


**Spaced retrieval opportunities throughout each week (away from Science lesson):** Spark Quiz with questions added weekly- progressively move away from multiple choice and on to 'simple' questions, KO partner quiz, KO covered on IWB children use own WB's, answer enquiry questions from previous lesson/week, matching pairs cards, LBQ selected questions on IWB.

**Activities for each lesson:** see plan below

|   |  |     |              |        |
|---|--|-----|--------------|--------|
|  | <b>Year</b>  | 3/4 | <b>Topic</b> | Plants |
|   | <ul style="list-style-type: none"> <li>Identify and describe the functions of different parts of flowering plants: roots; stem/trunk; leaves; and flowers.</li> <li>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.</li> <li>Investigate the way in which water is transported within plants.</li> <li>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</li> </ul> |     |              |        |

| Prior learning   | Future learning   |
|--|---|
| <ul style="list-style-type: none"> <li>Observe and describe how seeds and bulbs grow into mature plants. (Y2 - Plants)</li> <li>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. (Y2 - Plants)</li> </ul> | <ul style="list-style-type: none"> <li>Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats)</li> <li>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)</li> </ul> |

**WHAT PUPILS NEED TO KNOW OR DO TO BE SECURE**

**Show understanding of a concept using scientific vocabulary correctly**

**Key learning**

Many plants, but not all, have roots, stems/trunks, leaves and flowers/blossom. The roots absorb water and nutrients from the soil and anchor the plant in place. The stem transports water and nutrients/minerals around the plant and holds the leaves and flowers up in the air to enhance photosynthesis, pollination and seed dispersal. The leaves use sunlight and water to produce the plant's food. Some plants produce flowers which enable the plant to reproduce. Pollen, which is produced by the male part of the flower, is transferred to the female part of other flowers (pollination). This forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways. Different plants require different conditions for germination and growth.

**Possible evidence**

- Can explain the function of the parts of a flowering plant
- Can describe the life cycle of flowering plants, including pollination, seed formation, seed dispersal, and germination
- Can give different methods of pollination and seed dispersal, including examples

**Key vocabulary**

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

### 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.

**Apply knowledge in familiar related contexts, including a range of enquiries**

| Session | Question                                   | Activities  | Possible working scientifically outcomes  | Questioning/<br>Hypothesis | Observing &<br>Measuring | Practical<br>Enquiry | Recording &<br>Presenting | Concluding | Evaluating |
|---------|--|---|---|----------------------------|--------------------------|----------------------|---------------------------|------------|------------|
| 1       | What do the different parts of a plant do? | <p><b>Introduce new KO.</b><br/> <b>Spaced retrieval PP (Mon/Tues): Key knowledge from year 2 (using y2 KO).</b></p> <p>Place pictures of plants, seeds, trees, flowers etc on the desks. These could be real plants, pictures of a mixture.</p> <p>Q: What do you know already? Do you recognise any of these plants? Do you know that the different parts of the plants are called?<br/>           Discuss prior knowledge and misconceptions.</p> <p>Share image of basic plant without labels. Can chn identify these parts? flower, leaves, stem, roots</p> <p>Q: What jobs do they do? Discuss prior knowledge and expand/address misconceptions.<br/>           (use images or real plants to show these parts as discussing them)</p> | <p>Label a plant explaining the function of the different parts of the plant.</p> <p>Support group – could use iPads and pictures of actual parts of plants to verbalise what each part does.</p> | ✓                          |                          |                      |                           |            |            |

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|   |  | <p>Roots – anchor and absorb water and nutrients from soil<br/> Stem/trunk – holds plant up, carries water/nutrients from roots to leaves<br/> Leaves – make food using sunlight, carbon dioxide (photosynthesis mentioned in animals, including humans unit – ensure chn understand process BBC video clip)<br/> Flowers/blossom – enhance photosynthesis, pollination and seed dispersal<br/> 10 mins: chopped up parts of a flower vocabulary - pairing game from KO.</p> <p><i>Discuss exceptions to the rules – not all plants have roots – bryophytes have no roots, leaves or stems. Moss and liverworts belong to this group. They are flowerless plants that grow in clumps.</i></p> <p>Spaced retrieval PP: Annotate flower from KO explaining parts. Ask them enquiry question.</p> |   |   |   |   |   |   |   |
| 2 | <p>What do plants need to live and grow?<br/> Why do they need these things?</p> | <p>Spaced retrieval: Blank out bits of KO (on publisher). Annotate flower from KO explaining parts.<br/> Starter – pairs game<br/> Match the picture of plant parts with the function cards to recap learning from previous lesson.</p> <p>Reminder: What plants need to live: 7 processes that tell us if something is alive (movement, respiration, growth, reproduction, excretion, nutrition and sensitivity) Plants do all these 7 things.</p> <p>Q: What do you think plants need to grow well?<br/> Q: How can we find out?</p> <p>Investigation – see what happened to plants in different conditions.</p>   | <p>Chn choose a question to investigate such as:<br/> What happens if a plant has no water?<br/> Can a plant grow in the dark?<br/> If a plant has no nutrients, will it still grow?</p> <p>Model the investigative stages:<br/> Prediction, Method, Set up, Results, evaluation, conclusion</p> <p>SEN – carry out investigation.<br/> *This investigation will run over a few weeks as chn observe their plants grow. Time is to be made to evaluate their results and discuss in future lessons*</p> | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

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|     |   | Spaced retrieval: List what they need- focus on why. Explain to a partner what they need and why and record on list sheet   |   |   |   |  |  |   |   |
| 3   | Does temperature affect how fast water moves through a plant? | <p>Spaced retrieval: Blank out bits of KO (on publisher). Give picture- name parts, what do plants need to grow and why?</p> <p>Share images or actual roots/stems from plants. Discuss the purpose of these parts of the plant. <a href="https://youtu.be/Rz7zmSlvrtA">https://youtu.be/Rz7zmSlvrtA</a></p> <p>Water transportation – the way water moves through a plant.<br/> Roses absorb water from soil.<br/> Stem transports water to the leaves.<br/> Water evaporates from the leaves. (ensure understanding of vocab)<br/> Evaporation causes more water to be sucked up the stem.<br/> Water is sucked up the stem like water being sucked through a straw.</p> <p>Ask chn to verbalise this in talk partners.</p> <p>Share colour transportation example – white flower or celery in food colouring (This could perhaps be discussed and set up at end of previous lesson so results ready for this lesson). Make a verbal prediction as to what they think happened based on the temperature? Write it in their books. Discuss how the stem sucked up the coloured water, then transported the water to the flower or up the celery stick.</p> <p>Spaced retrieval: Water drop- picture of a plant and a water drop. Explain the process in their own words.</p> | <p>Comparative Investigation</p> <p>Discuss how to make careful observations.</p> <p>Work with the children to make a conclusion based on their observations. Model writing a conclusion of results based on STEM questions i.e The hotter the environment the more water is transported.</p> <p>Evaluate the results found and discuss what could they have done differently to help get better results.</p> <p>Question: If you could add to this experiment what would you do?<br/> Verbal feedback as a plenary.</p> <p>SEN verbal discussion to explain their understanding use arrows on picture to show the process.</p> | ✓ | ✓ |  |  | ✓ | ✓ |
| AoS |   |   |   |   |   |  |  |   |   |

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| 4 | How do plants reproduce? | <p><b>Spaced retrieval: Blank out bits of KO (on publisher). On the board, two children with different views- finish sentence and prove one wrong (water transportation)</b></p> <p>What scientific vocab should we be using – photosynthesis etc</p> <p>Q: What is a flower? Flowers job is to create seeds so that new plants can be grown. The flower is made up of lots of parts that work together to make seeds. Share image of labelled flower and parts.</p> <p>Explain that each part of the flower has a special job to do to make the seeds.</p> <p><u>Pollination and Fertilisation</u></p> <p>This occurs when pollen from the anther is transferred to the stigma.</p> <p>Discuss importance of bees, butterflies in this process.<br/>*Opportunities could be taken to go outside and observe bees, butterflies in this process around the school grounds*</p> <p>Pollen on stigma travels down the style – refer to images and actual plants whilst discussing.<br/>Once reaches ovary, pollen joins ovule and grows into a seed. This is fertilisation.</p> <p>Share images or actual plants to show how plants do this differently. <a href="https://www.twinkl.co.uk/resources/ks2/science/ks2-parts-of-a-flower-hotspots">KS2 Parts of a Flower Hotspots (twinkl.co.uk)</a><br/>Pea seeds – peapod, poppy seeds in enlarged ovary, sunflower seeds etc</p> <p><b>Spaced retrieval: Give the statements chopped up and children put them in order.</b></p> | <p>Chn to order the pollination/fertilisation process using a word bank.</p> <p>SEN – pictures and phrases. Children can use diagrams to order the process and challenge to write a simple sentence to show understanding.</p> | ✓ | ✓ |  |  |  |  |
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AoL

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| 5   | How do new plants grow?           | <p><b>Spaced retrieval: Blank out bits of KO (on publisher). Ask previous week enquiry question: How do plants reproduce?</b></p> <p>What do we know about lifecycles already? Discuss. Chn can refer to previous investigations and observing the plant grow. (Use ipads and scan QR code to use secondary sources – remind child of computer lesson on researching safely) Can they talk through the life cycle process as a class. Children to explain it back from the information they have read.</p> <p>CT to work with SEN children to sequence whilst others are researching.</p> <p>using PPT, ensure that the children offer more detail and use the vocabulary they have developed over the weeks. Seed, Germination, Growing, pollination and fertilisation and seed dispersal.</p> <p>Look at the features of seeds to decide on their method of dispersal.</p> <p><b>Answer enquiry question: LBQ (link on PowerPoint) Question 1 and 2- focusing on life cycle.</b></p> | <p>Using secondary sources, the Chn will create a diagram of the life cycle detailing the 5 main stages of a plants life cycle.</p> <p>SEN – sequencing picture cards to talk through the process and to name.</p>                               | ✓ |   |   |   |   |  |  |
| AoL |                                   |  |  |   |   |   |   |   |  |  |
| 6   | How do plants grow in new places? | <p><b>Spaced Retrieval: Blank out bits of KO (on publisher). Revisit previous week's enquiry question: How do new plants grow?</b></p> <p><a href="https://www.bbc.co.uk/bitesize/clips/znvfb9q">https://www.bbc.co.uk/bitesize/clips/znvfb9q</a></p> <p>Seed dispersal – discuss the different ways seeds can be dispersed. <b>*opportunity to go outside and identify plants that use different methods* Grove</b></p> <p>Wind/dropping/eating</p> <p><b>Spaced Retrieval: Seed dispersal image– focus on three: wind, dropping off a tree and poo. What do you know?</b></p>  | <p>Children to use list to identify and sort into the correct category of dispersal.</p> <p>Provide a sheet with table of dispersal and some pictures of plants to identify to support the LA. Words given to SEN to discuss and sort items.</p> |   | ✓ | ✓ | ✓ | ✓ |  |  |