Science Curriculum

Bosley St. Mary's CE Primary School

CDAT
Chester Diocesan Academies Trust

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Curriculum Overview

- Our mixed-age classes necessitates that we organise our science curriculum in a different way to that laid out in the National Curriculum. We have created a rolling programme based on the year-groups in each class. The length of the programme is as follows:
    - **Blossom Class** (EYFS and Year 1): One year rolling programme with differing content so that children learn something new each year.
    - **Willow Class** (Year 2 and Year 3): Two year rolling programme
    - **Oak Class** (Year 4, Year 5 and Year 6): Three year rolling programme

- Teaching a rolling programme in mixed age classes means that some children will encounter a science objective outside of the year of study. To ensure depth of study, we have grouped objectives together under a science topic. For example, Living Things and Their Habitats is in the National Curriculum programme of study for years 4, 5, and 6. Children in Oak Class will be taught this topic once during their three years in the class and all objectives will be covered.

- We are comfortable that there is enough difference in content for children to learn something new every year. Further, where children encounter objectives out of year group, the work will be suitably differentiated for them to apply their prior knowledge. Finally, by the end of the key stage, children will have completed the programme of study and will therefore be prepared for the next stage in their learning.

- This document contains the following sections:
    - **Rolling Science Programme** detailing what is taught in each year of the cycle.
    - **Science Programme of Study** listing the key knowledge, skills and vocabulary pupils should encounter during each topic. This section also contains maths and reading links as well as ideas for outdoor learning.
    - **Progression in Science Knowledge** and **Progression in Working Scientifically** demonstrates how knowledge and skills are built sequentially throughout the science curriculum.

Rolling Science Programme

Year A

Class	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Blossom	Everyday Materials Seasonal Changes		Plants Seasonal Changes		Animals including Humans Seasonal Changes	
Willow	Everyday Materials		Rocks	Living Things and Their Habitats		Light
Oak	Motions and Forces		Evolution and Inheritance		Light	Sound

Year B

Class	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Blossom						
Willow	Forces and Magnets		Plants		Animals including Humans	
Oak	Everyday Materials and Changing States		Animals including Humans			The Earth

Year C

Class	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Blossom						
Willow						
Oak	Electricity		Living Things and Their Habitats			States of Matter

Blossom Class – Science Programme of Study

Class	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Blossom	Everyday Materials Seasonal Changes		Plants Seasonal Changes		Animals including Humans Seasonal Changes	

Seasonal Changes

Class	Blossom	**Curriculum Year**	A

Big Questions	● What are the four seasons and what happens in each one? ● What is the weather like in the different seasons? ● When do the four seasons occur in the year? ● How does the length of the day change over the year?

Knowledge	**Skills**	**Vocabulary**
● To know the weather associated with the four seasons and how day length varies	● Observe changes across the four seasons ● Make charts to show how day length changes	● Autumn ● Day ● Month ● Season ● Spring ● Summer ● Weather ● Week ● Winter ● Year
Early Learning Goal: The Natural World Children at the expected level of development will: ● Explore the natural world around them, making observations and drawing pictures of animals and plants; ● Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; ● Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	**Development Matters** <u>Three- and Four-Year-Olds</u> ● Use all their senses in hands-on exploration of natural materials. ● Talk about what they see, using a wide vocabulary. ● Explore how things work. ● Begin to understand the need to respect and care for the natural environment and all living things. ● Explore and talk about different forces they can feel. <u>Children in Reception</u> ● Explore the natural world around them. ● Describe what they see, hear and feel whilst outside.	

Knowledge	Skills	Vocabulary
	● Recognise some environments that are different to the one in which they live. ● Understand the effect of changing seasons on the natural world around them.	

Everyday Materials

Class	Blossom	Curriculum Year	A

Big Questions	● What are some different types of materials? ● How are materials different and the same? ● What are different materials used to make?

Knowledge	Skills	Vocabulary
● Distinguish between an object and the material from which it is made ● Know and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock ● Know the simple physical properties of a variety of everyday materials ● Compare and group together a variety of everyday materials on the basis of their simple physical properties.	● Describe the simple physical properties of a variety of everyday materials ● Ask questions about every day materials ● Perform a simple test to identify the best material for a particular function (e.g. best material for an umbrella or lining a dog's basket) ● Use ideas and observations to suggest answers to the above the question ● Gather and record data to help answer the above question	● Absorbent / not absorbent ● Bendy / not bendy ● Brick ● Dull ● Elastic Foil ● Fabric ● Glass ● Hard ● Made ● Material ● Metal ● Object ● Opaque ● Paper ● Plastic ● Properties ● Rock ● Rough ● Shiny ● Smooth ● Soft ● Transparent ● Water ● Waterproof / not waterproof
Early Learning Goal: The Natural World Children at the expected level of development will: ● Explore the natural world around them, making observations and drawing pictures of animals and plants; ● Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; ● Understand some important processes and changes in the natural world around them,	**Development Matters** Three and Four Year Olds ● Use all their senses in hands-on exploration of natural materials. ● Explore collections of materials with similar and/or different properties. ● Talk about what they see, using a wide vocabulary. ● Explore how things work. ● Talk about the differences between materials and changes they notice. <u>Children in Reception</u>	

Knowledge	Skills	Vocabulary
including the seasons and changing states of matter.	• Explore the natural world around them. • Describe what they see, hear and feel whilst outside. • Recognise some environments that are different to the one in which they live.	• Wood

Plants

Class	Blossom	Curriculum Year	A

Big Questions	• What are some different types of wild and garden plants? • What's the difference between deciduous and evergreen trees? • What are the different parts of plants?

Knowledge	Skills	Vocabulary
• To know and name a variety of common wild and garden plants, including deciduous and evergreen trees • To know and describe the basic structure of a variety of common flowering plants, including trees. • To know and name: leaves, flowers, and blossom	• Explore and ask questions about plants growing in their habitat • Use their observations to answers their questions • Observe the growth of flowers and vegetables that they have planted • Observe plants closely using magnifying glasses • Compare and contract familiar plants • Record how plants have changed over time (for example the leaves falling off trees and buds opening) • Observe changes across the four seasons	• Blossom • Branches • Bulb • Deciduous • Evergreen • Flowering • Flowers • Fruit • Leaves • Petal • Plant • Root • Seed • Stem • Tree • Trunk
Early Learning Goal: The Natural World Children at the expected level of development will: • Explore the natural world around them, making observations and drawing pictures of animals and plants; • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class;	**Development Matters** <u>Three- and Four-Year-Olds</u> • Use all their senses in hands-on exploration of natural materials. • Talk about what they see, using a wide vocabulary. • Plant seeds and care for growing plants. • Understand the key features of the life cycle of a plant and an animal.	

Knowledge	Skills	Vocabulary
● Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	● Begin to understand the need to respect and care for the natural environment and all living things. <u>Children in Reception</u> ● Explore the natural world around them. ● Describe what they see, hear and feel whilst outside. ● Recognise some environments that are different to the one in which they live. ● Understand the effect of changing seasons on the natural world around them.	

Animals Including Humans

Class	Blossom	Curriculum Year	A

Big Questions	● What are the names of some different animals? ● What do carnivores, herbivores and omnivores eat? ● How are animals' bodies different? ● Which parts of the body to humans use for the different senses?

Knowledge	Skills	Vocabulary
● To know and name a variety of common animals including fish, amphibians, reptiles, birds and mammals ● To know and name a variety of common animals that are carnivores, herbivores and omnivores ● To know and describe the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) ● To know and name the basic parts of the human body and say which part of the body is associated with each sense.	● Identify and classify a variety of common animals including fish, amphibians, reptiles, birds and mammals ● Identify and classify whether a common animal is a carnivore, herbivore or omnivore ● Compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) ● Identify, draw and label the basic parts of the human body and say which part of the body is associated with each sense. ● Pattern seeking to see if the tallest children are the oldest.	● Amphibians ● Animals ● arms ● Birds ● Carnivores ● Ears ● Eyes ● Feet leg ● Fish ● Hands ● Hear ● Herbivores ● Human body ● Label ● Mammals
Early Learning Goal: The Natural World	**Development Matters** <u>Three- and Four-Year-Olds</u>	

Knowledge	Skills	Vocabulary
Children at the expected level of development will: ● Explore the natural world around them, making observations and drawing pictures of animals and plants; ● Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; ● Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	● Use all their senses in hands-on exploration of natural materials. ● Talk about what they see, using a wide vocabulary. ● Explore how things work. ● Understand the key features of the life cycle of a plant and an animal. ● Begin to understand the need to respect and care for the natural environment and all living things. <u>Children in Reception</u> ● Explore the natural world around them. ● Describe what they see, hear and feel whilst outside. ● Recognise some environments that are different to the one in which they live.	● Mouth ● Neck ● Nose ● Omnivores ● Pets ● Reptiles ● See ● Sense ● Smell ● Structure ● Taste ● Touch

Willow Class – Science Programme of Study

Class	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year A	Everyday Materials		Rocks	Living Things and Their Habitats		Light
Year B	Forces and Magnets		Plants		Animals including Humans	

Plants (Two Cycles)

Class	Willow	**Curriculum Year**	A

Big Questions	● How do plants grow? ● What do plants need to be healthy? ● What do the different parts of a plant do? ● What do plants need for life and growth? ● How is water transported in plants? ● Why do some plants have flowers?

Knowledge	**Skills**	**Vocabulary**
● To know how seeds and bulbs grow into mature plants ● To know that plants need water, light and a suitable temperature to grow and stay healthy. ● To know the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers ● To know 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 know the way in which water is transported within plants ● To know the part that flowers play in the life cycle of flowering plants, including	● Observe using magnifying glasses and describe how seeds and bulbs grow into mature plants ● Record with some accuracy how the height of a plant changes over time ● Perform a simple comparative test to show that plants need light and water to stay healthy ● Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers ● Investigate the way in which water is transported within plants ● Observe how water is transported in plants ● Record findings using labelled diagrams (to show the parts and functions of a plant) ● Observe the different stages of plant life cycles over a period of time ● Pattern seeking in the time it takes different plants to grow	● Air ● Function ● Germination ● Healthy ● Life cycle ● Light ● Mature plant ● Needs ● Nutrients ● Pollination ● Requirement ● Seed dispersal ● Seed formation ● Suitable temperature ● Transported ● Vary

Knowledge	Skills	Vocabulary
pollination, seed formation and seed dispersal.		• Water

Animals Including Humans (Two Cycles)

Class	Willow	Curriculum Year	A

Big Questions	• How do animals grow? • What are the basic needs of animals? • How can humans keep healthy? • What does nutrition mean for humans? • Why do some animals have skeletons and muscles?

Knowledge	Skills	Vocabulary
• To know that animals, including humans, have offspring which grow into adults • To know and describe the basic needs of animals, including humans, for survival (water, food and air) • To know and describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. • To know that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat • To know that humans and some other animals have skeletons and muscles for support, protection and movement.	• Find out about the basic needs of animals, including humans, for survival (water, food and air) • Ask questions about different life cycles (e.g. egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep) • Observe (in real life or through video clips) changes in different life cycles (e.g. egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep) • Ask questions about what things animals need for survival and what humans need to stay healthy • Use their observations to suggest answers to questions • Suggest ways of finding out the answers to their questions • Identify and classify animals with and without skeletons • Compare and contrast the diets of different animals and decide ways of grouping them according to what they eat • Research different food groups and how they keep us healthy	• Adults • Air • Basic needs • Exercise • Food • Growth • Hygiene • Movement • Muscles • Nutrients • Offspring • Protection • Reproduction • Skeleton • Support • Survival • Survival • Water

Living Things and Their Habitats

Class	Willow	Curriculum Year	A

Big Questions	● What's the difference between living, dead and never alive? ● How do different environments provide for the basic needs of animals and plants? ● How do animals adapt to their environments? ● What's a food chain?

Knowledge	Skills	Vocabulary
● To know the differences between things that are living, dead, and things that have never been alive ● To know how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other ● Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.	● Observe, explore and compare the differences between things that are living, dead, and things that have never been alive ● Sort and classify things according to whether they are living, dead, or have never been alive ● Ask questions to help them sort and classify things according to whether they are living, dead, or have never been alive ● Identify that most living things live in habitats to which they are suited and describe ● Observe, identify and name a variety of plants and animals in their habitats, including microhabitats	● Basic needs ● Classify ● Dead ● Food chain ● Habitat ● Living ● Never been alive ● Observe ● Sort ● Sources of food

Materials

Class	Willow	Curriculum Year	A

Big Questions	● Why do we use different materials to make different things? ● How can the shape of solid objects be changed?

Knowledge	Skills	Vocabulary
● To know the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses	● Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses	● Bending ● Solid objects ● Squashing ● Stretching

● To know how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	● Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching ● Compare the uses of every day materials in and around school with materials found in other places (e.g. home / the park) ● Obverse, and record these observations about how materials are used ● Identifying and classifying the uses of different materials	● Twisting

Rocks

Class	Willow	**Curriculum Year**	B

Big Questions	● What are the different types of rocks? ● How are fossils formed? ● What is soil made from?

Knowledge	**Skills**	**Vocabulary**
● To know that different kinds of rocks are grouped together on the basis of their appearance and simple physical properties ● Describe in simple terms how fossils are formed when things that have lived are trapped within rock ● To know and recognise that soils are made from rocks and organic matter.	● Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties ● Observe different types of rocks in and around the local area and the purpose for which they have been used ● Ask questions about why rocks might have changed over time ● Classify and group rocks according to whether they have grains or crystals, and whether they have fossils in them (by using hand lenses or microscopes) ● Ask and answer questions about why soils are formed ● Use knowledge gained to make model fossil and then report this to the rest of the class as a display.	● Crystals ● Fossils ● Grains ● Igneous ● Lenses ● Metamorphic ● Microscope ● Rock ● Sedimentary ● Soil ● Volcanic

Motion and Forces

Class	Willow	**Curriculum Year**	B

Big Questions	● How do objects move on different surfaces? ● Do all objects need contact with something to move? ● What does it mean when we say a magnet attract or repels something? ● What sort of materials are magnetic?

Knowledge	**Skills**	**Vocabulary**
● To know how things move on different surfaces notice that some forces need contact between two objects, but magnetic forces can act at a distance ● To know how magnets attract or repel each other and attract some materials and not others ● To know that a variety of everyday materials can be grouped together on the basis of whether they are attracted to a magnet, and identify some magnetic materials ● To know that magnets have two poles	● Compare how things move on different surfaces notice that some forces need contact between two objects, but magnetic forces can act at a distance ● Observe how magnets attract or repel each other and attract some materials and not others ● Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials ● Predict whether two magnets will attract or repel each other, depending on which poles are facing ● Ask relevant questions about how things move on different surfaces ● Set up simple practical enquiries to find out how things move on different surfaces and identify changes that could be made to raise further questions. ● Sorting materials into those that are magnetic and those that are not ● Looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another ● Report on findings from enquiries using a presentation of results. ● Pattern seeking to see if all feathers fall in the same way	● Contact ● Force ● Friction ● Magnet ● Magnetic ● Motion ● Pull ● Push

Light

Class	Willow	**Curriculum Year**	B

Big Questions	● What is light and dark? ● How are shadows formed? ● What are some sources of light? ● How are reflections made?

Knowledge	**Skills**	**Vocabulary**
● To know that they need light in order to see things and that dark is the absence of light ● To know that light is reflected from surfaces ● To know that light from the sun can be dangerous and that there are ways to protect their eyes ● To know that shadows are formed when the light from a light source is blocked by an opaque object	● Observe how shadows change throughout the day ● Record observations using scientific language, labelled diagrams and bar charts ● Find patterns in the way that the size of shadows changes. ● Gather, record and present data to help answer questions.	● Absence ● Dark ● Light ● Light source ● Opaque ● Protect ● Reflect ● Shadow ● Transparent

Oak Class – Science Programme of Study

Class	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year A	Motions and Forces		Evolution and Inheritance		Light	Sound
Year B	Everyday Materials and Changing States		Animals including Humans			The Earth
Year C	Electricity		Living Things and Their Habitats			States of Matter

Sound

Class	Oak	**Curriculum Year**	A

Big Questions	● How does sound travel? ● How do we hear sounds? ● What happens to sound as we move further away?

Knowledge	**Skills**	**Vocabulary**
● To know how sounds are made, associating some of them with something vibrating ● To know that vibrations from sounds travel through a medium to the ear ● To know that sounds get fainter as the distance from the sound source increases.	● Find patterns between the pitch of a sound and features of the object that produced it ● Find patterns between the volume of a sound and the strength of the vibrations that produced it ● Identify differences and similarities between sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses ● Take accurate measurements (using data loggers) to record the volume at different places around the school ● Record their findings using a chart or table ● Report their findings in an oral / written explanation	● Data logger ● Decibels ● Fainter ● Louder ● Pitch ● Quieter ● Sound ● Vibration ● Volume ● Wave ● Wavelength

Animals including Humans (Three Cycles)

Class	Oak	Curriculum Year	A

Big Questions	● What does the digestive system do? ● Why do we have teeth? ● How doe humans change? ● How does blood travel? ● Is there more than one type of food chain? ● How do humans stay healthy?

Knowledge	Skills	Vocabulary
● To know the simple functions of the basic parts of the digestive system in humans ● To know the different types of teeth in humans and their simple functions ● To know and understand a variety of food chains, identifying producers, predators and prey. ● To know the changes as humans develop to old age. ● To know and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood ● To know and recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function ● To know the ways in which nutrients and water are transported within animals, including humans.	● Describe the simple functions of the basic parts of the digestive system in humans. ● Identify the different types of teeth in humans and their simple functions. ● Create a labelled diagram to show the different types of teeth ● Make systematic and careful observations about the damage different substances can do to teeth. ● Use the results of their observations to draw simple conclusions about how to look after and protect our teeth ● Construct and interpret a variety of food chains, identifying producers, predators and prey. ● Pattern seeking to see whether there is a pattern between height and foot size. ● Recording data for the length and mass of babies as they grow on a line graph ● Research the gestation period of different animals and compare them with humans ● Pattern Seeking – how does different physical attributes impact how far a person can throw something? ● Identify the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood ● Planning a scientific enquiry to identify the impact of exercise on the human body, including recognising and controlling variables	● Adolescence ● Blood ● Blood vessels ● Canine ● chew ● Childhood ● Circulatory system ● Colon ● Develop ● Digestive system ● Fertilisation ● Foetus ● Food chain ● Gestation period ● Heart ● Incisor ● Large intestine ● Molar ● Mouth ● Oesophagus ● Old age ● Pancreas ● Physical / mechanical break down ● Predator ● Prey ● Producer ● Saliva

Knowledge	Skills	Vocabulary
	● Taking measurements with increasing accuracy and precision and repeating readings where appropriate to record heart-rate during exercise ● Identify scientific evidence by exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.	● Salivary gland ● Small intestine ● Stomach ● Swallow ● Teeth

Living Things and Their Habitats (Three Cycles)

Class	Oak	**Curriculum Year**	A

Big Questions	● How do scientists group and classify living things? ● How do environments support life? ● Do different animals have different life cycles? ● How do plants and animals reproduce?

Knowledge	**Skills**	**Vocabulary**
● To know and recognise that living things can be grouped in a variety of ways ● To know that environments can change and that this can sometimes pose dangers to living things. ● To know how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals ● To know reasons for classifying plants and animals based on specific characteristics. ● Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird ● To know the life process of reproduction in some plants and animals.	● Classify and group living things in a variety of ways. ● Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. ● Make systematic and careful observations of how habitats in the local environment change throughout the year in particular using a thermometer to accurately measure the temperature at different points throughout the year. ● Gather, record and present data to help answer questions. ● Record their findings using simple scientific language and a key. ● Through observations classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals). ● Identify scientific evidence to support classification ● Describe the life process of reproduction in some plants and animals. ● Observe and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times) ● Asking questions and suggesting reasons for similarities and differences ● Observe changes over time in animals (e.g. chicks hatching) either in real life or through video footage	● Amphibian ● Bacteria ● Bird ● Characteristics ● Classification key ● Environment ● Fungus ● Insect ● Mammal ● Microorganism ● Reproduction ● Thermometer ● Virus

States of Matter

Class	Oak	Curriculum Year	A

Big Questions	● How do scientists identify materials? ● How do materials change when they are heated or cooled? ● What happens in the water cycle?

Knowledge	Skills	Vocabulary
● To know how to identify if a material is a solid, liquid or gas ● To know that some materials change state when they are heated or cooled ● To know the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	● Compare and group materials together, according to whether they are solids, liquids or gases ● Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) ● Classify and group a variety of different materials ● Setting up simple practical enquires to compare the melting temperature of different substances ● Record findings about the melting temperature of different substances using scientific language ● Report the findings from the above enquiry ● Use the results to draw simple conclusions and make predications ● Identify the similarities and differences in the melting point of different materials ● Observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line	● Cooled ● Degrees Celsius ● Evaporate ● Gas ● Heated ● Liquid ● Particles ● Solid ● State

Electricity (Two Cycles)

Class	Oak	Curriculum Year	A

Big Questions	
	● How do circuits work? ● What are conductors and insulators? ● How do we draw circuits? ● What do switches do?

Knowledge	Skills	Vocabulary
● To know common appliances that run on electricity ● To know the names of the basic parts of a simple circuit including cells, wires, bulbs, switches and buzzers ● To know that a lamp will only light up if it is part of a complete loop with a battery ● To know that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit ● To know some common conductors and insulators, and associate metals with being good conductors. ● To know that the brightness of a lamp or the volume of a buzzer is associated with the number and voltage of cells used in the circuit ● To know that switches can be used to complete / break a circuit to turn it on or off	● Construct safely a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers ● Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery ● Draw circuits (as pectoral representations not circuit symbols) using scientific language to label the components ● Set up a simple practical enquiry as a fair test to investigate what happens to a bulb when more cells are added ● Observe what happens to a bulb when more cells are added ● Record their findings in a table using scientific language (such as brighter / dimmer) ● Set up a simple practical enquiry to investigate which materials conduct / insulate electricity ● Use the results of the above investigation to draw simple conclusions and make predictions about which materials may conduct electricity ● Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches ● Draw circuit diagrams using symbols to represent the components ● Plan a scientific enquiry to identify the relationship between the voltage of a cell and the performance of the component in the circuit ● Use the results to make predictions and set up a further investigation ● Report and present the findings from their investigation	● Amp ● Appliance ● Battery ● Brighter ● Bulb ● Buzzer ● Cell ● Circuit ● Circuit diagram ● Conduct ● Current ● Dimmer ● Electricity ● Insulate ● Louder ● Performance ● quieter ● Switch ● Symbol ● Voltage ● Wire

Knowledge	Skills	Vocabulary
• To know symbols when representing a simple circuit in a diagram.		

Motions and Forces

Class	Oak	Curriculum Year	B

Big Questions	• What is gravity? • What is resistance? • How can a smaller force have a greater effect?

Knowledge	Skills	Vocabulary
• Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • Identify the effects of air resistance, water resistance and friction, that act between moving surfaces • Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	• Ask questions about how different objects fall • Observe how different objects fall • Observe the effects of friction on different objects (in real life or video footage) • Identify scientific evidence to support understanding of gravity – Sir Isaac Newtons theory • Plan scientific enquiry to investigate the most effective parachute or boat, recognise and control variables where necessary • Take measurements with increasing accuracy and precision, taking repeat readings when appropriate to record the speed at which parachutes fall or the boat travels • Record the data from the above investigation • Report the findings of the above investigation • Observe how levers, pulleys and gears work • Present findings of how levers, pulleys and gears work using scientific diagrams and labels • Pattern seeking – The earth takes about 365 days to go around the sun. Does every planet take the same amount of time to go around the sun? Is there a pattern between the size	• Air resistance • Friction • Gears • Gravity • Levers • Mechanisms • Pulleys • Sir Isaac Newton • Surfaces • Theory • Variables • Water resistance

Knowledge	Skills	Vocabulary
	of the planet and the time it takes? Is there a patter between the distance the planet is from the sun and the time it takes?	

Light

Class	Oak	Curriculum Year	B

Big Questions	● How does light travel? ● How do we see things?

Knowledge	Skills	Vocabulary
● To know that light appears to travel in straight lines ● To know that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes	● Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye ● Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. ● Design and make a periscope to explain how it works ● Observe different phenomena (such as rainbows, colours on soap bubbles, objects looking bent in water and coloured filters) and record their findings using labelled diagrams	● Absence ● Dark ● Light ● Light source ● Opaque ● Periscope ● Protect ● Reflect ● Shadow ● Shape ● Straight line ● Transparent

Evolution and Inheritance

Class	Oak	Curriculum Year	C

Big Questions	● How do scientists know that living things have changed? ● How are living things different to their parents? ● How do animals and plants adapt to suit their environment?

Knowledge	Skills	Vocabulary
● To know and recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago ● To know and recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents ● To know how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution	● Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution ● Identify and research scientific evidence that supports the theory of evolution	● Adapted ● Adaption ● Charles Darwin ● Evolution ● Fossils ● Inheritance ● Offspring ● Scientist ● Survival of the fittest ● Theorist ● Theory of evolution

The Earth

Class	Oak	Curriculum Year	C

Big Questions	● How do planets move in the solar system? ● How does the moon move? ● What shape is the sun, Earth and moon?

Knowledge	Skills	Vocabulary
● To know that the sun is a star at the centre of our solar system and that is has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a ‘dwarf planet in 2006) that orbit it.	● Use the idea of the Earths rotation to explain day and night and the apparent movement of the sun across the sky. ● Identify scientific evidence to support or refute ideas about the movement of bodies within in the solar system - Geocentric / Heliocentric	● Celestial body ● Dwarf planet ● Earth ● Geocentric ● Heliocentric ● Jupiter ● Mars ● Mercury

Knowledge	Skills	Vocabulary
• To know the movement of the Earth, and other planets, relative to the Sun in the solar system • To know the movement of the Moon relative to the Earth • To know that the Sun, Earth and Moon are approximately spherical bodies	• Take measurements to create scaled scientific drawings of the relative sizes of the earth, sun and moon • Record the length of the day at different times over the year using an appropriate graph	• Neptune • Planet • Saturn • Solar system • Star • Sun • Uranus • Venus

Materials (including Changing State)

Class	Oak	Curriculum Year	C

Big Questions	• How do materials change in liquid? • How can mixtures be separated? • Why are some materials used for different items? • What's the difference between reversible and irreversible changes?

Knowledge	Skills	Vocabulary
• To know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution • To use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic • To know that dissolving, mixing and changes of state are reversible changes • To know that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.	• Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets • Demonstrate that dissolving, mixing and changes of state are reversible changes • Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. • Planning different types of scientific enquiry to answer questions (for example 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?)	• Conclusion • Conductivity (electrical and thermal) • Dissolve • Evaporation • Filtering • Hardness • Magnet • Magnetic • Measure • Mixture • Separation • Sieving • Solubility • Solute • Solution • Solvent • Transparency

Knowledge	Skills	Vocabulary
	● Observe and compare what happens during reversible and irreversible changes ● Take measurements using a range of scientific equipment with increasing accuracy (e.g. temperature) when carrying out fair tests ● Use test results, from the fair test to make predictions to set up further comparative fair tests ● Report and present findings from enquiries, including conclusions, causal relationships and explanations and of degree of trust in results	

Progression in Science Knowledge

Plants – Progression in Knowledge

For a child to have met expectations, they will have developed the following knowledge by the end of their time in each class.

Class	Knowledge
Blossom (EYFS)	**Early Learning Goal: The Natural World** Children at the expected level of development will: ● Explore the natural world around them, making observations and drawing pictures of animals and plants; ● Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; ● Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
Blossom Y1	● To know and name a variety of common wild and garden plants, including deciduous and evergreen trees ● To know and describe the basic structure of a variety of common flowering plants, including trees. ● To know and name: leaves, flowers and blossom
Willow Y2, Y3	● To know how seeds and bulbs grow into mature plants ● To know that plants need water, light and a suitable temperature to grow and stay healthy. ● To know the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers ● To know 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 know the way in which water is transported within plants ● To know the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.
Oak Y4, Y5, Y6	

Animals including Humans – Progression in Knowledge

For a child to have met expectations, they will have developed the following knowledge by the end of their time in each class.

Class	Knowledge
Blossom (EYFS)	**Early Learning Goal: The Natural World** Children at the expected level of development will: ● Explore the natural world around them, making observations and drawing pictures of animals and plants; ● Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; ● Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
Blossom Y1	● To know and name a variety of common animals including fish, amphibians, reptiles, birds and mammals ● To know and name a variety of common animals that are carnivores, herbivores and Omnivores ● To know and describe the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) ● To know and name the basic parts of the human body and say which part of the body is associated with each sense.
Willow Y2, Y3	● To know that animals, including humans, have offspring which grow into adults ● To know and describe the basic needs of animals, including humans, for survival (water, food and air) ● To know and describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. ● To know that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat ● To know that humans and some other animals have skeletons and muscles for support, protection and movement.
Oak Y4, Y5, Y6	● To know the simple functions of the basic parts of the digestive system in humans ● To know the different types of teeth in humans and their simple functions ● To know and understand a variety of food chains, identifying producers, predators and prey. ● To know the changes as humans develop to old age. ● To know and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood ● To know and recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function ● To know the ways in which nutrients and water are transported within animals, including humans.

Living Things and Their Habitats – Progression in Knowledge

For a child to have met expectations, they will have developed the following knowledge by the end of their time in each class.

Class	Knowledge
Blossom (EYFS)	**Early Learning Goal: The Natural World** Children at the expected level of development will: ● Explore the natural world around them, making observations and drawing pictures of animals and plants; ● Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; ● Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
Blossom Y1	
Willow Y2, Y3	● To know the differences between things that are living, dead, and things that have never been alive ● To know how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other ● Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.
Oak Y4, Y5, Y6	● To know and recognise that living things can be grouped in a variety of ways ● To know that environments can change and that this can sometimes pose dangers to living things. ● Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird ● To know the life process of reproduction in some plants and animals. ● To know how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals ● To know reasons for classifying plants and animals based on specific characteristics.

Materials – Progression in Knowledge

For a child to have met expectations, they will have developed the following knowledge by the end of their time in each class.

Class	Knowledge
Blossom (EYFS)	**Early Learning Goal: The Natural World** Children at the expected level of development will: ● Explore the natural world around them, making observations and drawing pictures of animals and plants; ● Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; ● Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
Blossom Y1	● Distinguish between an object and the material from which it is made ● Know and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock ● Know the simple physical properties of a variety of everyday materials
Willow Y2, Y3	● To know the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses ● To know how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching
Oak Y4, Y5, Y6	● To know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution ● To use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating ● Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic ● To know that dissolving, mixing and changes of state are reversible changes ● To know that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.

Sound – Progression in Knowledge

For a child to have met expectations, they will have developed the following knowledge by the end of their time in each class.

Class	Knowledge
Blossom (EYFS)	**Early Learning Goal: The Natural World** Children at the expected level of development will: ● Explore the natural world around them, making observations and drawing pictures of animals and plants; ● Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; ● Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
Blossom Y1	
Willow Y2, Y3	
Oak Y4, Y5, Y6	● To know how sounds are made, associating some of them with something vibrating ● To know that vibrations from sounds travel through a medium to the ear ● To know that sounds get fainter as the distance from the sound source increases

Electricity – Progression in Knowledge

For a child to have met expectations, they will have developed the following knowledge by the end of their time in each class.

Class	Knowledge
Blossom (EYFS)	**Early Learning Goal: The Natural World** Children at the expected level of development will: ● Explore the natural world around them, making observations and drawing pictures of animals and plants; ● Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; ● Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
Blossom Y1	
Willow Y2, Y3	
Oak Y4, Y5, Y6	● To know common appliances that run on electricity ● To know the names of the basic parts of a simple circuit including cells, wires, bulbs, switches and buzzers ● To know that a lamp will only light up if it is part of a complete loop with a battery ● To know that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit ● To know some common conductors and insulators, and associate metals with being good conductors. ● To know that the brightness of a lamp or the volume of a buzzer is associated with the number and voltage of cells used in the circuit ● To know that switches can be used to complete / break a circuit to turn it on or off ● To know symbols when representing a simple circuit in a diagram.

Light – Progression in Knowledge

For a child to have met expectations, they will have developed the following knowledge by the end of their time in each class.

Class	Knowledge
Blossom (EYFS)	**Early Learning Goal: The Natural World** Children at the expected level of development will: ● Explore the natural world around them, making observations and drawing pictures of animals and plants; ● Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; ● Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
Blossom Y1	
Willow Y2, Y3	● To know that they need light in order to see things and that dark is the absence of light ● To know that light is reflected from surfaces ● To know that light from the sun can be dangerous and that there are ways to protect their eyes ● To know that shadows are formed when the light from a light source is blocked by an opaque object
Oak Y4, Y5, Y6	● To know that light appears to travel in straight lines ● To know that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes

States of Matter – Progression in Knowledge

For a child to have met expectations, they will have developed the following knowledge by the end of their time in each class.

Class	Knowledge
Blossom (EYFS)	**Early Learning Goal: The Natural World** Children at the expected level of development will: ● Explore the natural world around them, making observations and drawing pictures of animals and plants; ● Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; ● Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
Blossom Y1	
Willow Y2, Y3	
Oak Y4, Y5, Y6	● To know how to identify if a material is a solid, liquid or gas ● To know that some materials change state when they are heated or cooled ● To know the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature

Motion and Forces – Progression in Knowledge

For a child to have met expectations, they will have developed the following knowledge by the end of their time in each class.

Class	Knowledge
Blossom (EYFS)	**Early Learning Goal: The Natural World** Children at the expected level of development will: ● Explore the natural world around them, making observations and drawing pictures of animals and plants; ● Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; ● Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
Blossom Y1	
Willow Y2, Y3	● To know how things move on different surfaces notice that some forces need contact between two objects, but magnetic forces can act at a distance ● To know how magnets attract or repel each other and attract some materials and not others ● To know that a variety of everyday materials can be grouped together on the basis of whether they are attracted to a magnet, and identify some magnetic materials ● To know that magnets have two poles
Oak Y4, Y5, Y6	● Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object ● Identify the effects of air resistance, water resistance and friction, that act between moving surfaces ● Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Rocks – Progression in Knowledge

For a child to have met expectations, they will have developed the following knowledge by the end of their time in each class.

Class	Knowledge
Blossom (EYFS)	**Early Learning Goal: The Natural World** Children at the expected level of development will: ● Explore the natural world around them, making observations and drawing pictures of animals and plants; ● Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; ● Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
Blossom Y1	
Willow Y2, Y3	● To know that different kinds of rocks are grouped together on the basis of their appearance and simple physical properties ● Describe in simple terms how fossils are formed when things that have lived are trapped within rock ● To know and recognise that soils are made from rocks and organic matter.
Oak Y4, Y5, Y6	

The Earth (Including Seasonal Changes) – Progression in Knowledge

For a child to have met expectations, they will have developed the following knowledge by the end of their time in each class.

Class	Knowledge
Blossom (EYFS)	**Early Learning Goal: The Natural World** Children at the expected level of development will: ● Explore the natural world around them, making observations and drawing pictures of animals and plants; ● Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; ● Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
Blossom Y1	● To know the weather associated with the four seasons and how day length varies
Willow Y2, Y3	
Oak Y4, Y5, Y6	● To know that the sun is a star at the centre of our solar system and that is has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet in 2006) that orbit it. ● To know the movement of the Earth, and other planets, relative to the Sun in the ● solar system ● To know the movement of the Moon relative to the Earth ● To know that the Sun, Earth and Moon are approximately spherical bodies

Evolution and Inheritance – Progression in Knowledge

For a child to have met expectations, they will have developed the following knowledge by the end of their time in each class.

Class	Knowledge
Blossom (EYFS)	**Early Learning Goal: The Natural World** Children at the expected level of development will: ● Explore the natural world around them, making observations and drawing pictures of animals and plants; ● Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; ● Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
Blossom Y1	
Willow Y2, Y3	
Oak Y4, Y5, Y6	● To know and recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago ● To know and recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents ● To know how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution

Progression in Working Scientifically

Our rolling curriculum means that children will be introduced to science topics outside of their national curriculum year. Whilst the knowledge remains the same, our expectation is that the scientific skills of asking questions, gathering data and suggesting answers will broadly align with childrens key stage.

The tables below have been adapted from ASE.

Asking Questions – Progression in Skills

Key Stage	Skills developed
ELG	Children at the expected level of development will: ● Explore the natural world around them, making observations and drawing pictures of animals and plants; ● Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; ● Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
KS1	● While exploring the world, the children develop their ability to ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen). Where appropriate, they answer these questions. ● The children answer questions developed with the teacher often through a scenario. ● The children are involved in planning how to use resources provided to answer the questions using different types of enquiry, helping them to recognise that there are different ways in which questions can be answered.
LKS2	● The children consider their prior knowledge when asking questions. They independently use a range of question stems. Where appropriate, they answer these questions. ● The children answer questions posed by the teacher. ● Given a range of resources, the children decide for themselves how to gather evidence to answer the question. They recognise when secondary sources can be used to answer questions that cannot be answered through practical work. They identify the type of enquiry that they have chosen to answer their question.
UKS2	● Children independently ask scientific questions. This may be stimulated by a scientific experience or involve asking further questions based on their developed understanding following an enquiry. ● Given a wide range of resources the children decide for themselves how to gather evidence to answer a scientific question. They choose a type of enquiry to carry out and justify their choice. They recognise how secondary sources can be used to answer questions that cannot be answered through practical work.

Key Stage	Skills developed
	● The children select from a range of practical resources to gather evidence to answer their questions. They carry out fair tests, recognising and controlling variables. They decide what observations or measurements to make over time and for how long. They look for patterns and relationships using a suitable sample.

Gathering Data – Progression in Skills

Key Stage	Skills developed
ELG	Children at the expected level of development will: ● Explore the natural world around them, making observations and drawing pictures of animals and plants; ● Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; ● Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
KS1	● Observe closely using simple tests o Children explore the world around them. They make careful observations to support identification, comparison and noticing change. They use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations. o They begin to take measurements, initially by comparisons, then using non-standard units. ● Perform simple tests o The children use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. They carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time. ● Identify and classify o Children use their observations and testing to compare objects, materials and living things. They sort and group these things, identifying their own criteria for sorting. o They use simple secondary sources (such as identification sheets) to name living things. They describe the characteristics they used to identify a living thing. ● Gather and record data to help in answering questions o The children record their observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. o They record their measurements e.g. using prepared tables, pictograms, tally charts and block graphs. o They classify using simple prepared tables and sorting rings.
LKS2	● Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers o The children make systematic and careful observations.

Key Stage	Skills developed
	○ They use a range of equipment for measuring length, time, temperature and capacity. They use standard units for their measurements. ● Setting up simple practical enquiries, comparative and fair tests ○ The children select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher. ○ They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking. ● 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 ○ The children sometimes decide how to record and present evidence. They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). They record classifications e.g. using tables, Venn diagrams, Carroll diagrams. ○ Children are supported to present the same data in different ways in order to help with answering the question.
UKS2	● Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate ○ The children select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale. ○ During an enquiry, they make decisions e.g. whether they need to: take repeat readings (fair testing); increase the sample size (pattern seeking); adjust the observation period and frequency (observing over time); or check further secondary sources (researching); in order to get accurate data (closer to the true value). ● Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs ○ The children decide how to record and present evidence. They record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. They record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. They record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys. ○ Children present the same data in different ways in order to help with answering the question.

Suggesting Answers – Progression in Skills

Key Stage	Skills developed
ELG	Children at the expected level of development will: ● Explore the natural world around them, making observations and drawing pictures of animals and plants; ● Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class;

Key Stage	Skills developed
	● Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
KS1	● Children use their experiences of the world around them to suggest appropriate answers to questions. They are supported to relate these to their evidence e.g. observations they have made, measurements they have taken or information they have gained from secondary sources. ● The children recognise 'biggest and smallest, 'best and worst etc. from their data.
LKS2	● Using straightforward scientific evidence to answer questions or to support their findings o Children answer their own and others questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. The answers are consistent with the evidence. ● Identifying differences, similarities or changes related to simple scientific ideas and processes o Children interpret their data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns and causal relationships. ● Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions o They draw conclusions based on their evidence and current subject knowledge. o They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry. o Children use their evidence to suggest values for different items tested using the same method e.g. the distance travelled by a car on an additional surface. o Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry. ● Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions o They communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary.
UKS2	● Identifying scientific evidence that has been used to support or refute ideas or arguments o Children answer their own and others questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. When doing this, they discuss whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes their answer. o They talk about how their scientific ideas change due to new evidence that they have gathered. o They talk about how new discoveries change scientific understanding. ● Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations o In their conclusions, children: identify causal relationships and patterns in the natural world from their evidence; identify results that do not fit the overall pattern; and explain their findings using their subject knowledge. o They evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources used. o They identify any limitations that reduce the trust they have in their data. o They communicate their findings to an audience using relevant scientific language and illustrations.

Key Stage	Skills developed
	● Children use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests.