Year 1 - Plants

National Curriculum Objectives/Knowledge Statements (Substantive):

- Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.
- Identify and describe the basic structure of a variety of common flowering plants.
- Identify and name the roots, trunk, branches and leaves of a tree.

Pupils should use the local environment throughout the year to explore and answer questions about plants growing in their habitat. Where possible, they should observe the growth of flowers and vegetables that they have planted.
They should become familiar with common names of flowers, examples of deciduous and evergreen trees, and plant structures (including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem).
Pupils might work scientifically by: observing closely, perhaps using magnifying glasses, and comparing and contrasting familiar plants; describing how they were able to identify and group them, and drawing diagrams showing the parts of different plants including trees.
Pupils might keep records of how plants have changed over time, for example the leaves falling off trees and buds opening; and compare and contrast what they have found out about different plants.

Key Ideas - *Duplicated in Year 2.*

a) Plants usually grow from seeds and bulbs.
b) Plants need warmth, light and water to grow and survive.
c) Flowering plants make seeds to reproduce and make more plants. Some plants die after producing seeds and others live for many generations.

Prior Learning	Breakdown of Lessons		Vocabulary
	Lesson and Big Question	Knowledge (Progression of substantive knowledge – what?) or Science Enquiry/Skill Based Lesson (National Curriculum Working Scientifically Statements – why/how?). These inc: Fair Testing (Asking Scientific Questions, Planning and Enquiry, Observing closely, Drawing Conclusions, Making Predictions, Evaluating an Enquiry), Identifying & Classifying, Observation Over Time (Observing closely), Pattern Seeking/Research	
In Early Years: • Develop an understanding of growth. • Shows care and concern for living things and the environment. • Make observations of plants and explain why some things occur, and talk about changes. • Can talk about some of the things they have observed, such as plants.	Lesson 1 - Alan Titchmarch is a famous gardener. He is trying to grow some broad beans in his garden but is unsure of what he needs for them to grow well. Can he just leave the bean on the grown or do they need certain conditions to grow? Prove it. BIG QUESTION – What do seeds need to grow?	Science Enquiry - Observation over time – plant and seed with correct conditions and observe it's growth (continued throughout the topic).	Leaves, blossom, petals, roots, buds, bulb, trunk, branches, stem, evergreen, garden plants, deciduous, wild plants, seeds, wild plants, garden plants.
	Lesson 2 - Gregor Mendel was a scientist and Augustinian friar (monk) who was famous for his pea plant experiments on plant height, pod shape and colour, seed shape and colour, and flower position and colour. He needs to know what the structure of a plant is and what the different jobs of the plant are to help with his experiments. BIG QUESTION – find the structure and functions of a plant.	Knowledge – Know the structure of a plant.	
	Lesson 3 - Carl Linnaeus (1707 – 10 January 1778) was a Swedish botanist who was a famous scientist that travelled the world naming animals and plants. He wants to discover and name wild plants in your local area – can you help him? BIG Question – what wild plants can you discover and name? What is the most common? Prove it!	Science Enquiry - Research – find the wild plants in the local environment and the most common.	
	Lesson 4 - John Ray (1628-1705) is one of the earliest English botanist who wrote important works on botany and classified plants according to similarities and differences from observations. He wants to discover and name garden plants in your garden – can you help him? BIG Question – what garden plants can you discover and name? What is the most common? Prove it!	Science Enquiry - Research – find the garden plants in the local environment and the most common.	
	Lesson 5 - Owen Charles Johnson MBE is a famous dendrologist which means he studies wooded plants (trees and shrubs). He has spent the last 20 years studying and recording 60,000 trees around Britain. He wants ti to discover and name trees outside and if they are deciduous or evergreen – can you help him. Big Question – what trees can you discover and name? Are they deciduous or evergreen? Prove it	Science Enquiry - Research – find the trees in the local environment and the most common. Knowledge – know the difference between deciduous or evergreen	
	Lesson 6 – Assessment		

In Year 2:

- Observe and describe how seeds and bulbs grow into mature plants.
- Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

Year 2 Plants

National Curriculum Objectives/Knowledge Statements (Substantive):

- Observe and describe how seeds and bulbs grow into mature plants.
- Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

Pupils should use the local environment throughout the year to observe how different plants grow. Pupils should be introduced to the requirements of plants for germination, growth and survival, as well as to the processes of reproduction and growth in plants.
Note: Seeds and bulbs need water to grow but most do not need light; seeds and bulbs have a store of food inside them.
Pupils might work scientifically by: observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb, or observing similar plants at different stages of growth; setting up a comparative test to show that plants need light and water to stay healthy.

Key Ideas

a) Plants usually grow from seeds and bulbs.
b) Plants need warmth, light and water to grow and survive.
c) Flowering plants make seeds to reproduce and make more plants. Some plants die after producing seeds and others live for many generations.

Duplicated in Year 1.

Prior Learning	Breakdown of Lessons		Vocabulary
	Lesson and Big Question	Knowledge (Progression of substantive knowledge – what?) or Science Enquiry/Skill Based Lesson (National Curriculum Working Scientifically Statements/disciplinary – why/how?). These inc: Fair Testing (Asking Scientific Questions, Planning and Enquiry, Observing closely, Drawing Conclusions, Making Predictions, Evaluating an Enquiry), Identifying & Classifying, Observation Over Time (Observing closely), Pattern Seeking/Research	
In Year 1: • Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. • Identify and describe the basic structure of a variety of common flowering plants. • Identify and name the roots, trunk, branches and leaves of a tree.	Lesson 1 - George Washington Carver (1864 – 1943) was a scientist who was famous for making improvements to farming. He recognised that plants grow differently. BIG QUESTION – George Washington Carver would like to know what plants need to grow and stay healthy. Can you help him?	Knowledge / Observation over time – planting. Bulbs and seeds need planting in the 1st lesson to observe. Science Enquiry – Fair Testing / Identifying & Classifying/Pattern Seeking – Set up experiment with different plants in different settings – which grow the best? Predict what they think will happen to the different plants in the different conditions. Knowledge – discuss what plants need to grow/germinate. Discuss fair testing and how we take 1 variable out and have a control. Looking at germination and how different conditions affect the plants and why. Observing healthy and none healthy plants and discussing why.	Observation, growth, compare, record, seeds, bulbs, temperature, roots, stem, predict, leaf, flower, measure, diagram, measure, comparative tests, life cycle, life process, germinate, grain.
	Lesson 2 - This week George Washington Carver (1864 – 1943) is an American scientist and inventor who was famous for making farming better. He planted different crops in rotation because plants grow differently. BIG QUESTION – George Washington Carver could like to know more about how seeds and bulbs grow into mature plants. Can you help him?	Knowledge / Observation over time – planting. Look at the germination of the bulbs and seeds planted. Knowledge – discuss seeds and bulbs and the structure inside. Make sure children are aware they have an embryo, miniature leaves and their own food so they can grow without light as they don't need to photosynthesise. Discuss how they grow and what they need. Science Enquiry – Observing and Identifying – dissecting seeds and bulbs	
	Lesson 3 - Agnes Arber (1879 – 1960) was a British plant morphologist and anatomist, historian of botany and philosopher of biology. She was born in London but lived most of her life in Cambridge. She thinks that all plants have a life cycle that is similar to a human life cycle in stages where seeds and bulbs grow into mature plants and it includes reproduction. BIG QUESTION – Do you agree that all plants have a life cycle like humans where seeds and bulbs grow into mature plants? Prove it.	Knowledge / Observation over time – planting. Look at the germination of the bulbs and seeds planted. Knowledge – know the different stages of a plant life cycle, focus on beans and dandelions and understand about seed dispersal from water, wind, animals and humans.	
	Lesson 4 - Gregor Johann Mendel was an Austrian biologist who worked with pea plants to make discoveries in genetics, he needed to make sure his plants were suited to survive their habitat to germinate to a mature plant. BIG QUESTION – Are plants suited to survive their habitat so they can grow into a mature plant? If so, how?	Knowledge / Observation over time – planting. Look at the germination of the bulbs and seeds planted. Knowledge/observation – To observes features of plants that live in extreme habitats– desert, Artic, rainforest, ocean and why their adaptations helps them to germinate and survive to become mature plants.	

	Lesson 5 – Looking at the results of our experiment set up in week one. Whole Term Experiment for Plants in Various Conditions – Drawing Conclusions. George Washington Carver (1864 – 1943) was a scientist who was famous for making improvements to farming. He recognised that plants grow differently. BIG QUESTION – George Washington Carver would like to know what plants need to grow and stay healthy we will prove this by using the science skills - observing, measuring, recording comparing and drawing conclusions.	Knowledge / Observation over time – planting. Look at the germination of the bulbs and seeds planted. Observing, measuring, recording comparing and drawing conclusions on bulls planted in different conditions – without soil, without light, cold temperature, no water and one with all the conditions we believe the bulb needs to grow into a healthy plant.	
	Lesson 6 - Assessment		

In Year 3:

- Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.
- Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.
- Explain the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow) and how they vary from plant to plant.
- Know the way in which water is transported within plants.

Year 3 Plants

National Curriculum Objectives/Knowledge Statements (Substantive):

- Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.
- Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.
- Explain the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow) and how they vary from plant to plant.
- Know the way in which water is transported within plants.

Pupils should be introduced to the relationship between structure and function: the idea that every part has a job to do. They should explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction.

Note: Pupils can be introduced to the idea that plants can make their own food, but at this stage they do not need to understand how this happens.

Pupils might work scientifically by: 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. They might observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers.

Key Ideas

a) Plants make their own food in their leaves to provide them with energy, growth, repair and reproduce.
b) Leaves absorb sunlight and carbon dioxide.
c) Plants have roots to provide support and to draw moisture from the soil, through stems to take water to the rest of the plant.
d) The plant makes its food from water and carbon dioxide, using sunlight as energy, in the green parts of plants (mainly leaves).
e) Flowering plants have evolved specific parts to carry out pollination, fertilization and seed growth.0
f) Seed dispersal improves chances of enough seeds germinating and growing to mature.
g) Seeds and bulbs need the right conditions to germinate. They contain a food store for the first stages of growth (ie until the plant is able to produce its own food).

Prior Learning	Breakdown of Lessons		Vocabulary
	Lesson and Big Question	Knowledge (Progression of substantive knowledge – what?) or Science Enquiry/Skill Based Lesson (National Curriculum Working Scientifically Statements – why/how?). These inc: Fair Testing (Asking Scientific Questions, Planning and Enquiry, Observing closely, Drawing Conclusions, Making Predictions, Evaluating an Enquiry), Identifying & Classifying, Observation Over Time (Observing closely), Pattern Seeking/Research	
In Year 2: •Observe and describe how seeds and bulbs grow into mature plants. • Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	Lesson 1 – Agnes Arber was a famous botanist born in London in 1879. She carried out research into the anatomy of plants and structures of flowers. BIG QUESTION – Each part of a plant has a different job to do. Do you agree?	Science Enquiry – Identifying & Classifying/Pattern Seeking – labelling parts of plants and researching their jobs.	Air, Light, Water, Nutrients, Soil, Reproduction, Transportation, Dispersal, Pollination, Flower. Photosynthesis Energy Growth Carbon dioxide Oxygen Sugar material
	Lesson 2 – Joseph Gottileb Kolreuter was a German botanist who studied plant fertilisation. He showed that pollen must be transferred from another stigma for fertilisation to happen, BIG QUESTION – What happens during the process of polination?	Knowledge and Observation – how does pollen get transferred from one plant to another?	
	Lesson 3 - Charles Darwin was interested in how seeds were moved from place to place as part of the lifecycle of flowering plants. He thought that birds were important in spreading seeds and conducted experiments to find out if he was right. BIG QUESTION: Seed dispersal is just one important part of the plant life cycle. Do you agree?	Knowledge – know the different stages of a plant life cycle.	
	Lesson 4 - Stephen Hales was born in England in 1677. He is thought to be the first person to discover transpiration of water in plants. He placed one of the roots into a tube of water to measure how much water travelled through the root. Big Question: Water travels through a plant. Can you prove it?	Science Enquiry – Observation over time, set up experiment to see what happens as water with food colouring travels through a plant.	

	Lesson 5 - Van Helmont was a Dutch Chemist born in January 1580. He was interested in finding out what plants needed to be able to live and grow well. He carried out a series of experiments with a willow tree and water and concluded that plants only need water to grow. Do you agree with Van Helmont? BIG QUESTION: What do Plants need to grow well?	Science Enquiry – Fair Testing / Identifying & Classifying/Pattern Seeking – Set up experiment with different plants in different settings – which grow the best?	
In UKS2: • Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago • Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents • Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.			

Christ the King Catholic Primary School

Science Progression from EYFS to Year 6