Imagine, Believe, Achieve

Springdale First School

Year 3/ Science / Plants

Children's prior learning in this area	Cultural Capital Opportunities	Key vocabulary and glossary
Year 1: identify and describe the basic structure of a variety of common flowering plants, including trees. **Year 2:** 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.	Opportunities to grow plants first-hand. Grow vegetables that can be eaten. Learn the importance of caring for plants to support their growth. Explore the importance of biodiversity and the interconnnectivity between plant and animal. Have a visit from a beekeeper to learn about the role bees play in pollination. 	pollination reproduction fertilisation seed formation seed dispersal function anchor transport absorb evaporate energy attract growth requirement air light/ sunlight water nutrients soil room carbon dioxide

Autumn term **Enquiry Question** What is the life-cycle of a flowering plant?	**Autumn term** **Enquiry Question** How do seeds get sown in nature?
Introduction session to unit	**Working Scientifically:** Gather and record results **Enquiry type:** Identify and classify
Activate prior learning: *Exporify: 'three weeds – odd one out' – elicit understanding and retrieval from Yr 2 – observe and describe how seeds and bulbs grow into mature plants.* **Children will know:** the names of the stages of the life-cycle of a flowering part with basic knowledge of each stage. (The stages will be explored in more detail throughout the year). Germination - The seed begins to grow. A sprout bursts through the seed coat. (Retrieval from Yr 2). Growing and flowering – Roots grow down and a shoot grows up. Then leaves will grow and a stem. Then, flowers will grow. (Retrieval from Yr 2). Pollination – the pollen is transferred from the male part of a flower to a female part of the flower so that the plant can reproduce. Fertilisation and seed formation – the pollen joins an ovule and a seed forms. Seed dispersal – the seeds are moved away from the parent plant. ***Have a life-cycle diagram with these stages in front of Big Book to refer to throughout year.***	**Children will know:** Life cycle stage: seed dispersal: plants make seeds that can grow into new plants, but if the seeds just fall to the ground under the parent plant, they might not get enough sun, water or nutrients from the soil. There wouldn't be room for all the plants to grow. Therefore plants disperse seeds so that the seeds have more chance to germinate and grow into healthy plants. **Children will know:** key methods of seed dispersal: wind, eating, carrying, bursting, dropping and rolling, shaking. **Children will know how to:** classify objects by sorting them according to their common characteristics. **Children will know how to:** gather and record their findings in an appropriate way, knowing that a table with headings is a clear way to organise categories of information. They will know how to draw a table with a header row and columns. (for deepen task). ***Practise:*** *Cloze procedure for why plants disperse seeds.* ***Apply:*** *Identify seeds in school grounds and the seeds' methods for dispersal.* ***Deepen:*** *How do you think these seeds get dispersed? Why do you think this? Classify a selection of seeds by predicted dispersal type.(Limit to two types). Justify why they have classified seeds in the ways they have by referring to common characteristics between the seeds and explaining how these characteristics enable that kind of dispersal.*

Ongoing throughout the life cycle of plant(s) **Enquiry Question** What is the life cycle of our Year 3 class plant like and how does that compare to the other Year 3 class's plant?	**Summer 1** **Enquiry Question** – What are the functions of the different parts of a plant?
Working Scientifically: Observe closely; take measurements; gather and record results **Enquiry type:** Observing over time	**Working Scientifically:** – gather and record findings
Retrieval from year 2: Life cycle stage: germination: seeds need water to germinate. They also need some warmth. Most seeds do not need light to germinate. In nature, some seeds germinate when they receive water and warmth in the Spring after the cold Winter. Many seeds need some warmth to germinate but seeds of tomatoes and peppers like extra heat to germinate. **Children will know:** when sowing seeds and bulbs, to read the planting and care instructions to know when and how to sow them as this varies from plant to plant. *Children to be involved in planting class plant. (Owls and Otters to plant different plants so the life cycles can be compared).* **Children will know how to:** make careful observations related to identifying plant structure and desriptive and scientific vocabulary and take measurements to the nearest cm (only to mm once taught in Maths). They will know how to select suitable methods for recording observations from a given selection. ***Practise:*** *Look at image of a plant and read three records of an observation with varying levels of success. Identify which is best and why.* ***Apply:*** *Over year, oberve the growth of plant and help to keep a descriptive and photographic class record of observations such as time from being sown to germination, height of plant over time, leaves/flowers appearing etc.* ***Deepen:*** *At the end of the year, review the records of observations for both class plants. How is the life cycle of these plants similar? How is the life cycle different?* 	**Retrieval from year 1:** identify the different parts of flowering plants: roots, stem/trunk, leaves and flowers (draw a diagram – observing closely of a photo/real plant) and label the parts for retrieval on post its) **Retrieval from year 2:** characteristics of living things (MRS GREN) **Children will know:** the different parts of the plant have different functions: The roots anchor the plant in the ground. They absorb water and nutrients from the soil. The stem or trunk holds the plant up. It also carries water and nutrients from the roots to the leaves. The leaves make food for the plant using sunlight and carbon dioxide from the air, providing the plant with energy. Flowers contain the parts needed for reproduction, such as pollen. They are brightly coloured to attract insects and birds. The insects carry pollen to other flowers. Flowers use the pollen to make seeds to grow new plants. **Children will know how to:** record findings in a labelled diagram. They will know that when labelling a diagram, the arrow points to the part of the diagram being identified, and the label goes at the other end of the arrow. ***Practise:*** *Describe the function of each part of a the plant by annotating the retrieval diagram under each post-it (it will become a flap to lift and read function underneath).* ***Apply:*** *What would happen to a plant if it didn't have roots? What would happen to a plant if it didn't have flowers? What would happen if it didn't have a stem? What would happen if it didn't have leaves?* ***Deepen:*** *Explain which characteristics of living things are observed in today's learning.* 

Summer 1 **Enquiry Question** – Are all roots the same?	**Summer 1** **Enquiry Question** – What do plants need to grow? (Part 1)
Working Scientifically: –observe closely; take measurements; gather and record results; interpret results **Enquiry type:** Pattern seeking	**Working Scientifically:** – ask questions; Plan, set up and perform an enquiry; observe closely; take measurements; **Enquiry types:** Observing over time and comparative and fair testing
Children will know: that botanists are scientists who study plants. (retrieval). Agnes Arber (born 1879) was the first woman botanist to become a Fellow of The Royal Society and third woman overall. She received a gold medal from The Linnean Society for her contributions to botanical science. (Look at some drawings and diagrams from her work to show how botanists record their observations). **(Retrieval KS1) Children will know how to:** observe closely using a magnifying glass. First, hold the magnifying glass close to your eye. Then move slowly towards the object until it is in focus. **Children will know how to:** take measurements to the nearest cm (or cm and mm if taught in Maths at this point) **Children will know how to:** record observations with careful observational sketching. They will know to annotate their drawings with descriptive observations of appearance, texture and thickness and measurements of length. ***Practise:*** *practise the skill of using a magnifying glass and taking measurements of length.* ***Apply:*** *Be a 'botanist', observing roots of different plants, observing closely with a magnifying glass, measuring and recording with annotated observational sketches. Could work as a table group – each child observing all roots on the table but each child taking responsibility for sketching one plant's roots for the group.* **Children will know how to:** interpret results of a pattern-seeking enquiry by comparing each specimen/sketch and looking for patterns (similarities) across them all and identifying differences too. Once differences have been observed, e.g. in length and thickness (could also look at photos), children could consider some reasons for why roots are different, looking for patterns in the size of the root compared to the size of the plant. ***Deepen:*** *After guided discussion of how to seek for patterns, write an answer to the enquiry question, justifying answer with similarities and differences and extending by making connection between size of root and size of plant).*	Retrieval: Refer to big book life cycle and recall stages. Explain this lesson's focus is on the 'growing and flowering' stage. **Children will know how to:** (With some support and modelling,)identify a question to test, plan and carry out a simple practical enquiry relevant to – What do plants need to grow? **Children will know how to:** record observations with descriptive written observations of appearance of plant and photographs. Identify some variables that need to be kept the same. Recognise when a test isn't fair and suggest improvements. Through scaffolded discussion, choose an appropriate line of enquiry. Set up an experiment using a maturing flowering plant to investigate factors for growth. Assessment opportunity: Record results by making systematic and careful observations and taking measurements. Each group to feedback to class their results. Model following success criteria to write a class conclusion in big book about what plants need to grow. ***Practise:*** *practise the skill of identifying variables to keep the same and recognising when a test wouldn't be fair in a different context. (Paired/group – whiteboards)* ***Apply:*** *Each group to choose a variable they want to test, e.g. water, light, air, room, temperature, soil. As a group, record the variables they will keep the same and discuss and record a simple method for performing enquiry. Set up enquiry. Periodically over several days, gather and record careful observations of plant.* 

Summer 1 **Enquiry Question** – What do plants need to grow? (Part 2)	**Summer 1** **Enquiry Question –** Do all plants require the same things to grow?
Working Scientifically: – interpret results; evaluate an enquiry; present findings; draw conclusions **Enquiry types:** Observing over time and comparative and fair testing	**Working Scientifically:** - present and report findings **Enquiry type** Research using secondary sources
Children will know how to: interpret results by using their straightforward, scientific evidence from their enquiry to answer their group's question. **Children will know how to:** evaluate their enquiry by reflecting on whether: it answered the question; whether there were flaws that meant that the test wasn't fair; suggesting improvements **Children will know how to:** present and report their group's findings to the class as a group using simple scientific language. They will know that when presenting findings they should consider the purpose and audience. They will make suggestions about how best to present findings. **Children will know how to:** draw conclusions (about what a plant needs to grow) by looking at the results (all group's results – collated by teacher during presenting of findings). Following children's presentations, **children will know:** plants need air, light, water, nutrients from soil, and room to grow (and suitable temperature or any other variables if tested). ***Practise:*** *practise the skill of interpreting results and evaluating an enquiry using example data and enquiry in a different context. (Paired/group – whiteboards)* ***Apply:*** *As a group, interpret group's results and evaluate enquiry.* ***Practise:*** *evaluate teacher's example of presenting findings – what was successful?* ***Apply:*** *As a group, rehearse then present findings to class.* ***Deepen:*** *Draw conclusions about what a plant needs to grow, commenting on results from all groups in the class.*	**Children will know:** the requirements for life and growth will vary from plant to plant and be able to describe how one plant's requirements are different to the plant investigated last lesson. They will know that plants are adapted to their habitat due what the habitat provides. **Children will know how to:** research using secondary sources by identifying the relevant information they will need to search for and to take notes. **Children will know how to:** present and report their group's findings to the class as a group using simple scientific language. They will know that when presenting findings they should consider the purpose and audience. They will make suggestions about how best to present findings. ***Practise:*** *practise the skill of research using secondary sources by researching a plant using I do/We do.* ***Apply:*** *As a small group, research the requirements of life and growth for a particular plant.* ***Deepen:*** *Present findings in an appropriate way – e.g. poster/PPT etc to show to class – stick copy in Big Book as a recall method.* 

Summer 1 **Enquiry Question** – How does water get transported in plants?	**Summer 1** **Enquiry Question** – Do you think flowering plants would always change colour in the same length of time?
Working Scientifically: –observe closely; make a prediction; present and report findings **Enquiry type: observing over time**	**Working Scientifically:** – ask questions; make a prediction; plan, set up and perform an enquiry; **Enquiry type –** comparative and fair testing
Retrieval: Children will know: the stem or trunk holds the plant up. It also carries water and nutrients from the roots to the leaves. This helps the plant in the growing and flowering stage. **Children will know:** The process of water transportation is the way water moves through a plant. The roots absorb water and nutrients from the soil. The stem contains tubes that transport water to the leaves. Water evaporates from the leaves which causes more water to be sucked up the stem. The water is sucked up the stem like water being sucked up through a straw. Recall that the leaves use sunlight and carbon dioxide to make food. This food gets dissolved in the water and moves along different tubes to growing parts of the plant, including the flower, where seeds are developed. **Children will know how to:** present findings by considering the purpose. They will know diagrams can help people understand a process rather than text alone. They will know to use arrows on a diagram to represent movement (of water). **Children will know how to:** make a prediction by referring to knowledge they already have. ***Practise:*** *Match the words transport, absorb, evaporate and dissolve with definitions.* ***Apply:*** *Draw arrows on a pre-drawn diagram to represent the transportation of water through a plant. Explain the process by annotating the diagram using key word mat/stem sentences for support.* ***Deepen:*** *What will happen when we put a flower in blue coloured water? Write a prediction, referring to scientific knowledge.* *Set up investigation of flower in blue water. Take photos and teacher to scribe what happened in Big Book.*	**Children will know:** that scientists are inquisitive and when they find an answer to an enquiry this can prompt them to think up other questions they want answering. **Children will know:** to think of further, related questions, to consider the variables that would affect the time taken for water to go from root to flower. **Children will know how to:** make a prediction by referring to knowledge they already have. As a class, pick one of the variables to test and carry out whole class enquiry. Discuss conclusions and teacher to write up in Big Book. ***Practise:*** *Turn teacher's wondering, e.g. 'I wonder if the temperature of the water affects the time taken for the flower to change colour' into a testable question.* ***Apply:*** *List own wonderings and turn into testable questions. Discuss as a class how you might carry out some of these enquiries (not written).* ***Deepen:*** *Following class discussions and modelling, children write a prediction for a question, referring to own knowledge/observations.*

Summer 2 **Enquiry Question** – How do flowers reproduce?	**Summer 2** **Enquiry Question** – How do the life cycles of Owls/ and Otters' plants compare?
Working Scientifically: – observe closely	**Working Scientifically:** – interpret results – answer the question
Retrieval: Refer to big book life cycle and recall stages. Recap the function of the flower and explain we will look at this in more detail as we deepen our understanding of the pollination and fertilisation stage. **Children will know:** A flower is a plant's reproductive organ. Plants produce seeds in order to reproduce. To make a seed, a flower must be pollinated. Pollination: Pollen is made by the male part of the plant. – the anther. For many flowering plants, the pollen must travel from one plant to another plant of the same species. The pollen must reach the sticky stigma, the female part. *(The specific vocabulary – anther, stigma do not need to be remembered in Year 3 although some children may be able to remember these terms. Anther and stigma are not visible on some flowering plants).* Some flowering plants pollinate each other due to wind blowing the pollen but many are pollinated by insects. The function of the petals is to attract insects with their bright colours. The insects collect sweet nectar to feed on for energy and honeybees use it to make honey as a food supply over the Winter. Some insects can eat pollen too. Pollen is a good protein source for bees and some bees collect it for the larvae (their young). Pollen sticks onto the insect's body or legs and when they visit another flower it will brush off onto the female part of that flower. Fertilisation is when the pollen joins an ovule in the ovary. This is when a seed starts to form. **(Retrieval) Children will know how to:** observe closely using a magnifying glass ***Practise:*** *Matching information/true or false statements.* ***Apply:*** *Nature Walk – observe closely plants in the school grounds – can the children identify petals, stigma, anther and ovary on plants not observed in class (new context) – sketch and annotate with sticky knowledge.* ***Deepen:*** *How would grey petals affect the pollination process of a plant? What effect would this have on reproduction?*	***Deepen:*** *At the end of the year, review the records of observations for both class plants. How is the life cycle of these plants similar? How is the life cycle different?*