

UNDERSTAND, DESCRIBE AND EXPLAIN: PARTS AND FUNCTIONS

To understand 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

To understand the functions of different parts of flowering plants

To understand the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal

Learning links:
Geography:
Y5: Rainforest/Biomes
Absorbing CO2/
Photosynthesis/
Plant reproduction

Learning links:
Gardening:
Y3-6: Flowering plants and their growth

Learning links:
Computing :
Y3-6: time lapse

<i>Plants</i>		<i>Flowering</i>		<i>Non-flowering</i>		<i>Water</i>		<i>Nutrients</i>		<i>Soil</i>	
<i>Photosynthesis</i>		<i>Chlorophyll</i>		<i>Absorb</i>		<i>Heat</i>		<i>Energy</i>		<i>Sun</i>	
<i>Root</i>		<i>Stem</i>		<i>Leaves</i>		<i>Flower</i>		<i>Reproductive organ</i>		<i>Fertilisation</i>	
<i>Sepal</i>	<i>Petal</i>	<i>Stamen</i>	<i>Filament</i>	<i>Anther</i>	<i>Pistil</i>	<i>Stigma</i>	<i>Style</i>	<i>Ovary</i>	<i>Carpal</i>		
<i>Pollen</i>		<i>Ovary</i>		<i>Ovule</i>		<i>Seed</i>		<i>Pollination</i>		<i>Seed Formation</i>	
<i>Seed Dispersal</i>		<i>By wind</i>		<i>By animal (internal)</i>		<i>By animal (external)</i>		<i>By explosive action/self-propelled</i>			

Requirements of life:

A plant must have the following things if it is to successfully grow in to an adult plant:

Warmth and light:

A seed will **not produce** a plant at all if it is kept **too cold**. The seed needs **warmth to germinate** and start to grow into a healthy plant.

Light is used as **energy** for making food, a process called **photosynthesis**.

Air:

Plants take in **carbon dioxide** from the air for **making food (photosynthesis)**.

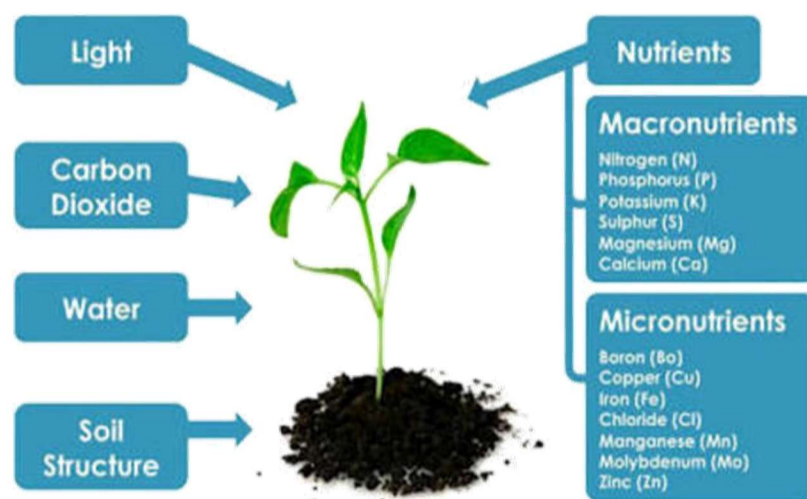
Water and nutrients:

Like humans and animals, plants need both **water and nutrients** (food) to survive. Plants use **water** to carry **moisture and nutrients** back and forth between the **roots and leaves**.

Room to grow:

Both the **roots and foliage** (leaves) need **room to grow**. Without enough room, plants can become **stunted or too small**.

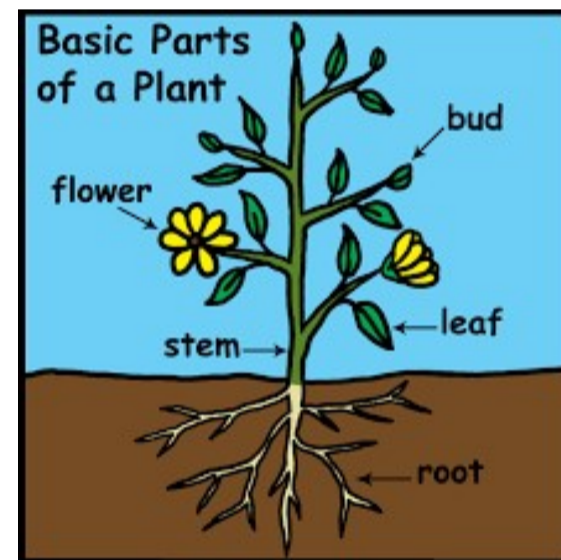
In order to obtain these requirements, plants have certain parts which have different functions.



THINKING POINT:



What do you think will happen if a plant was placed in a dark room or the soil was removed or it wasn't watered?



The parts of flowering plants and their functions:

The Roots: *suck the water and nutrients* up out of the **soil** and into the plant.

The Stem: *holds up other structures* such as the leaves and flowers.

Stems also *carry water* and *minerals* up *from the roots* to the leaves and *take food back down* to be stored and distributed to the plant.

The Leaves: The **leaves** of a tree (or plant) are where **photosynthesis** happens.

The **leaves soak up/absorb heat** and **energy** from the sun and carbon dioxide from the air to **make food** (photosynthesis).

Absorbing energy from the **Sun**, **water** from the **ground**, and **carbon dioxide** from the **air**, they make **glucose** (sugar) to feed on so they can **grow into strong, healthy plants**.

The Flower:

Flowers are the **reproductive organs** of the **flowering plant**.

They are bright, colourful and full of sweet nectar to attract insects, which may be carrying pollen, to their plant.

The flower contains all of the parts needed to pollinate and reproduce.

THINKING POINT:



What would happen if a plant did not have any leaves/roots/a stem/flowers?

EXPLORE AND INVESTIGATE:

HYPOTHESE
ENQUIRE
TEST
RECORD
REPORT
CONCLUDE

Flowering Plant Dissection:

Dissect different flowering plants into their main parts and explore the function of these. Stick them on a sheet and discuss similarities/differences.

How will plant growth differ in different conditions?

Ensuring the same type of plant, soil, amount of water and location of planting, add different liquids being given to each plant to observe any differences in plant growth: height, colour, appearance of health etc.

Each day provide each plant with the same amount of liquid but of the following ingredients instead of water:

Water (Control)	Vinegar (Acid rain)	Aspirin solution	Orange juice	Miracle Grow Solution
------------------------	----------------------------	-------------------------	---------------------	------------------------------

Observe and measure the growth of the plants – is there any observable difference between them and the control?

Instead of changing the type of feed given to the plants, children could change different variables (soil type/plant location) and observe how this impacts on plant growth. Report and conclude findings.

KEY ASSESSMENT AND APPLICATION OPPORTUNITIES:

EXS: 1. Explain what a flowering plant needs to survive and how its different parts help it to achieve this.	GDS: 1. Could a plant survive without a _____? Why not?
--	---

UNDERSTAND, DESCRIBE AND EXPLAIN: TRANSPORTATION OF WATER

To understand the way in which water is transported within plants	<i>Germination</i>	<i>Seed</i>	<i>Growth</i>	<i>Roots</i>	<i>Shoots</i>	<i>Temperature</i>	<i>Warmth</i>	<i>Light</i>
	<i>Air</i>	<i>Carbon Dioxide</i>	<i>Water</i>	<i>Nutrients</i>	<i>Soil</i>	<i>Transportation</i>	<i>Transpiration</i>	<i>Evaporation</i>

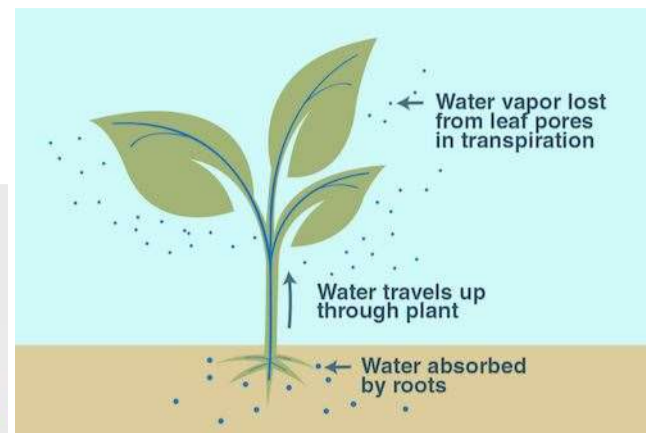
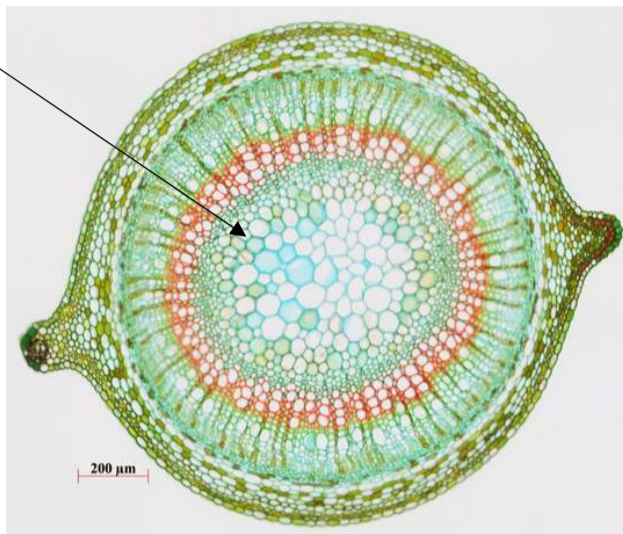
- Learning links:**
- Geography:**
 - Y3 & Y5: Water Cycle Evaporation
 - Y5: Rainforest/Biomes Plant requirements
- Learning links:**
- Gardening:**
 - Y3-6: Plant requirements and growth

Water transportation (movement of water):

Plants **draw up water** from the soil in their **roots**. This **water moves** from the **roots**, up the **stem**, to the **leaves (transportation)**.

The **stem** is made of lots of **tubes**. It is their job to **transport water** from the **roots** to the **leaves and flowers**.

This is **repeated** in a cycle to continuously **deliver fresh water** and **nutrients** from the **soil** to the **leaves**.



THINKING POINT:



How could you test or check whether water really is transported in this way?

EXPLORE AND INVESTIGATE:

- HYPOTHESISE**
ENQUIRE
TEST
RECORD
REPORT
CONCLUDE

How is water transported in plants?

In two pots/vases, place a strong mixture of coloured water.
In Pot A, place white carnations and in Pot B place celery (with leaves still on).
Leave the plants in a hot place (preferably outside) to aid transpiration/evaporation from the leaves.
Observe the coloured water travelling up the xylem tubes in the stem and through the capillaries in to the leaves and petals.
Take photographs, label and write explanation statements of the process of water transpiration and transportation.

KEY ASSESSMENT AND APPLICATION OPPORTUNITIES:

EXS:

- How can water get all the way up to the top of a tall plant? Can you prove that stems transport water?

GDS:

- As a gardening expert, explain to Mr Smith why his plants are unhealthy. He has planted 5 different plants in a small, locked shed with a small, locked window. He put them in good soil and waters them everyday but can't understand why they aren't growing healthily.