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Plants

Contextual Ideas

- Certain factors need to be considered for healthy plant growth and that this can vary from plant to plant.
- That different parts of a flowering plant have a function and that these functions can be explained.
- That flowers play an important role in the life cycle of a plant and each part of the flower has an important role.

National Curriculum Objectives

- identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
- 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
- investigate the way in which water is transported within plants
- explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Additional Support Resources

- Reach Science: Y3 Plants
- Switched on Science 2: Y3 How does your garden grow?

Assessment Outcome






- Essay Question: What effect do conditions have on plant growth?



Scientist Focus

- **Stephen Hales (1677-1761)** Botanist. Experimented with plants and how fluids and gases moved within them.

- **Anna Atkins (1799-1871)** Botanist and photographer.

Science In Action

	Question Knowledge Context	<ul style="list-style-type: none"> • Ask relevant questions which lead to using different types of scientific enquiries to answer them.
	Fair Test Knowledge Context	<ul style="list-style-type: none"> • Set up simple practical enquiries, comparative and fair tests. -Set variables as a class (What will keep the same to make the test fair? What will we change?) -Make predictions • -Explain predictions linked to knowledge. • What conditions (variables) could we change to investigate this? (Reach Lesson1) • Predict what will happen if a carnation is left overnight in coloured water.
	Observe Knowledge Context	<ul style="list-style-type: none"> • <u>Make systematic and careful observations. Take accurate measurements using standard units, including data loggers.</u> • Observe plant growth in their chosen settings/conditions by taking photos/measuring plant growth. • Dissect plant stems when learning about transpiration. • Dissect a flower when learning about parts of a flower. • Germinate a radish or mustard seed in a film canister for a few days then remove from soil to observe the changes. • Use a digital microscope to observe leaves closely.
	Record & Present Knowledge Context	<ul style="list-style-type: none"> • Gather, record, classify and present data in a variety of ways to help answer questions. • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables. • Record how long it takes for a plant to transport water up its stem using coloured liquid. • Record the changes that have occurred in a plant diary.
	Explain Knowledge	<ul style="list-style-type: none"> • Report findings and conclusions from enquiries, including oral and written explanations, displays and presentations.

		<ul style="list-style-type: none"> ● Present their findings orally to the class. ● Essay Question: What effect do conditions have on plant growth?
	Discuss Knowledge Context	<ul style="list-style-type: none"> ● <u>Discuss straightforward scientific evidence and use this to support and provide explanation for their own findings.</u> ● Link their findings from their plant growth investigation to their knowledge of conditions for plant growth.

*Key Science in Action is underlined

1 Session Question

What conditions are needed for healthy plant growth?

Key Concepts

Life processes

Vocabulary

Conditions
Grow
Water
Light
warmth

Nutrients
Variable

Prior Knowledge (Retrieval) YEAR 2

- Plants thrive in warm, sunny and damp conditions, which explains the abundance of new plant growth in the school environment around Springtime.
- Roots are part of a plant that grows downwards, it gets water from the ground, and holds the plant in place.
- The stem is usually the upper part of the plant and it can have branches, leaves and flowers.
- Germination is when a seed begins to grow, using its stored food, and put out roots and shoots.
- Seeds are dormant until the conditions are right (for germination).
- Seeds need water, oxygen, and the right temperature to germinate.
- Plants that are deprived of light, food or air will not grow and will die.
- A bulb is the round underground part of a plant that contains food for the plant, for example, an onion bulb, daffodil bulb, a tulip bulb.

Contextual Knowledge

- Certain conditions aid healthy plant growth.
- Increasing the brightness of light during the day increases growth.
- Plants need a steady supply of water to increase growth (but not too much!)
- Plants will grow more quickly in warm conditions (but not too hot!)
- Plants will grow more quickly when they have nutrients available (which can be found in soil)
- Plant growth can be affected by changing certain variables.
- The independent variable is the thing that you change, such as the amount of light.
- The dependent variable is the thing you observe to see how it is affected, such as plant growth.
- The control variables are the things you have to keep the same to make sure it is a fair test, for example, if you change the amount of light the plant gets, you keep the amount of water they receive the same.

2 Session Question

What are the main parts and functions of a flowering plant?

Key Concepts		Vocabulary	
Life processes		Function Roots Soil Absorb Stem Water Oxygen	Minerals Leaves Food Flowers Seeds Photosynthesis Carbon dioxide
Prior Knowledge (Retrieval)			
<ul style="list-style-type: none"> Increasing the brightness of light during the day increases growth. Plants need a steady supply of water to increase growth (but not too much!) Plants will grow more quickly in warm conditions (but not too hot!) Plants will grow more quickly when they have nutrients available (which can be found in soil) 			
Contextual Knowledge			
<ul style="list-style-type: none"> Most plants have the same basic parts. Each of the parts of the plant has a function that helps the plant to survive. The roots of a plant are usually found growing under the soil. They help to hold the plant in place. They also absorb water and minerals from the soil. Minerals are nutrients that help plants to grow. The stem of the plant supports the plant, it holds it upright. The stem also moves water and minerals from the root to other parts of the plant. The leaves of a plant are where the plant is able to make its own food. They can come in lots of different shapes and sizes. Many plants also have flowers during some parts of the year. Flowers produce seeds which form new plants. Plants make their own food by a process called photosynthesis. Photosynthesis is the process by which plants use sunlight, water, and carbon dioxide to create oxygen and energy in the form of sugar 			

3 Session Question

What are the main parts and functions of a flower?

Key Concepts		Vocabulary	
Life process		Reproduce Seeds Germinate Grow Pollen Ovule	Female Ovary Style Stigma Anther filament
Prior Knowledge (Retrieval)			
<ul style="list-style-type: none"> The roots of a plant are usually found growing under the soil. They help to hold the plant in place. They also absorb water and minerals from the soil. Minerals are nutrients that help plants to grow. The stem of the plant supports the plant, it holds it upright. The stem also moves water and minerals from the root to other parts of the plant. The leaves of a plant are where the plant is able to make its own food. They can come in lots of different shapes and sizes. Many plants also have flowers during some parts of the year. Photosynthesis is the process by which plants use sunlight, water, and carbon dioxide to create oxygen and energy in the form of sugar 			
Contextual Knowledge			
<ul style="list-style-type: none"> The flowering part of a plant is the part where the plant reproduces. It is where seeds are produced that will grow into another, new plant if they reach soil have the right conditions to germinate and grow. Each of the parts of the flower play a role in this process. A seed can be produced any time pollen reaches the ovule in a flower. Ovules are the part of the plant with the female sex cells in them and they can be found at the base of the female part of the plant in a section called the ovary. The main stalk of the female part of the plant is called the style. At the top of the style, you can find a sticky part of the flower which collects pollen. This is called the stigma. Pollen is produced by a part called an anther which can be found on top of a thin stalk called a filament. The sepal is the green part that protects flowers before they open. The ovule is the egg part of the plant that contains female sex cells. The ovary is the part of the plant where the ovules are produced. The style is the long stalk that connects the stigma to the ovary. The stigma is the sticky top of the style that collects pollen. The petal is the outer part of a flower that attracts insects (usually with bright colours). The filament is the thinner long stalk that holds up the anther. The anther is the part that produces pollen (the male sex cell). 			

4 Session Question

What is the lifecycle of a plant?

Key Concepts	Vocabulary
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Life cycles Life processes		Seed Germinate Shoot Root Stem Leaves Flower Pollen	Stigma Stamen Ovary Ovule Fertilisation Fruit Ripe Dispersal
Prior Knowledge (Retrieval)			
<ul style="list-style-type: none"> The flowering part of a plant is the part where the plant reproduces. It is where seeds are produced that will grow into another, new plant if they reach soil have the right conditions to germinate and grow. A seed can be produced any time pollen reaches the ovule in a flower. Ovules are the part of the plant with the female sex cells in them and they can be found at the base of the female part of the plant in a section called the ovary. The main stalk of the female part of the plant is called the style. At the top of the style, you can find a sticky part of the flower which collects pollen. This is called the stigma. Pollen is produced by a part called an anther which can be found on top of a thin stalk called a filament. 			
Contextual Knowledge			
<ul style="list-style-type: none"> A lifecycle is the series of changes in the life of a living organism. All new plants begin their lives as seeds. If the seed is placed in the right conditions, then the seed will begin to grow in a process called germination. Germination involves a shoot coming out the top of a seed and a root beginning to grow downwards. A plant grows with a stem and leaves and a flower is produced (or sometimes many flowers) near the top of the stem. This flower produces pollen on its anther. The pollen is spread from the anther of flowers to the stigma in a process called pollination. The pollen grows and extends through the stamen until it reaches the ovary of the flower. It joins with an ovule in a process called fertilisation. Over time, the ovule develops into a seed and the flower grows into a 'fruit'. When it is ripe, the seeds will leave the plant through a process called seed dispersal. Seeds can be dispersed by explosion, by animals or by the wind. Sycamore seeds (wind) Willow herb (wind) Poppy heads (wind) Dandelion heads (wind) Horse chestnut seeds: conkers (gravity) Coconuts (gravity and then water) Alder (water) Willow (water) Blackberries / berries (animals) Burdock hooks (animals) Sea holly (animals) Oak seeds: acorns (animals) Apple (animals) Peas in pea pod (explosion) Geraniums: (explosion) 			

5 Session Question

How does a plant transport water?

Key Concepts

Life cycles
Life processes

Vocabulary

Stomata
Stoma
Stem
Roots
Absorb
transpiration
wilt

Prior Knowledge (Retrieval)

- All new plants begin their lives as seeds. If the seed is placed in the right conditions, then the seed will begin to grow in a process called germination.
- Germination involves a shoot coming out the top of a seed and a root beginning to grow downwards.
- A plant grows with a stem and leaves and a flower is produced (or sometimes many flowers) near the top of the stem.
- This flower produces pollen on its anther. The pollen is spread from the anther of flowers to the stigma in a process called pollination.
- The pollen grows and extends through the stamen until it reaches the ovary of the flower. It joins with an ovule in a process called fertilisation.
- Over time, the ovule develops into a seed and the flower grows into a 'fruit'. When it is ripe, the seeds will leave the plant through a process called seed dispersal.
- Seeds can be dispersed by explosion, by animals or by the wind.

Contextual Knowledge

- There are small holes on the underneath side of leaves on plants called stomata (or stoma if you are only talking about one of them).
- Water in the plant can escape through the stomata/leaves.
- Water escapes through the leaves more quickly if it is a warm day or if there is a breeze.
- As water exits the leaves, more water is soaked up through the stem of the plant.
- As water is soaked up from the stem of the plant, water is pulled from the roots.
- As water moves from the roots of a plant up to its stem, more water is absorbed from the soil around the roots.
- The process of soaking up water through a plant is called 'Transpiration'.
- If there is not enough water in the soil, there is less water in the stem and the leaves which causes the plant to 'wilt'.