



Plants (Biology)

Year 3

End Points:

- Flowering plants all have roots, a stem or trunk, leaves and flowers, but do not all look the same
- A botanist is a scientist who studies plants
- Plants need air, light, water, nutrients from soil and room to grow
- Plants need differing amounts of things in order to thrive
- Water moves from the roots of a plant upwards via the stem
- Plants absorb water from the soil to help them live and grow
- Plants with larger root systems can take more water from the soil
- Pollination is needed for flowering plants to reproduce
- Flowering plants can only produce seeds if pollen is transferred from the anther to the stigma
- Insects are essential for pollination
- Plants spread their seeds in different ways (wind, animals, gravity)

This unit builds on directly from Year 2 Plants where pupils learned how to observe and describe seeds and bulbs, found out what plants need to grow and also learned how plants are grown by farmers as crops for people to eat. In this unit, pupils will look more closely at flowering plants, their features and the functions of their features. They will look at specific species including hydrangea and cacti and there is scope for including flowering plants that grow in the local area if relevant. Pupils will learn that the scientific study of plants is called botany and that what we understand about plants comes from contributions from many botanists over the years (disciplinary knowledge). In the first lesson, children will learn about Joseph Banks, the famous botanist who gathered over 30,000 plant specimens on his travels around the world with Captain Cook (pupils will learn about Captain Cook in Year 5 Geography when they Study Australia and New Zealand) and Agnes Arber, who was one of the first women to be recognised for her contribution to botany.

The reason we have started this unit with looking at botanists, is to show children real scientists study plants, they look closely at plant specimens, draw and annotate pictures and diagrams, go into the world to look for plants and vitally ask questions about how plants behave, for example how they reproduce. Therefore, when pupils go on to do some of these things in the subsequent lessons within this unit, they will understand that these tasks require scientific thinking, questioning, exploring and analysing.

As pupils work through this unit they will continue to build an understanding of the diversity of life on Earth. This conceptual understanding is a thread woven throughout the units on plants in KS1 and KS2. In this unit, pupils will learn that although plants all need light and water to thrive, they need it in differing amounts. They will recognise that plants grow in diverse environments around the world and even within a garden, there are some plants better suited to particular places than others. Pupils will go on to focus on how plants transport water from their roots to the rest of the plant. They will see how celery does this by investigating what happens when we place a stick of celery in brightly coloured inky water. This builds on their understanding of what a plant needs from Year 2.

This unit also covers pollination and seed dispersal, two vital parts of the life cycle of a plant. There is an emphasis on interconnection in these lessons, pupils learn how animals such as bees are vital for the pollination process and also, in some instances, for seed dispersal. When learning about pollination, there is an opportunity to show pupils pollen within a flower, however you must consider implications of using real flowers and pollen if pupils have allergies. Care must also be taken to prevent children touching pollen with bare hands, or getting pollen near their eyes, nose or mouth. Pupils will learn that germination is the process where a seed begins to grow into a plant, building on knowledge from Year 1 and 2.

Included in this unit is an additional lesson on the American botanist George Washington Carver. Understanding Carver's work will build on knowledge of food and farming from Year 2 and will show children how the work of scientists can influence how people work, what they grow and how they feed their families. Carver was born into slavery; understanding the implications of this for his life will provide some prior knowledge for children when they study the Slave Trade in Year 5.

This unit plays a crucial role in helping pupils to understand substantive science knowledge, how plants grow, what they need to thrive, how they reproduce, but also disciplinary knowledge of how scientists construct knowledge within their fields.

Lesson Sequencing:

In lesson one, children will learn about the different parts of flowering plants and their respective functions. Children will also learn that a botanist is a scientist who studies plants. Lesson two will explore what plants need to thrive, contrasting different plants and the differing amounts of things they need to live. In lesson three, children will learn how water is absorbed and transported in a plant. Lessons four and five will explore reproduction in plants, looking at pollination and seed dispersal respectively. In the assessment lesson, children will apply the knowledge learnt to answer the question: how do flowering plants reproduce?

Misconceptions:

- Flowers are decorative rather than a vital part of reproduction
- Plants eat food
- 'Food' comes only from the soil via the roots

- Plants only need light to keep them warm
- Roots suck in water which is then sucked up by the stem

Working Scientifically criteria met in this unit:

- asking relevant questions and using different types of scientific enquiries to answer them
- setting up simple practical enquiries, comparative and fair tests
- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- identifying differences, similarities or changes related to simple scientific ideas and processes
- using straightforward scientific evidence to answer questions or to support their findings.