Science - Autumn Term 1

Animals including humans

Why are plants at the start of every food chain?	Answer
How do plants make their own food?	Answer
Name 5 groups of food. Why are they important?	Answer
What is a meant by the saying a ‘healthy plate’?	Answer
Give three reasons why we need to have a skeleton.	Answer
Why do we need muscles and how can we make them stronger?	Answer

ANIMALS including Humans KNOWLEDGE ORGANISER

Y3

What you should already know...

-Animals can be split into different groups (e.g. birds/fish & carnivores/omnivores)

-All animals have basic needs that have to be met in order for them to survive: water, food, shelter, oxygen, temperature

-Animals have different stages in their lives – birth, growth, reproduction and death.

-Humans (and most other animals) need to stay healthy, by exercising, eating a balanced diet, and being hygienic.

Nourishment

-Unlike plants, animals cannot create their own food. They get nutrition from what they eat.

-This is because animals do not have chlorophyll, or chloroplasts in their cells, like plants do.

-Therefore, plants are called producers and animals are called consumers.

-The different nutrients that animals get depends on their diet. For example, a cheetah gets lots of protein in its diet because it is a carnivore (eats meat).

Types of Nutrition

Carbohydrates

-Carbohydrates give the consumer energy.

-Foods that have lots of carbohydrates in are often called 'starchy' foods.

-Carbohydrate-rich foods include pasta, rice, oats, breads, breakfast cereals and barley.

Protein

-Protein helps the body (especially the muscles) to repair itself.

-Protein-rich foods include meat, eggs & nuts.

Fat

-Fats also give consumers lots of energy. However, too much fat is not healthy!

-Butter, cakes & fast food contain lots of fat.

Fibre

-Fibre helps our digestive systems to work well.

-Fibre is often found in high-carboydrate foods like bread, cereal, potatoes, and some fruits.

Vitamins and Minerals

-There are many different vitamins and minerals that perform hundreds of roles in the body.

Fruit and vegetables are vitamin/mineral-rich.

Skeletons and Muscles

Skeleton

-Humans (and many other animals) have a system of bones called a skeleton.

-Skeletons help to support your body – they give it its shape.

-Skeletons are also important for movement. Muscles are attached to bones.

-Finally, skeletons help to protect important parts of the body. E.g. the ribs protect the heart and lungs.

Muscular System

-Humans (and many other animals) also have a system of muscles in their bodies.

-The main purpose of muscles is for movement. As they contract, muscles move parts of the body around.

-Muscles are also important for maintaining posture, helping humans/ animals to sit, stand, and walk.

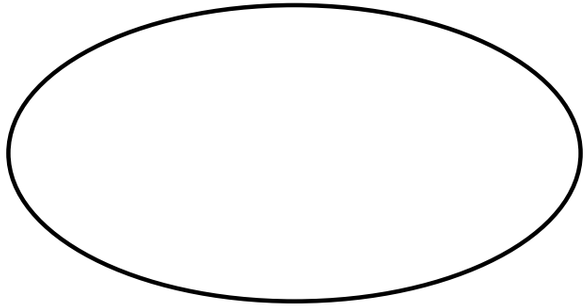
-Some muscles (e.g. the heart) move by themselves – they are involuntary.

Amounts of Nutrition

Mouse 0.004kg per day → Deer 4kg per day → Tiger 15kg per day → Blue Whale 3,500kg per day

National curriculum	Animals, including humans: healthy body
Year 2	notice that animals, including humans, have offspring which grow into adults
Year 2	find out about and describe the basic needs of animals, including humans, for survival (water, food and air)
Year 2	describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene
Year 3	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
Year 3	identify that humans and some other animals have skeletons and muscles for support, protection and movement

Mind Map



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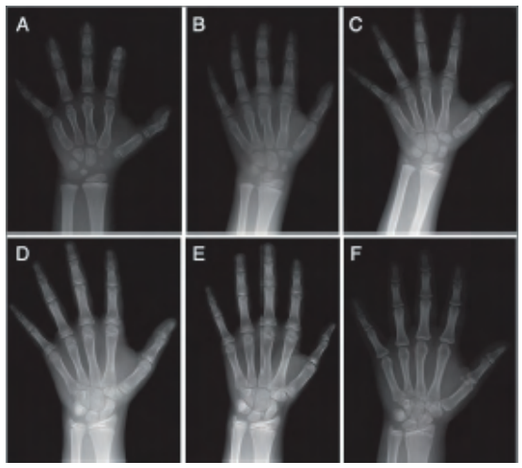

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Science - Autumn Term 2

Light

Can you name some sources of light?	Answer
Is the moon a light source?	Answer
Which colour coat would be safest to wear if you were walking along a road at night?	Answer
Why is it that only still water can reflect a clear image?	Answer
Name some objects that would make solid shadows.	Answer
How can you make a shadow larger?	Answer

LIGHT KNOWLEDGE ORGANISER

Y3

Overview

-Light is a form of energy that makes it possible to see.

Light is given off some objects (for example the Sun). Darkness is when there is no light.

-Light can reflect off surfaces (e.g. mirrors)

-Objects can be labelled as transparent, translucent, or opaque, depending on the amount of light that they let through.

-Shadows are formed when light is blocked by an opaque object.

Light – Key Terms

Dark

-Darkness is the absence of light. In other words, where there is no light, it is dark!

-Human vision is unable to see colours when there is high levels of darkness (too little light).

-At nighttime, the sky is darker because there is a lack of light from the sun.

Absorption

-When light hits an object, it may be absorbed into the object.

-This means that it doesn't bounce off or pass through the object.

-Some examples of materials/objects that absorb light include wood, brick and stone.

Reflection

-Light may also reflect off the surface of an object.

-This means that light bounces off the object, sending it in another direction.

-Some examples of materials/objects that reflect light include mirrors or polished metal surfaces.

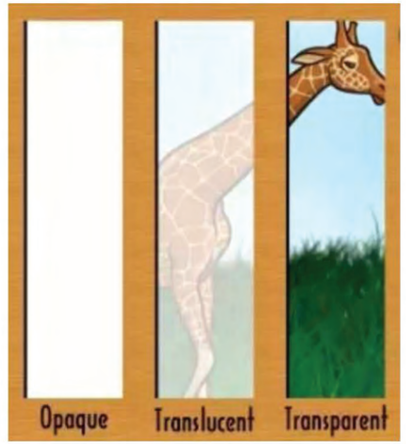
Transmission

-Light can also be transmitted through certain objects.

-This means that it passes through the object. It can be seen from the other side of the object.

-Some examples of materials/objects that transmit light include windows and clean water.

Transparent, Translucent and Opaque



When light hits an object, it can be absorbed by the object, reflect (bounce off) the object, or (transmit) pass through an object.

The three key terms below tell us how much light objects let through them.

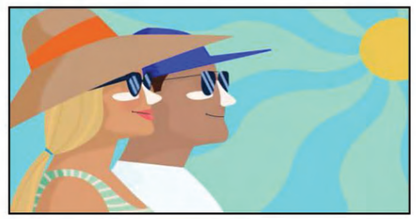
Transparent – Transparent objects allow all of the light to pass through them. This means that we can clearly see through them.

Translucent – Translucent objects only allow some light to pass through them. This means that we can partially see through them.

Opaque – Opaque objects do not allow any light to pass through them. This means cannot see through them at all.

Protection from Light

Some types of light (e.g. light from the sun) can be dangerous for our eyes and skin. This is because they contain UV rays that can cause damage. There are several things that we can do to protect ourselves in the sun.



1. Wearing sunglasses – Sunglasses reduce the amount of light (and also the UV rays) that reaches our eyes.

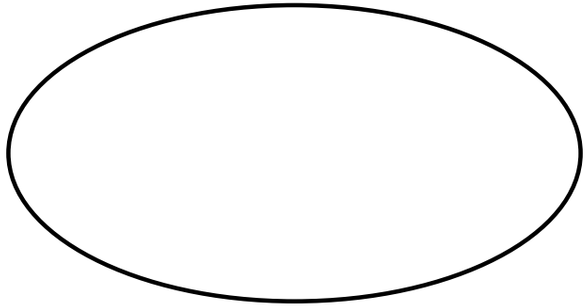
2. Covering up – Clothes can help to block some of the UV rays that can damage our skin.

3. Sun cream – This stops our skin from absorbing as many UV rays, protecting it from harm.

Transparent Objects			Translucent Objects				Opaque Objects		
Windows	Water	Air	Frosted Glass	Tracing Paper	Flower Petals	Plastic Milk Carton	Table	Sofa	Brick

National curriculum	Light and shadows
Year 3	recognise that they need light in order to see things and that the dark is the absence of light
Year 3	notice that light is reflected from surfaces
Year 3	recognise that light from the sun can be dangerous and that there are ways to protect their eyes
Year 3	recognise that shadows are formed when the light from a light source is blocked by a solid object
Year 3	find patterns in the way that the size of shadows changes

Mind Map



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Science - Spring Term 1

Rocks and Soil

What are the three different types of rocks?	Answer
What does the word metamorphic mean?	Answer
What is a fossil?	Answer
What is the name of people who study rocks?	Answer
What is soil made of?	Answer
How are rocks formed?	Answer

Ryefield Primary School - Science

Topic: Rocks	Year: 3	Science

What should I already know?

- The role of Mary Anning in **palaeontology** and the discovery of **fossils**.
- **Soil** contains **nutrients** and these help plants to grow.
- The meaning of the word **absorb.**
- That **magma** is **molten** rock that is formed in very hot conditions inside the earth.
- Why some materials are used for certain purposes because of their **properties**

Vocabulary

absorb	soak up or take in
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
igneous	**rocks** that are formed by volcanic action or intense heat
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
man-made	things are created by people
metamorphic	**rocks** that have had their original structure changed by **pressure** and heat
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
natural	things that exist in nature and are not made by people
nutrients	substances that help plants and animals to grow
palaeontology	the study of **fossils** as a guide to the history of life on Earth
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
preserve	to protect from **decay**
pressure	force that you produce when you press hard on something
properties	the qualities or features that belong to something and make it recognisable
rock	a solid mass made up of **minerals**. Rock forms much of the earth's outer layer, including cliffs and mountains
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
soil	the substance on the **surface** of the earth in which plants grow
surface	the flat top part of something or the outside of it
surrounding	to be present all around
volcano	a mountain from which hot melted rock, **gas**, steam, and ash from inside the Earth sometimes burst.
weathered	affected by the weather

Investigate!

- Explore the types of **rocks** you can find in the local environment.
- Explain why **rocks** are used for different purposes based on their **properties.**
- Research the different living things whose **fossils** are found.
- Explore the different kinds of **soils** , including those you can find in the local environment.
- Compare different types of **soils** by saying what is similar and what is different using scientific vocabulary.
- Investigate what happens when **rocks** are rubbedtogether.
- Investigate what happens to **rocks** when they are inwater.
- Sort different types of rocks based on how rough or smooth they are, whether they have **grains** or crystals, how **permeable** they are, how easily they can break down, how strong they are and what they look like.

What will I know by the end of the unit?

What are the different types of **rocks?**

- 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, hard-wearing 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

Bricks and concrete are not **rocks** because they are **man-made.**

What are **fossils?**

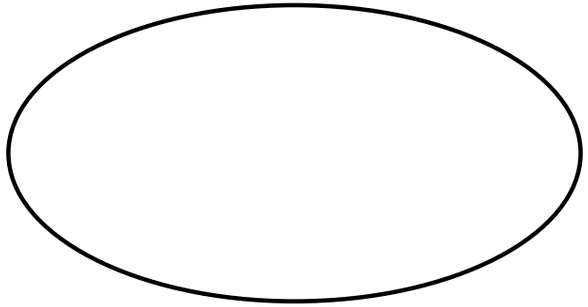
- **Fossils** are the remains of **prehistoric** life.
- They are usually formed when a living thing (plant or animal) dies and the body is covered up or buried by **sediment** over tens of thousands of years.
- Some **fossils** are formed when the tough bones and teeth in animals, and the woody part of plants are **preserved .**
- Other **fossils** are made from **imprints** in **surrounding sedimentary rock** such as footprints or **imprints** from shells.
- **Fossils** tell us about the Earth and about life that existed hundreds of thousands and millions of years ago.

What is **soil?**

- **Soil** is made from pieces of rock, **minerals, decaying** plants and water.
- When **rock** is broken down into small **grains, soil** is formed.
- There are layers of **soil:**
  - above the soil is **leaf litter** and recently **decaying** plants.
  - as the **soil** becomes deeper, the **rock grains** become larger until **bedrock** is reached.

National curriculum	Materials: rocks
Year 3	compare and group together different kinds of rocks on the basis of their appearance and simple physical properties
Year 3	describe in simple terms how fossils are formed when things that have lived are trapped within rock
Year 3	recognise that soils are made from rocks and organic matter

Mind Map



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Science - Spring Term 2

Forces and Magnets

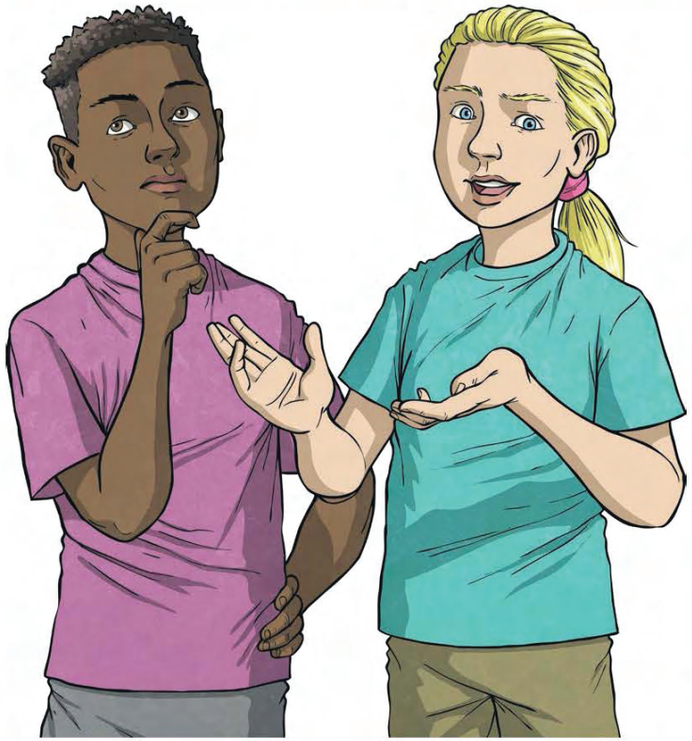
What is a force?	Answer
Are all metals attracted to magnets? Give examples.	Answer
What happens when 2 magnets repel?	Answer
Does every force need contact with an object? If not, which forces don't need contact?	Answer

Forces and

Year

Key Vocabulary

forces	Pushes or pulls.
friction	A force that acts between two surfaces or objects that are moving, or trying to move, across each other.
surface	The top layer of something.



Key Knowledge

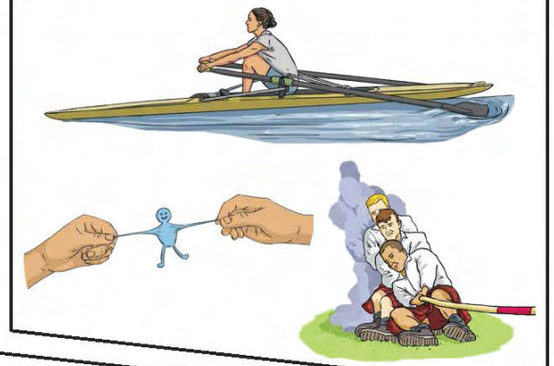
Different surfaces create different amounts of friction. The amount of friction created by an object moving over a surface depends on the roughness of the surface and the object, and the force between them.

The driving force pushes the bicycle, making it move.

Friction pushes on the bicycle, slowing it down.

Pushes

Pulls



Forces will change the motion of an object.
They will either make it start to move, speed up, slow it down or even make it stop.

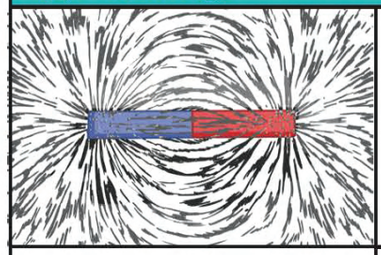
Forces and

Year

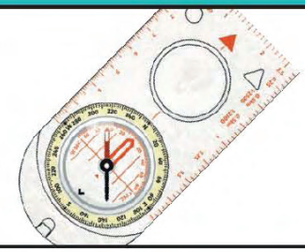
Key Vocabulary

magnet	An object which produces a magnetic force that pulls certain objects towards it.
magnetic	Objects which are attracted to a magnet are magnetic. Objects containing iron, nickel or cobalt metals are magnetic.
magnetic field	The area around a magnet where there is a magnetic force which will pull magnetic objects towards the magnet.
poles	North and south poles are found at different ends of a magnet.
repel	Repulsion is a force that pushes objects away. For example, when a north pole is placed near the north pole of another magnet, the two poles repel (push away from each other).
attract	Attraction is a force that pulls objects together. For example, when a north pole is placed near the south pole of another magnet, the two poles attract (pull together).

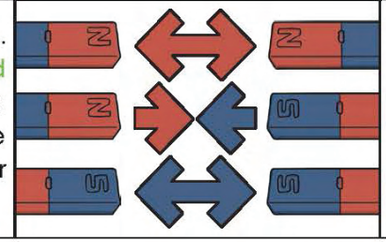
Key Knowledge



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.

Magnetic ✓

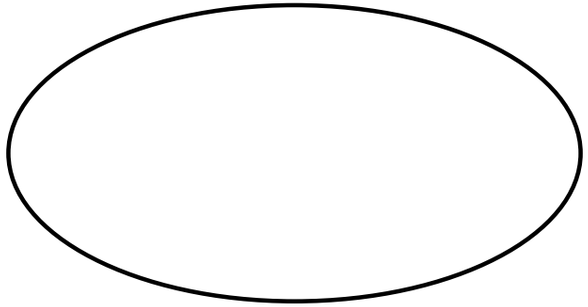
These objects contain iron, nickel or cobalt. Not all metals are magnetic.

Non-magnetic ✗

These objects do not contain iron, nickel or cobalt.

National curriculum	Forces and magnets
Year 3	compare how things move on different surfaces
Year 3	notice that some forces need contact between two objects, but magnetic forces can act at a distance
Year 3	observe how magnets attract or repel each other and attract some materials and not others
Year 3	compare and group together a variety of everyday materials on the basis on whether they are attracted to a magnet, and identify some magnetic materials
Year 3	describe magnets as having two poles
Year 3	predict whether two magnets will attract or repel each other, depending on which poles are facing

Mind Map



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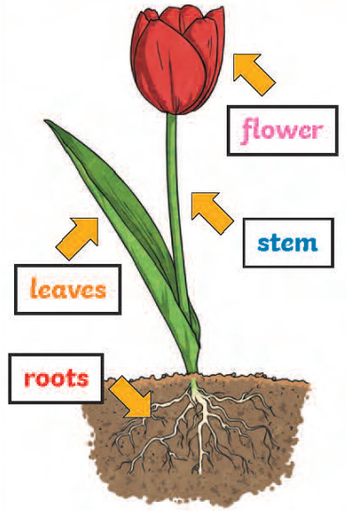
Science - Summer Term 1

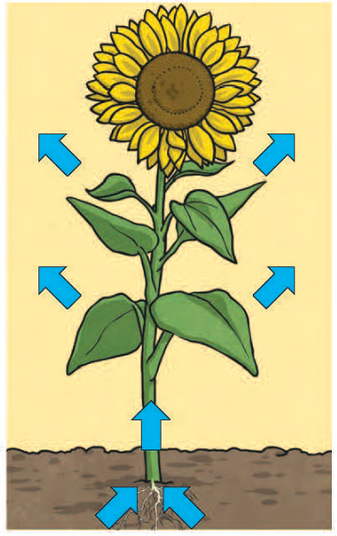
Plants

What do plants need to become strong and healthy?	Answer
What parts of a plant do we eat?	Answer
What are the different methods of seed dispersal?	Answer
What is the important role a bee plays in a plant's life?	Answer
How do plants obtain water?	Answer
What would happen if all the plants on Earth suddenly died?	Answer

Key Vocabulary	
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 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.



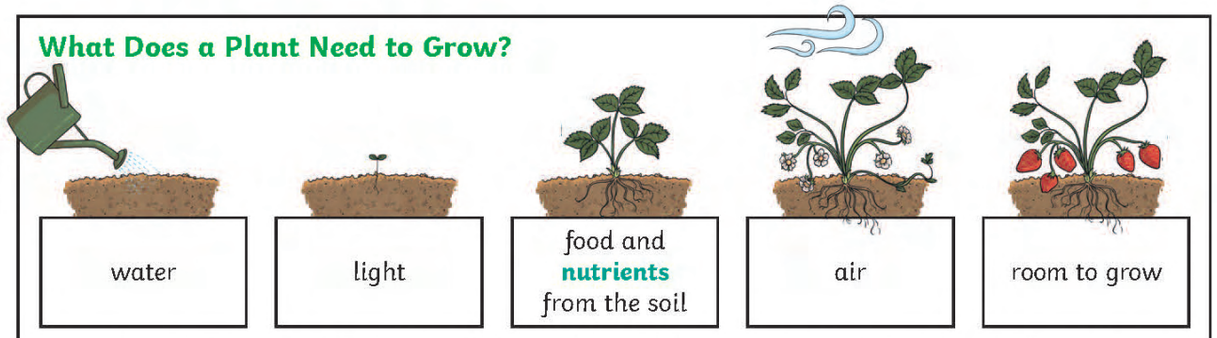
How Water Moves through a Plant



1. The **roots** absorb water from the soil.
2. The **stem** transports water to the **leaves**.
3. Water **evaporates** from the **leaves**.
4. 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.

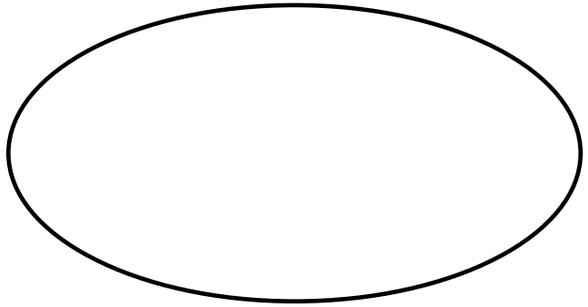
What Does a Plant Need to Grow?



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.

National curriculum	Plants: roots and shoots
Year 2	observe and describe how seeds and bulbs grow into mature plants
Year 2	find out and describe how plants need water, light and a suitable temperature to grow and stay healthy
Year 3	identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
Year 3	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
Year 3	investigate the way in which water is transported within plants
Year 3	explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal

Mind Map



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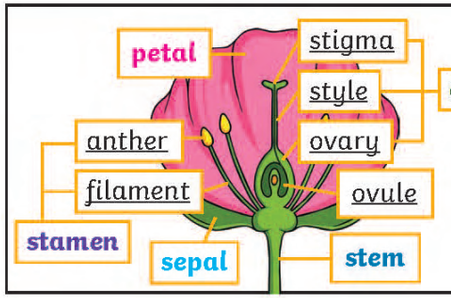
Science - Summer Term 2

Pollination and Seeds

What do plants need to become strong and healthy?	Answer
What parts of a plant do we eat?	Answer
What are the different methods of seed dispersal?	Answer
What is the important role a bee plays in a plant's life?	Answer
How do plants obtain water?	Answer
What would happen if all the plants on Earth suddenly died?	Answer

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.



The flower's job is to create seeds so that new plants can be grown.

Life Cycle of a Flowering Plant

Germination
The seed starts to grow.

Growing and Flowering
The plant grows bigger and forms a flower.

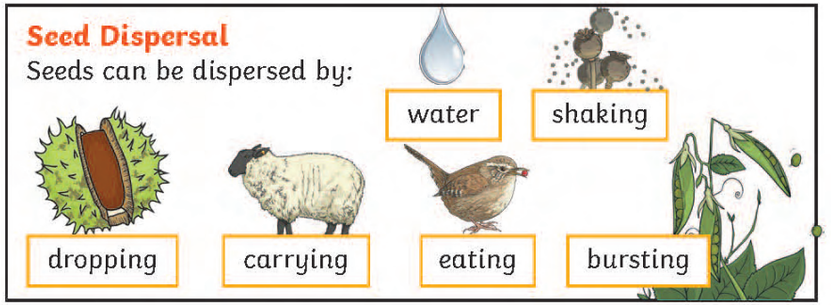
Pollination
Pollen from the anther lands on the stigma and travels down the style.

Fertilisation and Seed Formation
The pollen joins with an ovule and a seed starts to form.

Seed Dispersal
The fully formed seeds are moved away from the parent plant.

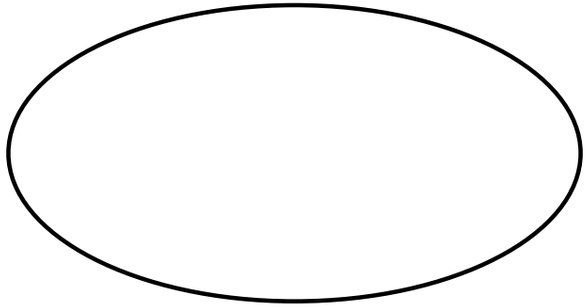
Seed Dispersal

Seeds can be dispersed by:



National curriculum	Plants: flowers and fruits
Year 2	observe and describe how seeds and bulbs row into mature plants
Year 2	find out and describe how plants need water, light and a suitable temperature to grow and stay healthy
Year 3	identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
Year 3	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
Year 3	investigate the way in which water is transported within plants
Year 3	explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal

Mind Map



Before starting the topic, add what you already know.

What is this picture telling me?

Show what you know. Recall two things on the topic.	Connect - can you link this to one more thing that you know.
1.	
2.	

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1.	
2.	