

Science

Knowledge Organisers

Summer One



Hanslope Primary School Science Knowledge Organiser

Year One - Plants

What key vocabulary will I learn:

Plants are made up of many different parts.

Roots – Roots absorb water and minerals from the ground. They also help the plant to stay standing in the ground.

Stem – The stem supports the plant above the ground. It also helps to carry water and minerals from the roots to the leaves.

Leaves – Leaves collect energy from the Sun and turn this into food for the plant (photosynthesis).

Flowers and Fruits – Flowers and fruits help the plant to reproduce (to make more plants).

Seed – Flowering plants begin life as seeds. They need soil, air and water to grow.

Seedling – When the plant first starts to grow, it is called a seedling.

Flowering – When the plant is fully grown, it will produce its own flowers. These flowers will eventually produce seeds. When the seed gets to the ground, the cycle starts again.

Tree - Trees are tall, woody plants. They usually have a stem called a trunk.

Bushes and shrubs - Bushes and shrubs are quite low plants that have lots of branches.

Moss - Mosses are small, seedless plants that grow in moist places.

Vegetables - Vegetables normally come from a type of plant called a herbaceous plant. Vegetables can be eaten.

Deciduous - trees which lose their leaves in the winter

Evergreen – Trees which keep their leaves through the year

National Curriculum Links:

- Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees
- Identify and describe the basic structure of a variety of common flowering plants, including trees.

How does this link to my future learning?

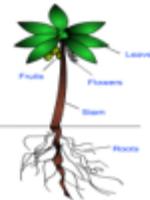
- Observe and describe how seeds and bulbs grow into mature plants
- Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

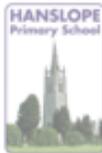
What will I know by the end of this unit:

- Plants are a large group of living things that use sunlight to make their own food.
- There are many, many different kinds of plants, including trees, vines and grasses.
- Plants have lots of different parts, for example stems, leaves and roots.
- Some plants are 'flowering plants' – they grow flowers sometimes.
- Flowering plants produce flowers to help them reproduce. They follow a life cycle.

Examples of deciduous trees are oak, maple, elm, beech, sycamore

Examples of evergreen trees are pine, fir, holly





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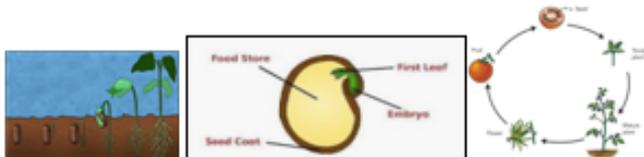
Year Two - Plants

How does this link to my previous learning?

Plants are a large group of living things that use sunlight to make their own food. There are many, many different kinds of plants, including trees, vines and grasses. Plants have lots of different parts, for example stems, leaves and roots. Some trees lose their leaves in the winter (deciduous). Some keep their leaves through the year (evergreen). Some plants are 'flowering plants' – they grow flowers on them.

What key vocabulary will I learn:

Plants have a clear life cycle that helps them to keep reproducing:
Seeds/bulbs – Plants begin life as seeds or bulbs. They need soil, air and water to grow.
Seedling – Plants grow into young plants. They now need light, temperature, water, space and time to keep growing.
Flowering/Fruit – Plants grow flowers and fruits. These produce seeds. When the plant dies or is pollinated, the seeds find their way to the soil. The process starts again!
Germination is the name for when a plant starts to grow. A plant is germinating when its seed begins to sprout.
Inside a seed/bulb is the baby plant (an embryo). Seeds have a tough layer on the outside to protect the plant (the seed coat).
Seeds and bulbs do not need sunlight in order to grow. They already have their own food store inside them!
However, they do need the right conditions to grow. Normally, they need water, air and the right temperature. This can often be found in well-watered soil!



National Curriculum Links:

Observe and describe how seeds and bulbs grow into mature plants
Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

How does this link to my future learning?

Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
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
Investigate the way in which water is transported within plants
Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

What will I know by the end of this unit:

What plants need to grow

Water and Nutrients:

Like animals and humans, plants need water and nutrients to survive.
Plants are able to get water from the soil through their roots.
They can also catch water on their leaves.

Light:

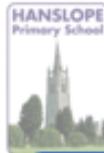
Plants need lots of sunlight to help them grow.
Plants do not eat food. They instead use sunlight to make their own food.
Too little light will leave plants weak.

Temperature:

Plants need the temperature to be just right for them to grow properly.
If it is too hot, they may burn and wilt. If it is too cold, they may freeze and die. This is why there are less plants at the poles and the deserts.

Space and Time:

Plants need room for their roots and stems to be able to grow. Without enough room, they may not grow large enough.
Plants also need time – it can take days, months or even years for them to grow.



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Year Three - Plants

How does this link to my previous learning?

- Plants need a number of different things in order to grow, including water and nutrients, light, the right temperature, space and time.
- Plants begin life as seeds or bulbs. Seeds do not need sunlight as they have their own food store.
- Water and oxygen allow seeds and bulbs to germinate (start to grow).
- Plants have a life cycle, that includes the seed, seedling and flowering stages.

What key vocabulary will I learn:

Roots

- The roots grow into the ground. They are responsible for pulling water and minerals to the plant.
- They expand into the ground to widen the area they can find water. They also help to anchor the plant into the ground.

Stem/Trunk

- The stem/trunk carries the water and nutrients up to the leaves.
- The stem also carries food from the leaves to the rest of the plant.
- Stems grow upwards, reaching up for the sun.

Leaves

- Leaves are responsible for catching sunlight. They also allow both air and water to enter the plant.
- Leaves have veins inside them, to allow water and nutrients to flow.

Flowers

- Flowers are the parts of plants that are responsible for making both food and seeds.
- The petals of a flower attract insects for pollination. The flower has male and female parts, which work together to make seeds. are many different sizes & shapes of leaves, to fit the plant's needs.

National Curriculum Links:

- identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
- 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
- investigate the way in which water is transported within plants
- explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

What will I know by the end of this unit:

Flowers play an important role in the reproduction of plants.

-The male part of a flower is called a **stamen** – it is made up of a **filament** and an **anther**. The anther contains **pollen**.

-The female part of a flower is called a **carpel**. It is made of a **stigma**, a **style** and an **ovary**.

-When the male pollen lands on the female stigma **pollination** occurs.

-This process means that a **seed** is produced.

-Insects are drawn to flowers by bright petals. When they feed on the flower's nectar they are dusted with pollen. They then spread this to other places when they leave

-Plants need **air, light, water, nutrients, temperature** and **space** in order to live and grow. The amounts needed of each of these requirements varies from plant to plant.

-A plant that is kept in a dark place will grow tall and spindly, as it searches for light.

-A plant that is not watered will have a weak stem. Its leaves will dry up and eventually it will die.

-A plant that is not given enough space will have stunted growth, and may die if it cannot reach enough light.

-A seed will not germinate at all if the temperature is too cold.



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Year Four - Sound



National Curriculum Links:

- Identify how sounds are made, associating some of them with something vibrating
- Recognise that vibrations from sounds travel through a medium to the ear
- Find patterns between the pitch of a sound and features of the object that produced it
- Find patterns between the volume of a sound and the strength of the vibrations that produced it
- Recognise that sounds get fainter as the distance from the sound source increases.

What key vocabulary will I learn:

Pitch is the highness or lowness of sounds.

Pitch is caused by the frequency of vibrations (how many times vibrations go back and forth per second).

The higher the rate of vibrations, the higher the pitch.

Lower pitch sounds have a lower rate of vibrations.

Humans can hear a large range of pitches, high-pitch sounds e.g. a mouse squeak to low-pitch sounds e.g. the rumble of an earthquake.

However, some sounds are too high or low-pitched for us to hear.

Volume is the loudness of a sound.

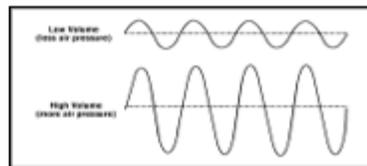
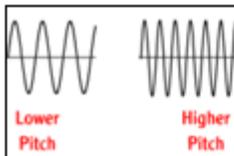
The volume of a sound depends on the amount of energy that the vibrations contain.

Vibrations with lots of energy create large soundwaves.

When these large soundwaves arrive at your ears, they push harder on your eardrums.

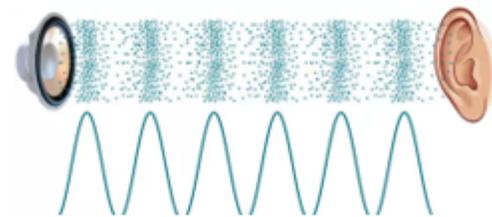
This is why when we strike a drum harder (with more energy) it is louder than when we strike it more softly.

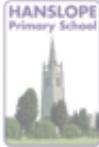
-Our ears can detect a wide range of loud and quiet sounds, from rumbling jet engines to leaves rustling.



What will I know by the end of this unit:

- Sounds are made when objects vibrate (shakes back and forth).
- Vibrations travel from objects in waves to our ears, allowing us to hear sound.
- When a bell is struck, the metal of the bell vibrates. These vibrations create waves in the air (sound waves). When they reach our ears, they make our eardrums vibrate, and we hear the sound of the bell ringing.
- Weak vibrations make a gentle soundwave which do not travel as far as strong vibrations. This is why sounds have different volumes.
- Sounds can be high pitched or low pitched. Tight, short frequency waves make a high-pitched sound, while more loose waves make low-pitched sounds.





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Year Five – Living Things and their Habitats

How does this link to my previous learning?

- Recognise that living things can be grouped in a variety of ways
- Explore and use classification keys to help group, identify and name a variety of living things.
- Recognise that environments can change and that this can sometimes pose dangers to living things.

What will I know about plants by the end of this unit:

Plants are able to reproduce in two ways – sexual reproduction and asexual reproduction

Sexual reproduction in plants is cyclical, following this process:

1. Germination – The plant begins to grow from a seed. Roots form under the soil and a stem, leaves and flower shoots above the surface.

2. Pollination – Pollen produced by the flower is carried by insects or blown by the wind to another flower.

3. Fertilisation – The pollen reaches another flower and makes its way to the ovary, where it is fertilised.

4. Dispersal – The seeds are scattered by animals or the wind.

Asexual reproduction involves plants producing an identical copy of themselves.

This can happen in a number of different ways. Some plants are able to produce bulbs (e.g. daffodils and snowdrops). Others, like potatoes produce tubers. Tubers lie below the soil, and grow into plants the next year.



National Curriculum Links:

- Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
- Describe the life process of reproduction in some plants and animals.

How does this link to my future learning?

- Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences.
- Give reasons for classifying plants and animals based on specific characteristics.

What will I know about animals by the end of this unit:

A life cycle is the series of changes that an animal goes through in its life, including reproduction.

<u>Mammals</u>	<u>Amphibians</u>	<u>Insects</u>	<u>Birds</u>
Mammals have a 3-stage life cycle:	Many amphibians have a 5-stage life cycle:	Most insects undergo metamorphosis and have a life cycle of 4 stages:	Birds have a 3-stage life cycle:
Stage 1: The gestation period – the embryo grows inside the mother & is dependent on her.	Stage 1: Female lays eggs, fertilized by the male.	Stage 1: Eggs laid by female insect.	Stage 1: Eggs laid by the mother. Parents care for the egg until hatching.
Stage 2: The young mammal grows and develops independence.	Stage 2: Tadpole breathes in water through gills.	Stage 2: Eggs hatch into larva, e.g. caterpillars, maggots, grubs.	Stage 2: Mother and father feed the bird until it is independent.
Stage 3: Adult mates in order to reproduce.	Stage 3: Grows fins and develops lungs.	Stage 4: The pupa (hard coating) is formed. Inside this, the larva transforms.	Stage 3: Adult mates in order to reproduce.
	Stage 4: Tadpole grows front legs. Jumps from water onto land.	Stage 5: The adult breaks out of the pupa and matures.	
	Stage 5: Starts to eat insects/plants. Takes 2-4 years to become adult.		



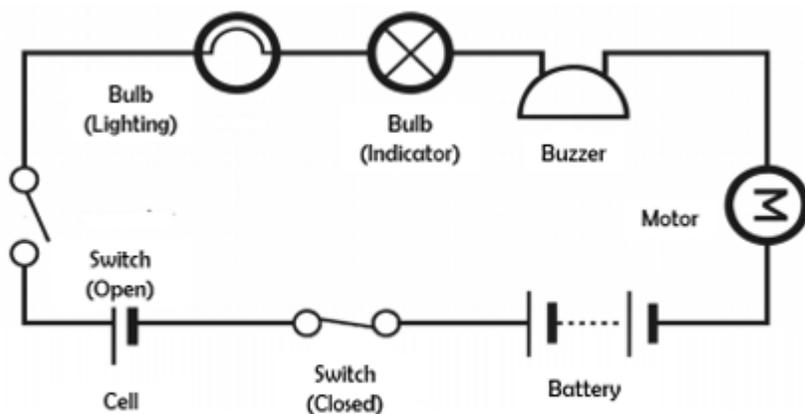
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Year Six - Electricity

How does this link to my previous learning?

Identify common appliances that run on electricity
Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery
Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
Recognise some common conductors and insulators, and associate metals with being good conductors

What key vocabulary will I learn:

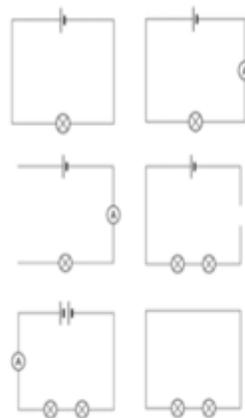


When drawing electrical circuits, you should use the standard symbols to show the different components.

National Curriculum Links:

Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches
Use recognised symbols when representing a simple circuit in a diagram.

What will I know by the end of this unit:



When changes are made to circuits, components can function differently:
-When switches are open or wires are removed from a circuit (so that it is no longer a closed circuit), bulbs and buzzers will turn off. You can use crocodile clips to investigate adding and removing wires.
-When more batteries or cells are added (or batteries or cells are included with a higher voltage) the brightness of bulbs and the volume of buzzers will increase.
-When more bulbs are added to a simple circuit, they will be dimmer than if there were one bulb. This is because the electricity is shared between the two bulbs. More voltage would be needed to make them brighter. You should be able to look at circuits like those on the left, and work out what would happen.