SS John Fisher & Thomas More Catholic Primary School

A Voluntary Academy

Year Group: Year 3 & Year 4	Term: Summer 2 (Cycle A)	Topic: Plants

National Curriculum Links

Pupils in Key Stage Two should be taught to:

- 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.

Working Scientifically

- ask relevant questions and using different types of scientific enquiries to answer them
- set up simple practical enquiries, comparative and fair tests
- make systematic and careful observations and, where appropriate, take accurate measurements using standard units and a range of equipment
- gather, record, classify and present data in a variety of ways to help in answering questions
- record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identify differences, similarities or changes related to simple scientific ideas and processes
- use straightforward scientific evidence to answer questions or to support their findings.

Prior Learning	Future 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)	• 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)

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.**

Sustainable Development Goals & Catholic Social Teaching

Sustainable Development Global Goals would be perfect to fit with this unit of learning:

These Catholic Social Teaching strands would be perfect to fit with this unit of learning:

Applied Write Opportunities	Enrichment Opportunities
In English lesson, children write a diary entry from the perspective of a bee, including their scientific understanding about the life cycle of a flowering plant.	

Assessment Opportunities

- Can explain observations made during investigations
- Can look at the features of seeds to decide on their method of dispersal
- Can draw and label a diagram of their created flowering plant to show its parts, their role and the method of pollination and seed dispersal

Key Vocabulary

Tier Two:

Tier Three:

Knowledge and Skills Objectives	Activity	Differentiation
Lesson One I know and can describe the functions of different parts of flowering plants. Working Scientifically	**Prior Assessment Task:** Children to go outside and find as many different plants as they can, taking photos of them so that they could talk about them back in the classroom. Can children identify not only flowers, but trees, grass, bushes etc? Children to make a PicCollage for their book. **Hook:** **Display as a slide share, images of the plants they found whilst exploring outside.** **Big Question:** ***Why are plants important?*** **TTYP** **Explain that without plants, there will be no life on Earth.** **When green plants make food, they give off oxygen. This is a gas that all animals must breathe in order to stay alive. Without plants, animals would have no oxygen to breathe and would die. People and animals depend on plants for food too.** **Introduction:** **Show the children a selection of plants, and ask them;** ***What are the different parts of a plant called?*** **Children to discuss the different parts of the plant are and if they know what the functions are of each part.** **Children to make a playdough 'plant' on a wipe-board and ask them to label it and record what they know about each part of the plant - pre-assessment: children learnt this in KS1.** **Take photographs for evidence. These can be stuck into their journals.**	Activity 1: Draw, label and write about the different functions of a plant. SEND: Children to have a pre-drawn image in interactive skeleton book. Children to label the image using a word bank and write a simple sentence about each part e.g. A stem holds up the plant. A leaf helps the plant make food. Main Activity Children to draw and label an image of a plant. Children to write about the function of each part of the plant using scientific vocabulary.

Resources

Ipads
Playdough
Wipe-boards
Information packs for groups
Interactive skeleton books
Fact sheets on types of plants

Activity 1:

Explain that they are going to learn more about the different parts of a plant and their functions.

Put the children in groups of 4. Each child to be nominated to be a part of a plant and given information and images about it. (The information can be differentiated to support reading abilities.)

Following this, children have to explain the function of their named part to the rest of their group, ensuring they explain key scientific vocabulary.

Children to record what they had learnt about the main parts of the plant in their 'Interactive Skeleton Book'.

Activity 2:

Watch the video of the parts of a plant song and act it out in groups.
https://www.youtube.com/watch?v=qI6OL7_qFgU

Take videos of the children acting it out.

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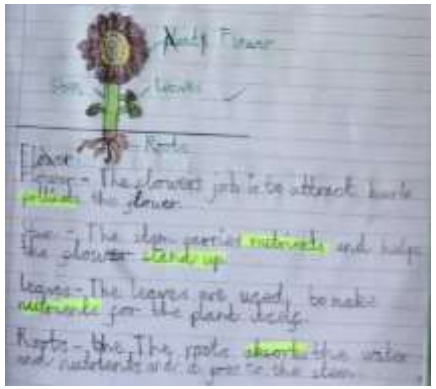


Challenge:

Children to read the following text on types of plants.

Children to answer the following questions:

1) What are the two types of plants that make seeds?
2) How do flowering plants make seeds?
3) What type of plant has no roots?
4) What is a spore?

		Plenary Use the following BBC Bitesize website to consolidate what the children have found out today. Play the quiz at the end of the webpage. https://www.bbc.co.uk/bitesize/topics/zy66fg8/articles/z2d4g7h
Knowledge and Skills Objectives	**Activity**	**Differentiation**
Lesson 2: I can explore the requirements of plants for life and growth. Working Scientifically	**Prior Assessment Task:** **Ask the question;** ***What is a plant? TTYP*** **On a wipe-board, children to use a 'Quick Write' paragraph to answer the question.** **Children to share their paragraphs.** **Consolidate that p**lants are living things that grow from the soil and turn light from the Sun into food. Plants can be big or small, from giant trees to tiny	Activity 1: Name the things plants need in order to grow, and write a sentence to explain this in their Interactive Skeleton Book.

	Big Questions: **Display this 'Big Question' from Explorify.** https://explorify.uk/en/activities/the-big-question/how-can-you-tell-if-something-is-a-plant Discuss unlike animals, plants tend to live out their life cycle (germinate, grow, reproduce) in one place. The defining character of life is the ability to grow, reproduce and die. How are plants different from other living things? Here are a few examples: • Plants are usually green. • Plants are immobile and do not migrate. • Plants make their own food using sunlight. • Plant cells are different from animal cells. **Introduction:** **Show the children a plant you have brought in from home that was dying and ask the children to discuss what you might have done wrong. Children to share their thinking with their partner.** **Explain to the children that plants need lots of different things to be able to grow. Ask;** ***What do plants need in order to grow? TTYP*** **In pairs, children to make a list of these on their wipe-boards** – pre-assessment: **children learnt this in KS1.** Explain that plants need lots of different things to be able to grow. Plants need: ▪ Water ▪ Nutrients from the soil ▪ Light ▪ Air ▪ Room to grow	SEND: Children to name the 5 things plants need in order to grow and draw an image to represent it. Main Activity: Children add flaps to their Interactive Skeleton Book. On the flap, children to draw an image of the 5 things plants need in order to grow. Under the flap, children to name and write a sentence about each one. WAGOLL Water and nutrients Plants need water to grow and keep healthy. Water helps the plants take in nutrients from the soil. If **you don't** give them enough water, they can wither and die. Sunlight Plants need sunlight to grow and keep healthy. The sun provides warmth and energy for plants to survive. Plants use **the sun's energy to makes their own** food energy in their leaves. If the plant does not get enough sun it can slow its growth and even kill it Air Plants need clean, fresh air. Dirty air caused by smoke, gases, and other pollutants can be harmful to plants.

Resources

A range of plants, including a dying plant.
Wipe-boards
Information about what plants need
Interactive Skeleton Books
Flaps for their books
Flower pots
Mature plant grown from a bulbs
soil/cotton balls
water
saucers
challenge questions

Activity 1:
Provide the children with information about what plants need. Children to share this with their partner.
Discuss what they have found out, and explore any misconceptions.

Children to name the things plants need in order to grow, and write a sentence to explain this in their Interactive Skeleton Book.

Activity 2:
Explain to the children that they are going to investigate to see if plants do need all of these things to grow.
Explain that they will be planting seeds in small groups and taking away one of the things plants need to see if they really need it!

In groups of 4, children to

1) decide on a question to investigate e.g. Will plants grow without water? Will plants grow without light? (1 group will set up and be responsible for one condition.)
2) plan out their investigation using the planning sheet to present this on. Children to also consider how they are going to record their findings.
3) set up their investigation.
4) predict what they think will happen.

Children to record their question, what they will use and their prediction in their journals. Children to also to record which variable they are going to change.

(Children to use mature plants that have grown from bulbs)

Plants use the air to make their own food.

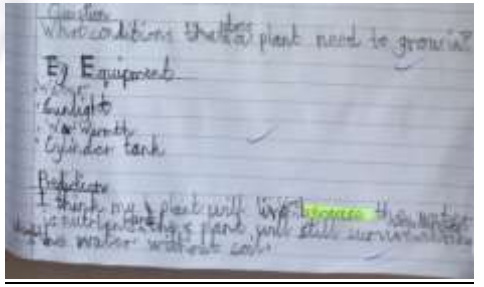
Room to grow

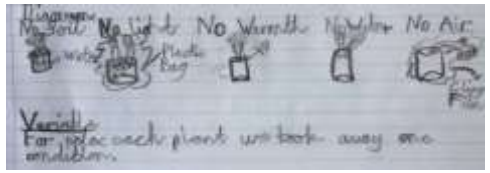
Plants also need enough room to grow. If seeds are planted too close together, they would all be fighting over the water, nutrients, air and light! Some of the plants would not survive.

Activity 2:
Write the question, equipment and prediction into journals.

SEND:
Use a template to present their learning on, and provide a word bank.

Main Activity:
Children to write their investigational question into their books, along with the equipment and their prediction.



		Children to also draw a diagram of what each plant will go without, and which variable they are going to change.  <u>Challenge:</u> Children to read and solve the following question. 

		Plenary Use the following BBC Bitesize website to consolidate what the children have found out today. Play the quiz at the end of the webpage. https://www.bbc.co.uk/bitesize/topics/zy66fg8/articles/zk43f82
Knowledge and Skills Objectives	**Activity**	**Differentiation**
Lesson Three: I can explore the requirements of plants for life and growth and how they vary from plant to plant.	**Prior Learning Task:** Watch the following video clip from Explorify. https://explorify.uk/en/activities/whats-going-on/growing-seed Ask: • What do the class think is happening – do they know that **they're** looking at a seed? • Can they describe what the seed looks like? • What do they notice about the soil – is it wet or dry? • Can the class see any similarities between these young plants and the plants they see around school? Ask the children if they can describe what they saw using only one word	Activity 1: Record findings from an investigation SEND: Children to pair up with someone from their group, to support them in creating a table of results.

Working Scientifically:

Hook: their plants from last week

Big Question:

Do all plants need the same amount of water? TTYP

Show the children a cactus. Discuss where cacti grow in the world. Explain that cacti are succulent plants. This means that they have thick tissues that take up and hold large amounts of water. The stored water keeps them alive during dry periods.

Introduction:

Explain to the children that all plants are different, just like all animals are. Some plants thrive in a particular habitat but not in another habitat.

Show images of habitats – pre-assessment; children learnt names of habitats in KS1.

Activity 1:

Give the children images of plants and a description. Children to match them to the habitat.

Discuss why that plant grows in that habitat.

Activity 2:

Ask:

Is soil important in the growing of plants? TTYP – pre-assessment; children learnt about this in previous topic.

Explain that soil provides a place for plants to grow. It holds the roots providing support for plants. It also stores nutrients, or food substances, needed for their growth. It also holds water for the plants.

Explain to the children that they are going to investigate how different soils might affect plant growth.

Ask the children to name the five types of soil. On wipe-boards, children to record the soil types – pre-assessment: children learnt this in previous topic.

Encourage children to articulate their thinking using correct scientific language.

Main Activity:

Children to use the data collected over the week, to create a table of results. Children to write a conclusion on what they have found out.

WAGOLL

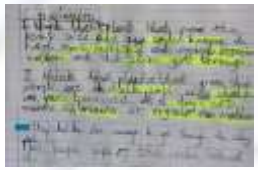
Conclusion

Following the investigation, it is evident that all the plants grew weaker if one of the conditions was removed.

I think sunlight is the most important condition as the plant with no sunlight lost it colour and started to droop. Light helps them to make food. If a plant has no or little energy, like all living things, it will die.

Resources

Plants from the previous lesson
Cacti
Results and notes taken during daily observations
Tables for results
Fact sheet about Plant Survivors
Soils (5 types)
5 plant pots

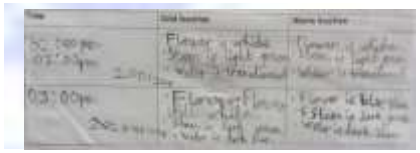
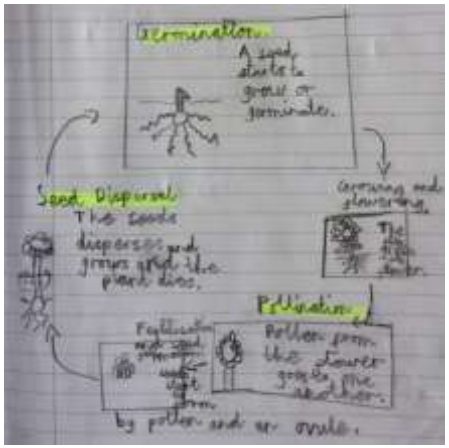
5 plants water	*Take feedback, and discuss the characteristics of each soil.* e.g. Chalky; gritty, dry, dusty Set up investigation with the children (5 plant pots, 5 different soils, 5 plants (same) and all get placed in the same place and given the same amount of water).    *This does not need to be written up as an investigation. The children already are in the process of writing up another investigation, and would make it writing heavy. If you want to record this investigation into journals, here is an example or create a whole class floor book page of evidence, building it up as you work through the investigation. <u>Activity 3:</u> Consolidate the investigation from last week. What were they investigating? How where they ensuring it was a comparative test? What are the variables? What is the control? Invite the children to look at their plants from last week, and complete their final day of observations. Children to share their observations with the rest of the class.	<u>Challenge:</u> Children to read this text from https://www.broadheath.coventry.sch.uk/year-3-autumn-2-reading-challenge-3/  Children to write a fact they have found out about plants on a template of a plant. Children to share these facts with the class. **Plenary**

	Model how to record their results, then children to record what they have found out in their journals in a table format. Activity 4: Invite each group to compare their plant with the control and with those of the other groups. Children to share their observations and explain their reasons for this choice. Children to conclude their findings. Assessment - Can the children explain the importance of sunlight within their conclusion?	Show an image of a cacti, snowdrop and a water lily. Ask the children to spot the Odd One Out. Children to discuss with their partner. Take feedback. Discuss how the needs of these plants vary. Cacti: These adapt to their habitat as they can survive with more sunlight, less water and by growing extra-long roots. These plants also are able to store water. Snowdrop: These adapt to their habitat by having less sunlight and liking the shade. Water Lily: These adapt to their habitat by having no or little soil and lots of water.
Knowledge and Skills Objectives	**Activity**	**Differentiation**
Lesson Four I can investigate the way in which water is transported within plants **Working Scientifically:**	**Prior Learning Task:** Give the children some images of plants; invite them to group them. **Some flowers are wild and some are garden flowers. If they don't identify that some are 'wild' and some are 'garden', lead them to this.** Assess whether the children know the difference between wild and garden, if they can identify which are which, and if they can name any of them.	Activity 1: Write up of investigation SEND:

Resources		
Wild & garden plants sorting activity ipads flowering plants (observing stems & leaves, as well as for the investigation) magnifying glasses digital microscope scissors vases/tall bottles water food colouring	**Hook: plants, soil bags, trowels,** **Big Question:** What are roots? What do they do? Why do plants have them? Explain that the roots of a plant have a number of different jobs. • They take up water and nutrients from the soil. • They keep the plant steady. • They keep the plant upright. • **They 'anchor' the plant** Introduction: Explain that we going to collect some weeds from our school grounds so we can look more closely at the roots of a plant. Explain that we are only going to collect weeds as they are unwanted plants – in KS1, children learnt about the difference between garden and wild plants. Explain that when we pull them up, we need to do it carefully so the roots are not damaged. When we are pulling them up, we want to be able to feel how strong the roots are at anchoring the plant into the ground. Take photographs of the children exploring roots and create a PicCollage of their exploration. Activity 1: **Consolidate that fact that roots, take up water and nutrients from the soil.** **Ask:** ***Therefore, how does water travel through a plant?* TTYP.** **Children to share ideas.**	Children to have a template to write on as well as a word back to support them. Children to be guided through the task. Main Activity: Children to write up their investigation and to record their ideas. WAGOLL I am going to investigation how water travels through a plant. I will use: (these can be drawn and labelled) • flowers • vases • food colouring • water Prediction: (children can draw a before and after image to support their written words) I predict the plant will suck up the water with the food colouring in, and it will turn the petals blue. **I don't think the stem will change** colour as it is already coloured. Challenge: What is photosynthesis? Use secondary sources to find out more.

	Explain the journey of water and why this journey is important. Introduce the term, photosynthesis. Use the following BBC Bitesize Website to explore how roots help to make food. https://www.bbc.co.uk/bitesize/topics/zy66fg8/articles/z6pvf82 **Following the video, the children could devise a way in which to remember this e.g. a mnemonic, a song/rhyme or through actions.** <u>Activity 2:</u> Take a stem, and consolidate that the stem is made up of thousands of tiny, thin tubes. These tubes are called xylem (pronounced zy-lem). Each tube runs from the roots to somewhere in the leaf, petal or fruit. These tubes are like straws, they suck up the water and nutrients. If you cut the stem of a flower, the xylem will suck up whatever they are sitting in. Therefore, you keep a cut flower hydrated and fairly healthy for a couple of weeks if you put the right nutrients into the water. Get the children to cut a stem and with a magnifying glass to explore it. What can they see? Using a digital microscope show the children a closer image of the inside of a stem. Invite the children to look at the leaves and identify the little tubes connecting it to the stem, and the tubes into the leaf (the children might identify that this is similar to our blood vessels. These carry blood, oxygen and energy around our body) <u>Activity 3:</u> Explain to the children that we are going to explore how, after a plant have been **cut, plants can continue to 'stay alive' for a little while longer.** Show the children some carnations, food colouring, water and vases, and ask them how we might use these resources to see the water within the plants and to demonstrate that the stem transports water to other parts of the plant. Children to discuss with their partner before discussing further as a whole class.	Present learning as a mind map. **Plenary** Explain to the children that they are going to grow a bean for home learning. Give each child: a seed paper towels tall plastic cup *children will need to add water at home. Model how to set the investigation up but provide an information sheet to take with them. 1) Take a tall plastic cup and wrap some paper towels into a cylinder and place inside. 2) Fill up the bottom quarter of the glass with water. 3) Place a bean between the paper towels and the inside of the glass. 4) Make sure the bean is above **the water and doesn't fall into** it.

	Model how to set up the investigation Children to write up the investigational question, draw what they will need, write a prediction (this can include before and after sketches) Children in groups to set up their own. This investigation will need at least 2-6 hours, so the children will return to it at the start of the following day.	5) Put it on a windowsill for a week or so. You should see the roots with their tiny hairs growing downwards and the shoot growing upwards. Children to take pictures or draw pictures of their bean every day. Children to create a bean diary (provide template for this)
Knowledge and Skills Objectives	**Activity**	**Differentiation**
Lesson five: I can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal Working Scientifically **Resources** Plastic bottles Pins Soil Dead leaves Food scraps,	**Prior Learning Task:** ***Why are bees important?*** **Children to discuss with their partner, and to summarise in one sentence, why they are important.** **Last term, the children learnt about apiculture in Geography. Within this unit of work, it was discovered that bees not only make honey, they help to pollinate the plants that make food we eat. Without bees we would not have all the plants/food we have** **Hook: flowers, kettle, vases, food colouring** **Big Question:** **Watch the following video on Explorify** **https://explorify.uk/en/activities/whats-going-on/water-colours** **Ask:** ***What were the changes before and after?***	Activity 2: Draw, label and annotate the life cycle of plants. SEND: Using a template, children to draw and label the plants life cycle using either a word bank or word cards. Children to match simple sentences to the correct stage. Stick onto their diagram. Main Activity: Children to draw a plants life cycle. Children to name and label the stages using a word bank. WAGOLL

Scissors Garden canes String Worms	***Why did the flowers change colours?*** ***Which parts of the plant are working?*** ***What does this tell us about the needs of a plant?*** **Consolidate the learning from last week.** **Introduction:** Show the children the carnation, water, vase and food dye again. Ask; Can you think about what might make the water be transported more or less quickly up the stem? Hopefully, the children will mention temperature. Explain to the children that we are going to investigate the effect of temperature. Children set up the investigation with support, and monitor it throughout the lesson. This activity can be recorded as a floor book page of evidence or as a PicCollage.  Activity 1: Explain to the children that all living things have a life cycle. Ask: *What is the life cycle of a human? TTYP* **Take feedback, and ensure all children understand what is meant by 'Life Cycle'.** Ask; *What the life cycle of a plant is?* In pairs, children to draw, label and annotate on a wipe-boards – pre-assessment; children did this in KS1 (they might not remember pollination) Give each group some information to research about the life cycle of a flowering plant.	 HA – can they add more about pollination? Challenge: Why are bees important?

	Children to discuss what they have found out. Consolidate pollination and the two different types of pollination; wind and pollinators. Wind – the wind can blow pollen from one plant to another. Pollinators – insects such as bees, butterflies and flies are attracted to the brightly coloured petals. They land on a flower to drink nectar. When they land, grains of pollen stick to them. Then, when they go to the next flower, the pollen is transferred. Use the information on BBCBitesize and the video to support the teaching of this. https://www.bbc.co.uk/bitesize/topics/zy66fg8/articles/zrrk4xs Following this, children could be flowers and bees, and the bees collect pollen from flowers and drop at other flowers. <u>Activity 2:</u> Model the drawing of a plants lifecycle. In their Interactive Skeleton Book, children to draw, label and annotate the life cycle of a flowering plant. <u>Activity 3:</u> Look at the investigation from the beginning of the lesson. Children to observe changes. Discuss with the children why these differences happened so quickly. Introduce the children to transpiration; the process by which water is pulled from the roots of the plant through the stems and leaves and released through microscopic holes in the leaves called stomata. The water is pulled up, against the force of gravity because of the interplay of two forces: cohesion and adhesion. On a hot day, plants need pull water from the roots quicker because at warmer temperatures water molecules move faster, and the rate of evaporation from stomata is faster too.	Plenary

	When we are hot, we drink more as we transpire more (sweat). We need to replace the water lost from our bodies. Add images and children comments to either their journal, floor book or used within a PicCollage for their journals.	
	Activity 3: Explain that plants make seeds following pollination. Give the children information about the Show the children different seeds. Ask the children to sort the seeds into those that might be carried by wind, animal The children were asked to carry out and present some initial research into how seeds are dispersed. After looking at a selection of seeds the children sorted pictures of different types of seeds and explained why they are suited to certain types of seed dispersal.	Display on the board, key scientific vocabulary for plants e.g. stem, flower, trunk. However, scramble them up. Invite the children to unscramble them. How many can they unscramble before the time runs out? Check, and consolidate the meaning of these words.