspring.

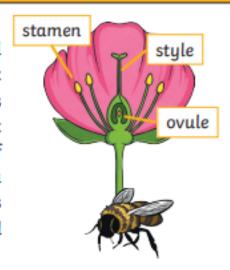
- The male sex cell, called the sperm, fertilises the female sex cells.
- The fertilised cell divides into different cells and will form a baby with a beating heart.
- The baby will grow inside the female until the end of the gestation period when the baby is born.



Echidnas and platypus are mammals but they lay eggs rather than giving birth to live young.

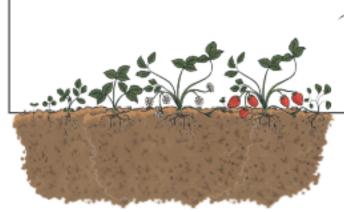
## **Plants**

Most plants contain both the male sex cell (pollen) and female sex cell (ovules), but most plants can't fertilise themselves. Wind and insects help to transfer pollen to a different plant. The pollen from the stamen of one plant is transferred to the stigma of another. The pollen then travels down a tube through the style and fuses with an ovule.



Some plants, such as strawberry plants, potatoes, spider plants and daffodils use asexual reproduction to create a new plant.

They are identical to the parent plant.





of plants and humans)

cycles (including those

growth are two of

Reproduction and

How to live a healthy lifestyle

reptiles, amphibians, birds and mammals).

grouped into vertebrates (and then further into fish,

# Year 5 Science Knowledge Organiser Biology - Animals Including Humans



# Key Knowledge

### fertilisation

The male and female sex cells fuse together.















### prenatal

The cells develop and grow into a foetus inside the mother's uterus. After around nine months, the baby is born.

### infancy

Rapid growth and development. Children learn to walk and talk.

### childhood

Children learn new skills and become more independent.

### adolescence

The body starts to change over a few years. The changes occur to enable reproduction during adulthood.

Much more independent.

### middle adulthood

Ability to reproduce decreases.
There may be hair

There may be hair loss or hair may turn grey.

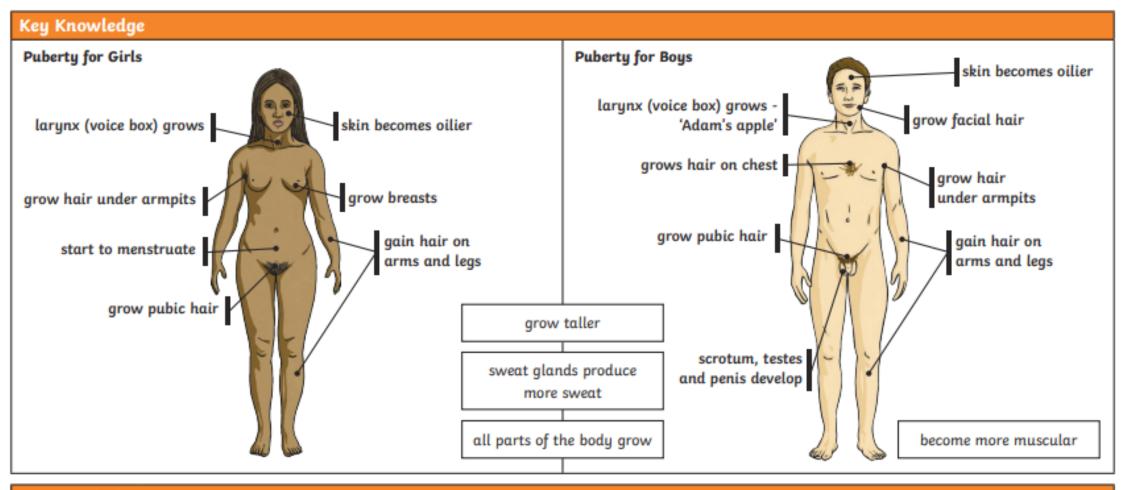
### late adulthood

Leading a healthy lifestyle can help to slow down the decline in fitness and health which occurs during this stage.

# early adulthood

The human body is at its peak of fitness and strength.

Key Vocabulary	
fertilisation	The process of the male and female sex cells fusing together.
prenatal	The stage of development from the time of fertilisation to the time of birth.
gestation	The process or time when prenatal development takes place before birth.
reproduce	To produce young.
asexual reproduction	A process where one parent produces new life.
sexual reproduction	A process where two parents – one male and one female – are required to produce new life.
life cycle	The changes a living thing goes through, including reproduction.



Key Vocabulary		
adolescence	The social and emotional stage of development between childhood and adulthood.	
puberty	The physical stage of development between childhood and adulthood.	
menstruation	When the female body discharges the lining of the uterus. This happens approximately once a month.	
adulthood	The stage of development when a human is fully grown and mature.	
life expectancy	The length of time, on average, that a particular animal is expected to live.	



# Year 6 Science Knowledge Organiser Biology - Living Things and Their Habitats



Key Vocabulary			
characteristics	Special qualities or appearances that make an individual or group of things different to others.		
classify	To sort things into different groups.		
taxonomist	A scientist who classifies different living things into categories.		
key	A key is a series of questions about the characteristics of living things.  A key is used to identify a living thing or decide which group it		

Scientists, called Taxonomists, sort and group living things according to their similarities and differences.

'no' questions.

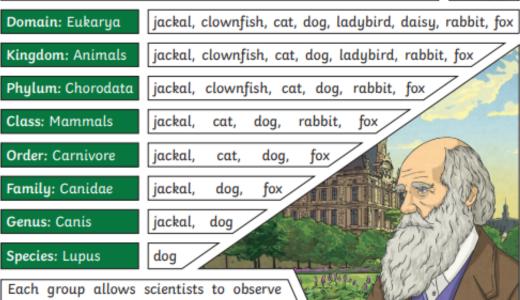
	Is it warmblooded?					
	y	es	no			
	Does it have feathers?		Does it live on land?			
	yes	no	yes	no		
1	It's a bird	It's α	Does it have scales?	It's α		
1	bira			fish		
		_	es no I I s a It's an			
			tile amphibia	n		

	Classification	
Special qualities or appearances that make an individual or group of things different to others.	In 1735, Swedis system for classi of this system is	
To sort things into different groups.	Living things car	
A scientist who classifies different living things into categories.	of living things is left in its spec	
A key is a series of questions about	Domain: Eukary	
the <b>characteristics</b> of living things.  A <b>key</b> is used to identify a living	Kingdom: Animo	
thing or decide which group it	Phylum: Chorod	
belongs to by answering 'yes' or	Class: Mammals	

35, Swedish Scientist Carl Linnaeus first published a em for classifying all living things. An adapted version is system is still used today: The Linnaeus System.

and understand the characteristics of living things more clearly. They group similar things together then split the groups again and again based on their differences.

ng things can be classified by these eight levels. The number ring things in each level gets smaller until the one animal t in its species level. This is how a dog would be classified.



•	<ul> <li>Animals can be grouped into carnivores, herbivores and</li> </ul>
	omnivores. They can also be grouped into vertebrates an
	invertebrates.
•	Organisms can be classified and we can use a classification
	to identify them.
•	Examples of habitats (including microhabitats) and the org
	that can be found there.
•	Living things depend on each other to survive.
•	<ul> <li>How environments are changing.</li> </ul>
•	The relationships between production and prou

chains demonstrate the direction in which energy travels

Key Vocabulary		
bacteria	A single-celled microorganism.	
microorganism	An organism that can only be seen using a <b>microscope</b> , e.g. bacteria, mould and yeast.	
microscope	A piece of equipment that is used to view very tiny (microscopic) things by magnifying their appearance.	
species	A group of animals that can reproduce to produce fertile offspring.	

Helpful Microbes	Harmful Microbes
Bacteria – cheese	Bacteria – salmonella is a bacterium that can lead to food poisoning
Yeast – wine	Virus – chicken pox and flu are examples of viral diseases
Bacteria – yoghurt	Fungi – athlete's foot
Yeast – bread dough	Bacteria – plaque
Penicillium fungi - antibiotics	Fungi - mould

# Microorganisms

Microorganisms are viruses, bacteria, moulds and yeast. Some animals (dust mites) and plants (phytoplankton) are also microorganisms.

Microorganisms are very tiny living things that can only be seen using a microscope. They can be found in and on our bodies, in the air, in water and on objects around us.

