Kindness Positivity Respect

SCIENCE MEDIUM TERM PLANNING		
Year Group: 3	**Term:** Summer 2	**Theme:** Plantastic (plants)
National Curriculum Substantive Knowledge: - 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		
National Curriculum Working Scientifically/Disciplinary Knowledge: - make systematic and careful observations - record findings using simple scientific language, drawings, labelled diagrams - use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions		
Context: Previously in year 2 children have learnt that plants can grow from seeds and bulbs. They have named the main parts of flowering plants and investigated which conditions plants need to grow healthily. Children have begun to study the main stages of the lifecycle of a plant from seed to mature, flowering adult plant. In Year 3 children develop their understanding of the parts of a plant by learning about the functions	**Concepts:** **Plants** Plants are living organisms that are capable of converting energy from the sun into the energy they require to grow through the process of photosynthesis. They require certain conditions to grow which vary from plant to plant.	**Vocabulary:** nutrients, reproduce, function, transport, pollinate, disperse, life cycle, requirements for growth

of roots, stem, leaves and flowers. They also explore the lifecycle of a plant in more detail by learning about the processes of pollination, seed formation and seed dispersal.		

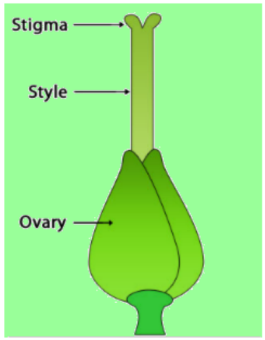
Prior Knowledge . Year 2 – Pupils will: - Describe how seeds and bulbs grow into mature plants - Know that plants need water, light and a suitable temperature to grow and stay healthy	**Future Knowledge**: Year 4 – Habitats. Children learnt that plants are the starting point of food chains (producers) and that plants are essential an essential part of different habitats.

End points /by the end of this unit pupils will... (NB Crucial/sticky knowledge is highlighted):

- 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)
- explain the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal

Learning Objective	Teaching Input/ Activities	Key Questions	Resources
To identify 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	What can we remember about plants from KS1? What do plants need to grow? (air, light, water, nutrients from soil, and room to grow) Draw and label parts of a plant. (roots, stem/trunk, leaves and flowers) What is botany? Botany is a part of Science and is the study of plants. We are going to become botanists To do this you must know what plants need to survive and how to look after them. Recap what plants need to grow – water, air, nutrients, light, space, correct temperature, time. Introduce the challenge – keep your plants alive! Challenge Rules		Plants e.g. geranium (1 per child) Compost Plant pots

Disciplinary Knowledge use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	1. Only you can look after your plants - don't ask a friend to do it! 2. Plant care is not to be done in lesson time. Each child is given a plant and access to plant pots, compost and water. Allow children time to pot and set up their plant. Recap parts of plants – roots, leaves, stem/trunk, flower, seeds. What are the functions of these parts? Roots – take in nutrients and water. Leaves- change light into energy (photosynthesis) Stem/trunk- transports water and nutrients Flower – attracts insects, holds pollen and makes the seed Seed – what a new plant grows from. Do all plants look the same? Do all plants have all the different plants that we have learnt about? Watch video on different plants https://www.youtube.com/watch?v=-dBfiIQpYeg Task – In groups take a photograph of 3 different plants. On each plant can you label a root, leaf, stem, flower, fruit?		
Unique plants. To identify whether all plants have these different parts: roots, stem/trunk, leaves and flowers. Identify that not all plants live in the same environments.	Can the children identify and name some common trees and flowers? Show pictures/real examples of oak, sycamore, horse chestnut leaves and poppy, rose, dandelion, daisy flowers. Watch Unique and weird plants video https://video.link/w/ghPvd What is unusual /different about each plant? Venus fly trap – **leaves** are hinged and can close when a fly lands on them. Dancing plant – **leaves** can move/dance when it senses sound vibrations.		

	Corpse plant – **flower** is taller than a person and smells like a dead animal. Bottle tree – **trunk** can store over 300l of **water**. Shy/sensitive plant – **leaves** will curl up when touched. Resistant plant - has **2 leaves** and a sturdy **stem**. It can live for up to 5 years without **water**. World's largest **flower** - weighs 15 - 24 pounds and smells like rotting meat. Baseball plant – has 1 round **stem**. Children match the descriptions to the correct plant. **Do all these plants have all the parts that you have learnt?** (Roots, stem, flower, leaves) **Do these parts look the same on every plant?**		
Identify and describe the functions of different parts of flowering plants: **flowers** Explore the part that **flowers** play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal Disciplinary Knowledge make systematic and careful observations record findings using simple scientific language, drawings, labelled diagrams	Recap KS1 learning - flowers have petals to attract insects. In KS2 we learnt that a flower is made up of many parts. In most flowers there are males and female parts. Introduce the children to the different parts of a flower: Female parts: Carpel, Stigma (collects pollen), style (pollen grain travels down style to ovary), ovary (develops into the seed) The female part of the flower is called the **carpel.** It is made up of the **stigma** **style** and **ovary** Diagram of a carpel  Sometimes the carpel is called the pistil.		Examples of flowers with different numbers of petal, stamen and carpels.

The stigma is at the top

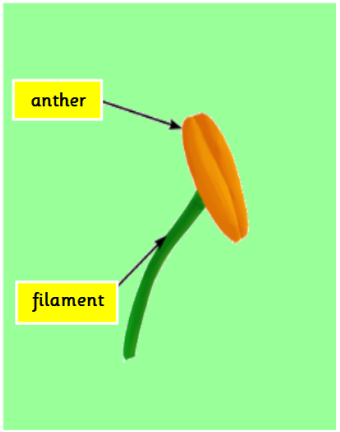
The style is the long tube connecting with the ovary which can't be seen

Male parts: stamen, anther (produce pollen), filament (stalks that hold up the anthers)

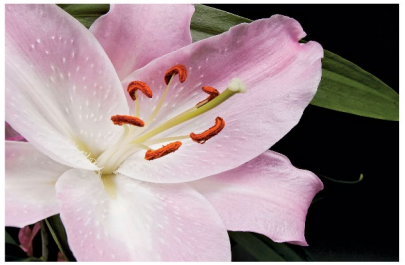
The male part of the flower is called the **stamen**

It is made up of the **anther** and **filament**

Diagram of a stamen



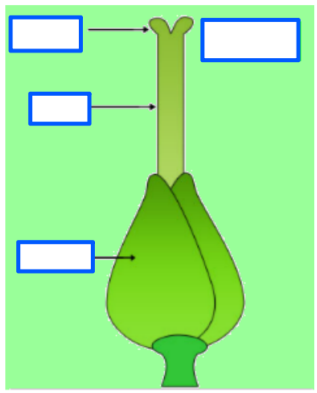
There are 6 stamen inside this flower.

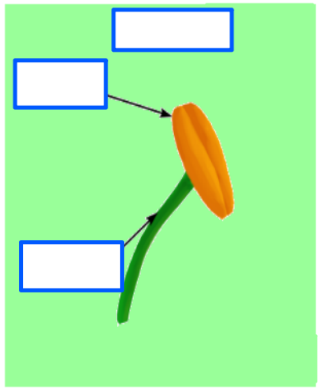


Can you see the white filaments and the brown anthers carrying pollen?

Children label the parts of a flower on a diagram

<u>Parts of a flower</u>

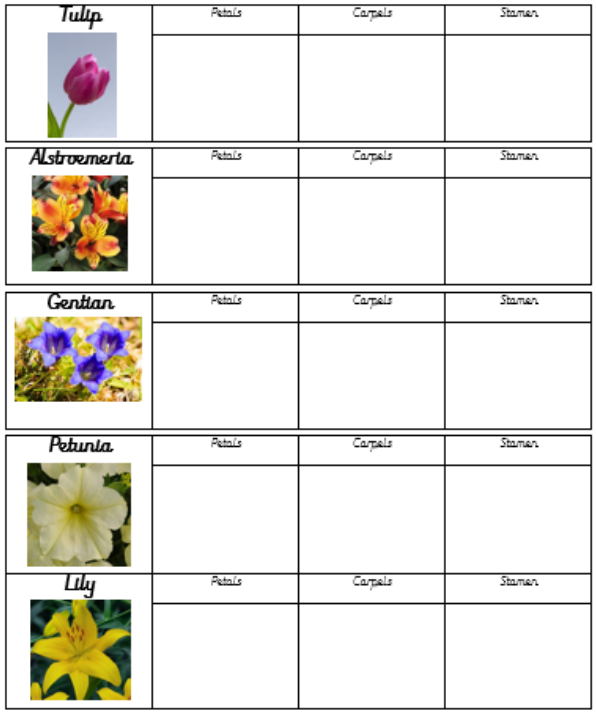




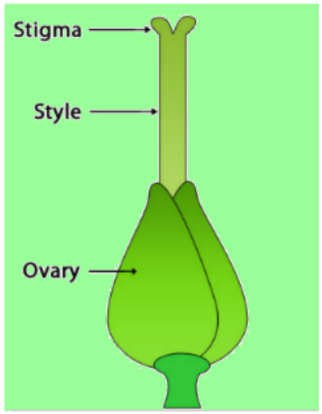
Do all flowers look the same?

Flowers can have a single carpel or multiple carpels. Flowers can also have different numbers of stamen.

Give the children a selection of different flowers. Can they identify how many petals, carpel and stamen each flower has?

	WALT Observe Flowers We used magnifying glasses to observe the parts of different flowers in detail.  Tulip / Petals / Carpels / Stamen Alstroemeria / Petals / Carpels / Stamen Gentian / Petals / Carpels / Stamen Petunia / Petals / Carpels / Stamen Lily / Petals / Carpels / Stamen		
Pollination Explore the part that flowers play in the life cycle of flowering plants, including **pollination**, seed formation and seed dispersal	Plants need to make more plants (reproduce) as part of their life cycle. Flowering plants do this by making seeds. Pollen travels from one plant to another, travels to the ovary and seeds are formed in the process of POLLINATION.		Lilies with pollen

The Female Part of the Flower



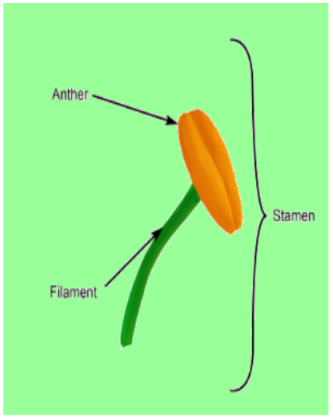
How Are Seeds Formed?

This is the female part of the flower and it is called the carpel. Sometimes it is called the pistil.

Inside the part called the ovary are ovules. These ovules will turn into seeds when they are fertilized with pollen.

When the flower makes seeds they can be dispersed and a new plant can grow.

The Male Part of the Flower



How Are Seeds Formed?

This is the male part of the flower. It is called the stamen.

On top of the part called the anther are tiny specks of pollen.

The pollen must travel to the female part of a flower and enter the stigma, travel down the style to the ovary and fertilize the ovules.

This is called POLLINATION

Watch BBC teach video:
https://www.youtube.com/watch?v=A5Pf4_LXyC4

How does the pollen travel from one plant to another?

Insects are most often the ones to help plants to pollinate by carrying the pollen from flower to flower on their bodies. The pollen brushes on and sticks to them as they collect nectar. Pollen can also be carried by the wind.

	Watch video explaining how to draw a pollination diagram https://video.link/w/fpXwd Children make their own diagrams showing insect pollination.		
Seed dispersal Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and **seed dispersal** Disciplinary Knowledge make systematic and careful observations record findings using simple scientific language, drawings, labelled diagrams .	Once the flower is pollinated, the pollen travels down the style to the ovary. It then fertilisers the ovule and a seed begins to form. In some plants a fruit forms around the seed. Watch time lapse video of a pear forming on the tree. https://www.youtube.com/watch?v=SHHkmOh942A **Why would the plant make fruit?** Fruit is eaten by animals, the seeds are either eaten or discarded somewhere else. The dispersed seeds can then grow in a different location to the parent plant (providing they have the correct soil, water, light, temperature, sapce). **Are there any other ways a seed can be dispersed?** Watch bbc video. How many different dispersal methods can the children spot? https://www.bbc.co.uk/bitesize/topics/zxfrwmn/articles/z28dpbk Wind – some seeds e.g. dandelions have fluffy heads that allow them to be carried in the wind. Other seeds e.g. sycamore have 'wings' to enable them to travel through the air. Water – some seeds e.g. coconuts float. If they drop or roll into water they can be carried to a new location. Explosion – some seed heads e.g. poppy dry out and suddenly burst open spraying the seeds. Animal (eaten) – seeds that grown inside fruits are eaten or discarded. Animal (fur) – some seeds e.g. sticky buds have spikes or hooks that get stuck in animal fur (or our clothing!) and are carried to a new location by the animal. **How do seeds get dispersed and how do we know?**		Examples of plants with different seed dispersal strategies e.g. grasses, fruits, nuts, poppy etc.

How do you think these seeds could travel away from the parent plant?

DISPERSAL

Coconuts are dispersed by water.

Sycamore seeds are dispersed by the wind.

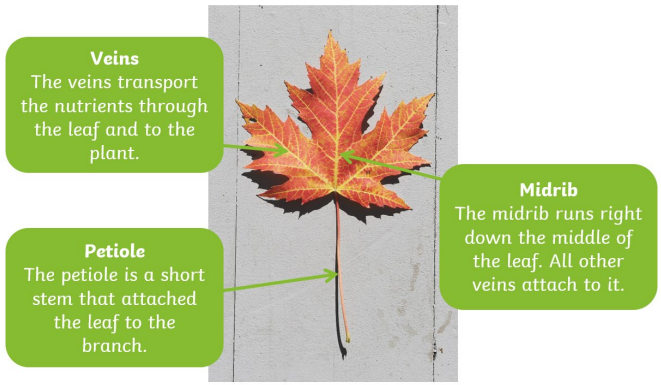
Burdock are dispersed by sticking to animals and humans.

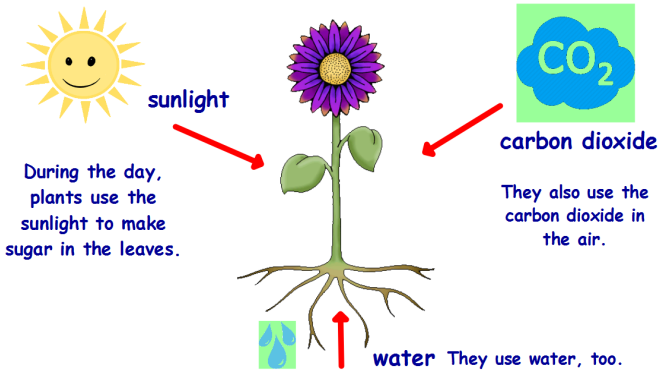
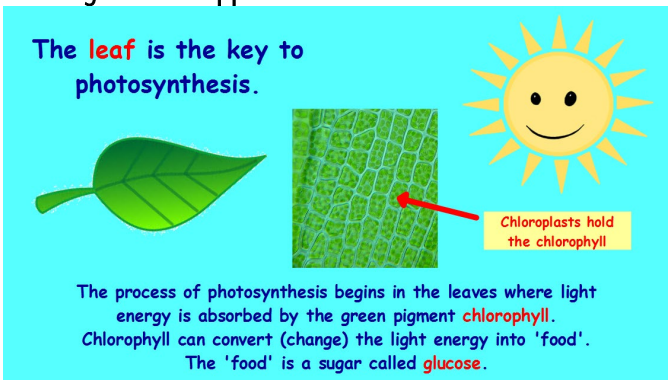
Blackberry seeds are dispersed by being eaten by animals and birds.

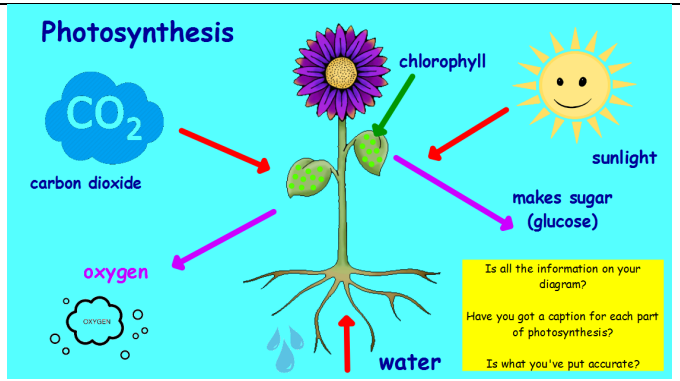
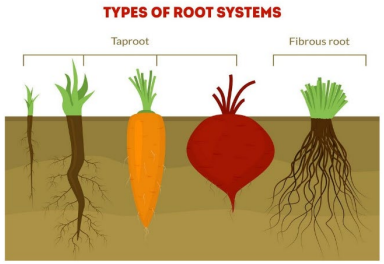
Acorns and nuts are carried away and buried by animals (to be eaten later!)

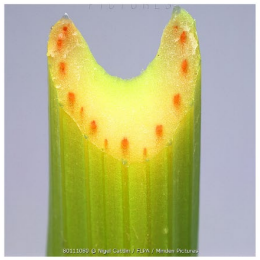
Poppy seeds are dispersed when they explode.

Task:

	On each table provide a selection of different plants with seeds. Ask the children to look carefully at each one. **Can they identify the seed? How do they think the seed is dispersed and why.**		
Photosynthesis **(function of leaves)** Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, **leaves** and flowers	Children use a magnifying glass to look very closely at the leaves of their plant (geranium). **What can you see?** Patterns? Lines? Colours? **Are both sides the same?** **Parts of a Leaf**  Can the children see the veins, petiole and midrib? The children may notice that the leaves are hairy. Plants have small hairs on their leaves and stems called trichomes. These structures are important for defence from being eaten and protection from cold, heat and drought. Introduce photosynthesis Photosynthesis is vital to continuing the life of ALL plants and animals! Photo – means light		Plants with different leaves/veins

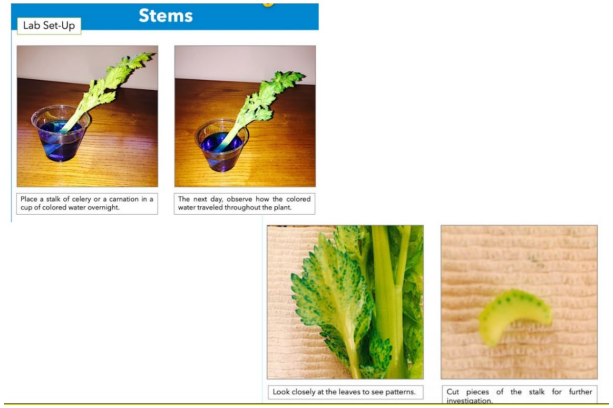
	Synthesis - means to make something So this means that plants use light to make something happen...  Oxygen is a by product of photosynthesis. **Photosynthesis happens in the leaves**  Watch bbc bitesize video explaining photosynthesis https://www.bbc.co.uk/programmes/p011t57f The photosynthesis song https://www.youtube.com/watch?v=tSHmwIZ9FNw Task – make a diagram to show your understanding of photosynthesis.		

			
Function of roots and stems Identify and describe the functions of different parts of flowering plants: **roots, stem/trunk**, leaves and flowers Investigate the way in which water is transported within plants.	Why do plants have roots? Why do plants have stems? https://www.youtube.com/watch?v=cEX3x4-dQJI&t=31s **Roots - The roots of a plant take up water and nutrients from the soil. They also anchor the plant to the ground and keep it steady.** **Stem - The stem carries water and nutrients to different parts of the plant. It also provides support and keeps the plant standing upright.** **Are all roots the same?**  **Most plants have roots that grow into the soil.** **Taproots** • They contain a single and a thick primary root known as a taproot. • Smaller, secondary roots grow from the sides of the main root. • Taproots can penetrate as much as 200ft below the ground.		Celery Plants in pots with obvious roots

	 Fibrous Root Systems • They contain numerous small roots that branch out. • In this system, large primary roots are absent. • The vast number of thread-like roots increases surface areas for absorbing water and mineral salts. Aerial Roots • They can allow a plant to attach to something such as a rock or another plant. • They can help absorb water and nutrients from the environment such as rainfall or decaying organic matter • Oxygen can be taken from the air if the soil is vey water logged or lacks oxygen **What does a stem look like inside?** **Can you see the tubes (xylem)?**  **These tubes transport water.** Set up investigations		

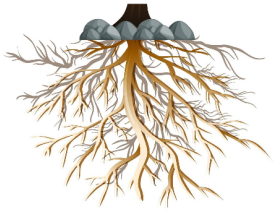
How can we see what the roots do?

How can we see what the stem does?



Consolidation task

Roots:



- Absorb [ ] and [ ] from the soil.
- [ ] the plant firmly.

- Help in storing water and nutrients.
- [ ] water and minerals to the plant.

Stems:

- Produce [ ] and [ ]
- Hold the [ ] up to the sun.
- Transport [ ] and [ ] between the roots and leaves.

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water leaves nutrients Transport

branches nutrients Anchor leaves water