Mendell Primary School

Aspire Challenge Achieve

Medium Term Plan Science

Year Group: 3	**Term:** Summer 1	**Teacher:** Jess Hindley	**Subject lead:** Sarah Bride

Common Misconceptions:

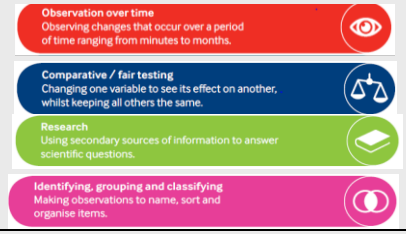
Some children may think:
plants eat food
• food comes from the soil via the roots
• flowers are merely decorative rather than a vital part of the life cycle in reproduction
• plants only need sunlight to keep them warm
• roots suck in water which is then sucked up the stem.

Unit key Vocabulary:

Photosynthesis, pollen, insect/wind pollination, seed formation, seed
dispersal (wind dispersal, animal dispersal)

Overview: Plants

- 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.



Key End Points: By the end of this unit children will be able to:

- Talk about the things that plants give us
- Observe, describe and compare plants
- Measure plants
- Describe the functions of parts of a plant
- Describe how a variety of plants need different things to live
- Describe the life cycle of plants and the role of the flower

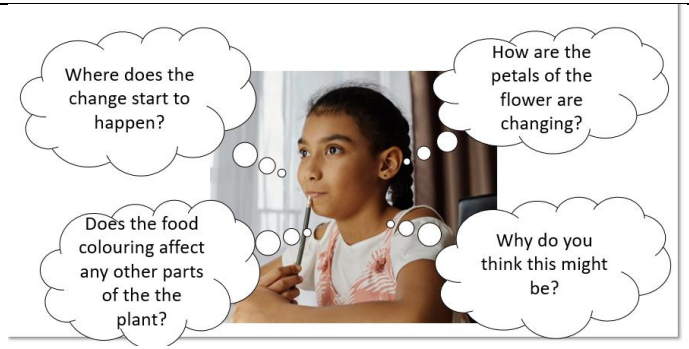
Links to other learning:	**Prior Learning:** Observe and describe how seeds and bulbs grow into mature plants. **(Y2 - Plants)** • Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. (**Y2 - Plants)** •Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. **(Year 1 Plants)**	**Future Learning:** Describe the life process of reproduction in some plants and animals. **(Y5 - Living things and their habitats)** • Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms. **(KS3)**	**High Quality Text:** The Story of Frog Belly Rat Bone by Timothy Basil Ering **Scientist to study:** **Modern:** Dr Kelsey Byers (Biologist who studies flower smells and how they attract insects) **Underrepresented:** Charles Henry Turner - search document for information (Zoologist who made	**Risk Assessment:** Handling flowers and pollen.	**Teacher CPD:** ASE plan exemplification – Max and JR Reach out CPD https://www.reachoutcpd.com/ sign up for free.

	• Identify and describe the basic structure of a variety of common flowering plants, including trees. (**Year 1 Plants)**		ground-breaking discoveries about insect behaviour) **Historical**: Jan Ingenhousz (Doctor & Scientist who discovered the process of photosynthesis)		

	Learning Intention	Lesson Outline (Key Questions in colour)	Resources	Vocabulary	Lowest 20% Adaptations
1	L.I. I can identify the main parts of a plant and describe their purpose.	**This is a Science lesson. In Science, we study nature and the behaviour of natural things. The skill we will be using this lesson is observing and communicating information.** Complete vocabulary check as pre assessment – repeat at the end of the unit. Prior learning/pre assessment thought shower children will add to this at the end of the unit – what do you already know about plants? Use the following questions to prompt the children who struggle to recall prior key learning. How many different plants can you name (can you remember what evergreen and deciduous mean?) (Y1) How do plants and seeds grow? (Y2) What do seeds and plants need to stay healthy? (Y2) Due to COVID the children may have gaps in their knowledge use the following videos to support them: https://www.bbc.co.uk/bitesize/topics/zy66fg8/articles/zcmtk2p https://www.bbc.co.uk/bitesize/topics/zpxnyrd/articles/zxxsyrd **Big Question:** what are the different parts of a plant? – assess what the children already know at this point and discuss. Watch this video telling you all about the different parts of a flowering plant: https://www.bbc.co.uk/bitesize/topics/zy66fg8/articles/zcjnp39 Why do you think some plants have flowers, and others do not? **Task:** The activity can be found here for teacher CPD: https://www.science-sparks.com/dissecting-flowers-and-more-plant-experiments/ 1) Lay your flower out over a paper plate, tray or sheet of cardboard. Can you identify the different parts? 2) Label areas of the different parts of a flower on your piece of cardboard or paper plate and stick these down. Then, write a definition of this part of the plant – why is it needed? 3) Try to find the following flower parts: root, petal, leaf, pollen, stem. 4) You can print out the labels on the PowerPoint resource for lower ability children to help. **Exit Pass:** Did you know that not all plants have flowers?	flowering plant (ideally a lily, tulip or daffodil) for each table. A paper plate or sheet of cardboard/ paper magnifying glass (optional) tweezers (optional) scissors sticky tape PowerPoint	**Plant, root, bud, bulb, stem, leaf, photosynthesis, petal, pollen, nutrient, flower, deciduous, evergreen.**	

		Have a look at the following websites to find out some really interesting facts! https://www.dkfindout.com/uk/animals-and-nature/plants/non-flowering-plants/ http://studyjams.scholastic.com/studyjams/jams/science/plants/mosses-and-ferns.htm If you can't find any flowering plants with large parts, you can use any flower for this activity. Remember to include a sentence about the purpose of each part of the flower. **Possible learning outcome for reviewing your work:** I can identify the main parts of a plant and describe their purpose.  Sometimes it can be tricky to get the roots too – don't worry about this. Just be sure that your child can identify them and explain why they're important. If you are not able to access a flowering plant, draw, label and annotate your diagram with the parts and functions of the plant. 8			
2.	L.I. I can observe the effect of putting cut white carnations or celery in coloured water.	**This is a Science lesson. In Science, we study nature and the behaviour of natural things. The skill we will be using this lesson is setting use a simple test and communicating data.** **This lesson will need to be started first thing in the morning in order to make observations throughout the day.** **Word of the week: photosynthesis.** Share the work of Jan Ingenhousz (Doctor & Scientist who discovered the process of photosynthesis) **Prior learning:** • **What is the name for trees and plants that stay green all year round?** • **What is the purpose of a plants leaves?** • **What is the purpose of a plants stem?** **Big Question: How does water travel to different parts of a plant?**	Water Food colouring Celery or white carnations Clear containers/ glasses	**Root, stem, transport, photosynthesis, nutrient.**	

		**What do we already know about how plants use water?** **What is the purpose of the root system?** **Why do plants need to transport water?** **How do you think plants transport water?** **Explorify** – zoom in zoom out – pink and white Ensure children understand that the water is absorbed by the roots of a plant and it then moves into tubes that carry the water up the plant to the leaves and flowers after discussions. Gather ideas for the following question: **How can we explore the way water travels through a plant?** Allow the children time to explore how they might find the answer. Watch this BBC Teach clip exploring how water can travel even when a cut flower has no roots! **https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-ivys-plant-workshop-how-does-water-get-from-the-roots-to-the-leaves/zdtfjhv** **Why do you think they used white flowers?** Allow children time in pairs to explore the following article about how water travels through and plant and why it is important **https://www.dkfindout.com/uk/animals-and-nature/plants/how-plants-make-food/** **Teacher CPD for task:** Watch this video explaining how to investigate the way water moves through a plant. **https://www.youtube.com/watch?v=KIug9Foou3s** If you can, use celery or white carnations (they seem to work the best!) and red or blue food colouring. **Task:** Children will make observations over time by putting a white carnation or a stick of celery into food colouring and see how water is transported in the plant. Allow the children time to set up their experiment. Once the investigation has been set up decide: **How often you will observe and record any changes?** Remember to observe at regular intervals. **Will that be every 30 minutes? Every hour? Every two hours?** **Which parts of the plant changed colour?** **Is the colour stronger in certain parts of the plant?** **Why do you think that is?** Use the recording table example on the PowerPoint ensure children draw this themselves. When making regular observations encourage the children to use the prompt questions below:	Table knives Chopping board Ipads		



Possible outcome:

Possible learning outcome for reviewing your work: I can observe the effect of putting cut white carnations or celery in coloured water

Which parts of the plant changed colour?

Is the colour stronger in certain parts of the plant?

Length of time	Describe the carnation/celery	Draw the carnation/celery
1 hr	No change	
3 hr	Slight pink colour around the centre of the carnation.	
5hr	Most of the flower is a pink colour. The edges of leaves are darker	
7hr	Flower is pink Edges are darker pink.	

Can you share the journey of the food colouring with someone else in your home?

Ensure you use the scientific words.

For example: 'The coloured water travelled up through the roots and up the stem.'

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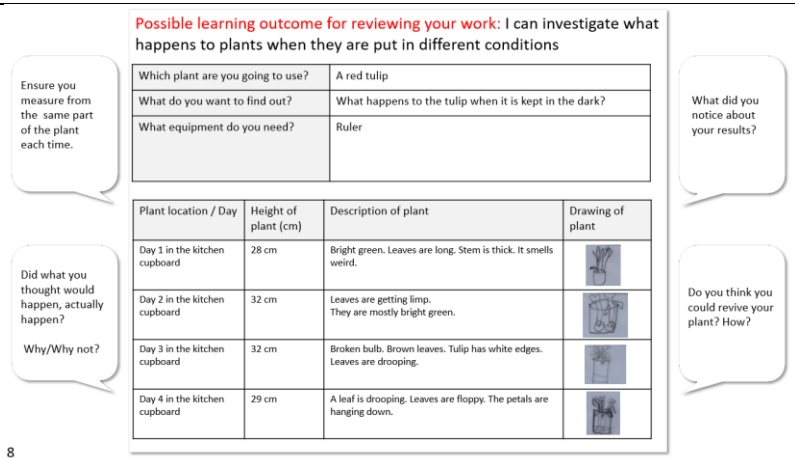
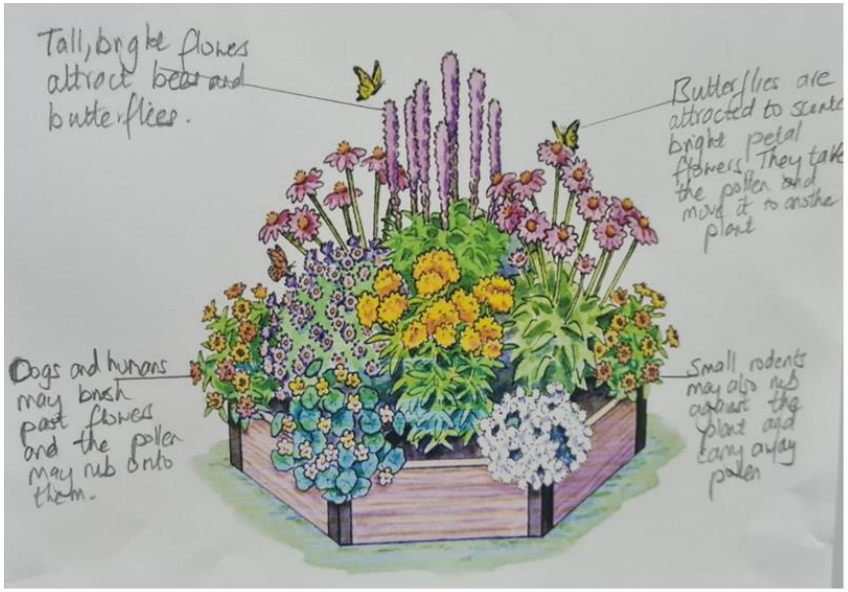
3	L.I. I can investigate what happens to plants when they are put in different conditions  .	**This is a Science lesson. In Science, we study nature and the behaviour of natural things. The skill we will be using this lesson is setting use a simple test and communicating data.** **Prior learning:** • **What parts of a plant are involved with the transportation of water?** • **What do you call plants that lose their leaves?** • **What do plants need to grow?** **Word of the week: germination** **Big Question: What happens to plants when they are put in different conditions?**	Several plants Water Measuring tape PowerPoint	**Conditions, control, germination, growth and nutrients.**	

		What do you already know about how plants grow? Watch this BBC bitesize clip: **https://www.bbc.co.uk/bitesize/topics/zy66fg8/articles/zcmtk2p** **What do you think would happen if a plant didn't have one of these conditions for growth?** **How would the plant change?** **Do you think it would still be healthy? Why? Why not?** Show the children the following video clip exploring how cacti survive without water. https://www.bbc.co.uk/bitesize/clips/z69rkqt Allow the children time to compile a list of conditions plants need to grow and stay healthy. Share and compare. Challenge them to consider why they need these conditions. **All plants need:** Light (to produce food) Air (to breathe) Water (to transport nutrients) Nutrients (through the soil) Space (to grow) Watch this BBC Bitesize clip to see what plants need to grow. **https://www.bbc.co.uk/bitesize/clips/z9f87hv** Ask the children to predict what changes they might observe to a plant that doesn't have the right conditions for growth e.g. stem/leaves floppy, stops growing, colour changes, death. Teacher CPD: https://www.youtube.com/watch?v=Lly75dEbXE8 children can watch this if you feel it is useful. **Task:** explain to the children they will take away a condition to observe what happens to the plant. allow the children to choose between taking away nutrients or room to grow. Use a control plant (the same plant with all the correct conditions), so that you can compare the changes. Use the recording sheet example on PowerPoint – children to write and draw this themselves LA can use the template if needed. **Exit Pass:** Research: **How do plants grow in the desert without water? Or How does rice grow in water filled paddy fields?**			

		 Take observations for the next four days.			
4	L.I. I can observe flowers carefully to identify the pollen and pollinators .	**This is a Science lesson. In Science, we study nature and the behaviour of natural things. The skill we will be using this lesson is making observations.** **Word of the week: pollination** **Prior learning:** • **What is the purpose of the stem?** • **What is the purpose of the flower/petals?** • **Can you name an evergreen plant?** • **Why do plants need water?** **Big Question: What is pollen and pollination?** Watch this BBC bitesize clip: **https://www.bbc.co.uk/bitesize/topics/zy66fg8/articles/zx4ktv4** Take the children onto the school field to observe the different plants growing outside. What will you be observing? Look out for any insects visiting the flowers. Which plants did they visit the most? Can you keep a record/a tally chart of this? Which insects did you see? Why were they visiting some plants more than others? Children can take a clipboard outside to make notes, drawing and annotations linked to the above questions – take photographs. Share the work of Dr Kelsey Byers (Biologist who studies flower smells and how they attract insects) Watch this BBC Teach clip: https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-ivys-plant-workshop-what-is-pollination-and-how-does-it-work/zv4df4j	PowerPoint , iPad, paper and pencils with clipboard.	**Pollen. Pollinator, pollination.**	

		Task: explain to the children that they will record all the pollinating insects they observed outside today and then design a garden to attract pollinating insects onto the school field. Children can use plants from the school grounds alongside research to select the most attractive plants for pollinators. **Example:** Possible learning outcome for reviewing your work: I can design a garden which would encourage pollinators. Can you annotate your diagram to show the areas that attract the pollinators and why?  Can you add in any other pollinators? 8 **Allow children time to plant seeds on the school grounds to attract pollinators and help the local wildlife.**			
5	L.I. I can explain why and how the seeds of plants are dispersed.	**This is a Science lesson. In Science, we study nature and the behaviour of natural things. The skill we will be using this lesson is using secondary resources to answer questions.** **Prior learning:** • **What do plants need to grow and survive?** • **Why do plants need air?** • **Can you name three pollinators?** **What do you already know about the life cycle of a plant?** – Children should draw on prior learning about germination as the start of its life cycle. Some may possibly talk about pollination from the previous lesson. Return to the life cycle at the end of the lesson to correct any errors and record in books.	Ipads, PowerPoint	**Life cycle, germination, pollination, fruit formation, seed dispersal, parent plant.**	

Explorify: **https://explorify.wellcome.ac.uk/en/activities/whats-going-on/shooting-sprouts/classroom?view-type=public**

- **Which stage of a plant's life cycle is shown?**
- **Can you name the parts of the plant?**
- **What do you think will happen next?**

Give the children the four stages of a plants life cycle and ask them to put them in the order in which they think they occur. **Can the children think of labels for each stage?** They should be able to identify germination and pollination. Now watch this clip about plant lifecycles: https://www.bbc.co.uk/bitesize/clips/zgqyrdm

Big Question: **why is seed dispersal so important for plants?**

Can you think of any ways in which seeds are dispersed? Seeds can be dispersed by animals.

- Birds and other animals often eat the fruit of a plant. The seed is not digested and can travel large distances before it is 'deposited'! Watch: **https://www.bbc.co.uk/programmes/p00lxv9z**
- Other seeds have sticky burrs or spikes. They catch on the fur or feet of animals and are carried away.
- Seeds dispersed by the **wind** often have 'parachutes' or 'helicopters' to help them.

Look at the seeds in this clip.
https://www.bbc.co.uk/programmes/p00lxw4t

Think or talk about the differences between the seeds which are dispersed by animals and by the wind. Dandelions use the wind to disperse their seeds. Watch this clip:
https://www.bbc.co.uk/bitesize/clips/zs9c87h

- Once fertilisation has taken place the plant will produce seeds.
- Plants such as dandelions often use wind to transport seeds.
- As there are so many adult plants in one place there is no space for the next generation of plants to grow.
- The dandelion therefore needs the wind to carry the seeds far away.
- The wind drops the seeds and new plants are formed and the whole process starts again.

Answer these questions about dandelions:
How does the dandelion seed travel?
What device does it have to help it to move?
Why does the dandelion seed need to move?
What happens when the seed is dropped?
Task: Now try asking and answering your own questions about blackberry seed dispersal. Use the example below children record themselves.

Dandelions are an example of seed dispersal by the wind. Blackberries are an example of seed dispersal by animals.

There are many possible questions you can ask about how and why seeds are dispersed.

You may like to think about questions for other plants you saw in the clips.

Possible learning outcome for reviewing your work. I can explain why and how the seeds of plants are dispersed.

Dandelion seed dispersal questions	**Answers**
How does the dandelion seed travel?	The dandelion seed travels by being picked up by the wind.
What device does it have to help it to move?	The dandelion seed has a parachute to help the wind move it like an umbrella.
Why does the dandelion seed need to move?	The area is too packed with plants for any new seeds to grow there so it must move away.
What happens when the seed is dropped?	The seed will drop and germinate and the roots will anchor into the soil.
Blackberry seed dispersal questions	**Answers**
Which type of animal helps to disperse blackberry seeds?	Birds help to disperse blackberry seeds by eating them.
Why do the fruits of blackberries turn black when they are ripe?	Birds are attracted to colours which they can see easily, like black and red.
Why do birds eat lots of blackberries?	The blackberries taste sweet and are a good food source for the birds.
What happens to the fruit after it is eaten?	The flesh is digested by the bird. The seeds are not digested and are 'pooped out' later.