YEAR 3 UNIT 4: How Does Your Garden Grow? (Plants)

Enquiry Question: What are the functions of the different parts of a plant?

Related units: Year 2: Unit 5: Young Gardeners (Plants) – How do plants grow?
Year 5 unit 3: Circle of Life! – How do life cycles vary?

Unit overview

National Curriculum Link Year 3: Plants
Pupils will identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. They will 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. They will investigate the way in which water is transported within plants. They will explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. This builds on what children know about the basic structure of a plant (Year 1) and that plants need water, light and a suitable temperature to grow and stay healthy (Year 2); and how seeds and bulbs can grow into mature plants (Year 2). Pupils will be introduced to the relationship between structure and function: the idea that every part has a job to do, that plants can make their own food, but they do not need to understand how this happens.

Scientific vocabulary

- Root
- Stem
- Veins
- Germinate
- Pollen
- Pollination
- Ovary
- Sepals
- Stamen
- Carpet
- Stigma
- Style
- Ovule
- Petal

Working scientifically

- Comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser
- discovering how seeds are formed by observing the different stages of plant life cycles over a period of time
- looking for patterns in the structure of fruits that relate to how the seeds are dispersed
- observe how water is transported in plants, for example, by putting cut, white carnations into coloured water
- observing how water travels up the stem to the flowers.

Assessment

1. Name the different parts of a plant and their functions
2. Explain how water is transported in plants
3. List what plants need to grow and stay healthy
4. Explain different ways that plants spread their seeds

Cross-curricular links

Writing:

- Plan and write up an investigation
- Write an explanation about how water is transported within plants

Teacher knowledge

The main parts of a flowering plant are:

- the roots
- the stem
- the leaves
- the flower.

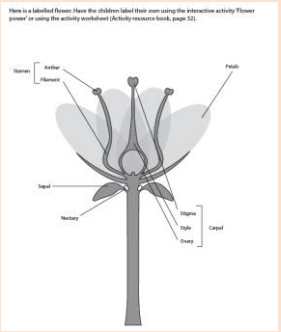
The roots of a plant anchor it into the soil. They absorb water and any dissolved nutrients. These are then transported to the rest of the plant via bundles of tubes inside the stem called vascular bundles. The stem is the main support structure of the plant, allowing it to stay upright and providing a frame for the leaves. **In many plants the stem** is also a place where nutrients can be stored. **The leaves are** where the plant makes its food.

They take in carbon dioxide from the air and water from rain, converting them into oxygen and a sugar called glucose. Leaves also get energy from the sun, capturing it using a green chemical known as chlorophyll. This whole process is called photosynthesis.

Another important process is transpiration. This is when water evaporates from a plant's leaves, which sucks up water from the roots. **Flowers are the reproductive organs of the plant**. They produce pollen and eggs, which then produce seeds.

For plants to grow healthy they need a number of things, such as: water light air sufficient space a supply of minerals and other nutrients. Plants don't need soil to grow, as long as they get a suitable supply of minerals and nutrients. In fact, in many modern commercial greenhouses plants are grown in a nutrient-rich liquid instead of soil. This growing technique is called hydroponics. It's important to be aware that there's a difference between what seeds need to germinate and what plants need to grow. Seeds just need warmth and water to germinate – they do not need light. They initially grow using the food stores within the seed. If they don't get any light before these stores are used up, then they can die.

Plants reproduce sexually. Most flowers have both male and female parts. The male parts produce the pollen and the female parts produce the ova (eggs). Both the pollen and eggs contain half the genetic information necessary to make a new plant, in the same way that sperm and eggs do in animals. Plants can't pollinate their own flowers – instead, they need to get their pollen to the flowers of another plant. Often this is carried by insects, but plants can also disperse their pollen into the wind. When pollen lands on the stigma of another flower, it joins with the egg and their DNA combines. The egg is now fertilized. This will happen many times with all the eggs in the ovary. Each egg develops into a seed and, as this happens, the flower will change and lose its petals. The ovary swells up and turns into a structure known as a fruit. In some plants the fruit is attractive to animals who then eat it, carrying the seeds inside their body until they go to the toilet elsewhere where the seeds can then grow. Other seeds are dispersed on the wind, via water or other methods. Remember: Stamen = "men" = male. Stigma = "mama" = female



Misconceptions:

- Plants get their food through their roots. In fact, they take in water and some minerals through the roots, but make their food in their leaves.
- Plants get their food through the soil. In fact, plants make their own food, but the roots help them get water, minerals and nutrients that help them grow.
- Seeds need light to germinate. This is not true. They just need water and warmth. There is enough food stored inside the seed to provide the energy it needs to produce a shoot and roots.

Resources

www.schooltube.com/video/8b5cd92efbe9708a4a5a
Plants for kids activities: www.sciencekids.co.nz/plants.html
A handy IWB resource for teaching about seeds: www2.bgf.org/bgf2/custom/resources_ftp/ client_ftp/ks2/science/plants_pt2
Pollen Park: www.hyperstafs.info/work/biology/Handford/artifact/start