Glenhurst Drive, Whickham, Newcastle Upon Tyne, NE16 5SJ
0191 433 4056 www.cloverhillprimary.org
cloverhillprimary@gateshead.gov.uk

CLOVER HILL PRIMARY SCHOOL

Headteacher: Mrs Ailsa Holden

Science Policy

Subject Overview

The 3 key drivers for our curriculum at Clover Hill are fully integrated within our science curriculum.

Long-term learning	Skills specific to each key stage are revisited during each topic to give children the opportunity to develop their expertise and then practise and enjoy using these skills competently. Children build up a familiarity with the key scientific vocabulary associated with these skills which leads to confident and capable scientists.
Co-operative Learning	Co-operative learning in Science promotes curiosity and teamwork during practical investigations. Children share observations, compare results, and discuss hypotheses, which deepens scientific understanding. Group work encourages critical thinking and ensures all pupils contribute ideas, fostering a sense of ownership and engagement in the learning process.
Real-life Relevance	Science is everywhere in our lives, enhancing and providing answers wherever we look. Children need to see the relevance of our work in the classroom to the life outside. How the lesson they are taking part in affects our own life is made explicit and the key messages reinforced through discussion and debate. Year groups try wherever they can to investigate the work of 'real scientists' and how their work has impacted on the topics being studied. Children need to see that science offers an abundance of exciting and vocational employment opportunities too and that aspiring youngsters have the chance to work within the subject in later life.

INTRODUCTION – WHAT IS PRIMARY SCIENCE?

Primary Science is the understanding of scientific ideas through first-hand experience. It must provide the means for children to explore, discover and investigate the world around them and to make these experiences as broad and varied as possible.

"Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes." Science Curriculum 2014 – purpose of study

Science involves the key processes of:

- Observing
- Predicting
- Investigating
- Reviewing & Evaluating

The New Science Curriculum for 2014 encourages the development of a scientific approach to learning, using AT1 elements of science across topics and everyday science lessons. "'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group. It should not be taught as a separate strand."

Children need to:

1. Raise questions from their own observations.

2. Investigate and find a fair way of testing their own hypotheses and predictions, which arise from these questions.
3. Devise accurate ways of recording what happens in these tests.
4. Learn how to review, evaluate and share their ideas with others.

Science can develop:

- Children's knowledge of their world
- Their concept of what things are like
- Their knowledge of how things can be classified
- Their understanding of how things change, behave and affect each other
- Their skills, which enable them to know how to explore, observe, experiment, make and test predictions

We constantly modify and rethink concepts in the light of new experience.
Science can encourage a questioning attitude, one that continually asks "WHY?"
Primary science should build on a child's present knowledge and past experiences.
Primary science should build on a child's natural curiosity about the world around him/her.

PRIMARY SCIENCE – BASIC PRINCIPLES OF LEARNING

On entering school, a child's experiences are mainly of home and family, and these must act as our starting points, but as a child progresses through the 2 Key Stages there must be opportunities to experience diverse and wider environments and areas of learning. Most of these will be revisited to ensure learning to greater depth and breadth of understanding.

Science should be developed in accordance with the child's rate of learning. Good Science should be designed to give progressively deeper understanding, knowledge and skills.

Teachers should recognise that there will be different levels of ability and experience within one class and that tasks set of themes undertaken may have to be modified to account for this.

Scientific enquiry is a practical subject and should be fun for both children and teachers. Equal opportunities will ensure Science is for all pupils. All Science will be taught within the guidelines of the school's Equal Opportunities policy.

"Any subject can be taught to any child at almost any age, in some form, which is true and useful"
- Bruner

AIMS AND OBJECTIVES

Skills, concepts and attitudes are built up through the course of a person's lifetime.

The Primary Science Curriculum should reflect this, giving children opportunities to develop and extend their understanding of the complex world they live in.

Our overall aim should be the development of adaptable, perceptive and confident children who can grasp a range of ideas and absorb information. We should imbue children with a well-balanced attitude towards other people and to the quality of the environment in which they live and for which they have responsibility.

Our aim is to give practical experiences in the children's own environment so that in learning by doing, the children relate their own experiences to the world around them. We shall promote learning through a wide variety of teaching and learning styles.

We should involve children in real problems so that they can use their skills to apply knowledge to their environment with real understanding of it, their place in it, and its rapidly changing technology.

GENERAL APPROACH

The National Curriculum provides us with guidelines that must be followed with the aim of increasing the children's knowledge and understanding of the scientific world through a process of enquiry that can be developed across the curriculum.

We must ensure the provision of resources and opportunities for each child to achieve the highest levels possible in the development of his/her scientific knowledge, understanding and skills.

In the National Curriculum for Primary Schools (1988 Education Reform Act) it is recommended that children learn through activities which span the range of subject areas provided in a balanced and broadly based curriculum which "promotes the spiritual, moral, cultural, mental and physical development of pupils at school and of society" and "prepares pupils for opportunities, responsibilities and experiences of adult life."

Under Section 4 of the act, it is imperative that any science policy covers all the programmes of study and attainment targets set out and that schemes must reflect this and be adjusted accordingly.

The National Curriculum specifies the content of the Science curriculum, and the assessment of the children is based on this.

The programmes of study set out what pupils should be taught in science and provide the basis for planning schemes of work. When planning, schools should also consider the general teaching requirements for inclusion, use of language, use of I.C.T., health and safety and personal development of pupils that apply across the programmes of study.

The Knowledge, Skills and Understanding in each programme of study identify the four areas of science that pupils study: -

- Sc. 1 Scientific Enquiry
- Sc. 2 Life Processes and Living Things
- Sc. 3 Materials and their Properties
- Sc. 4 Physical Processes

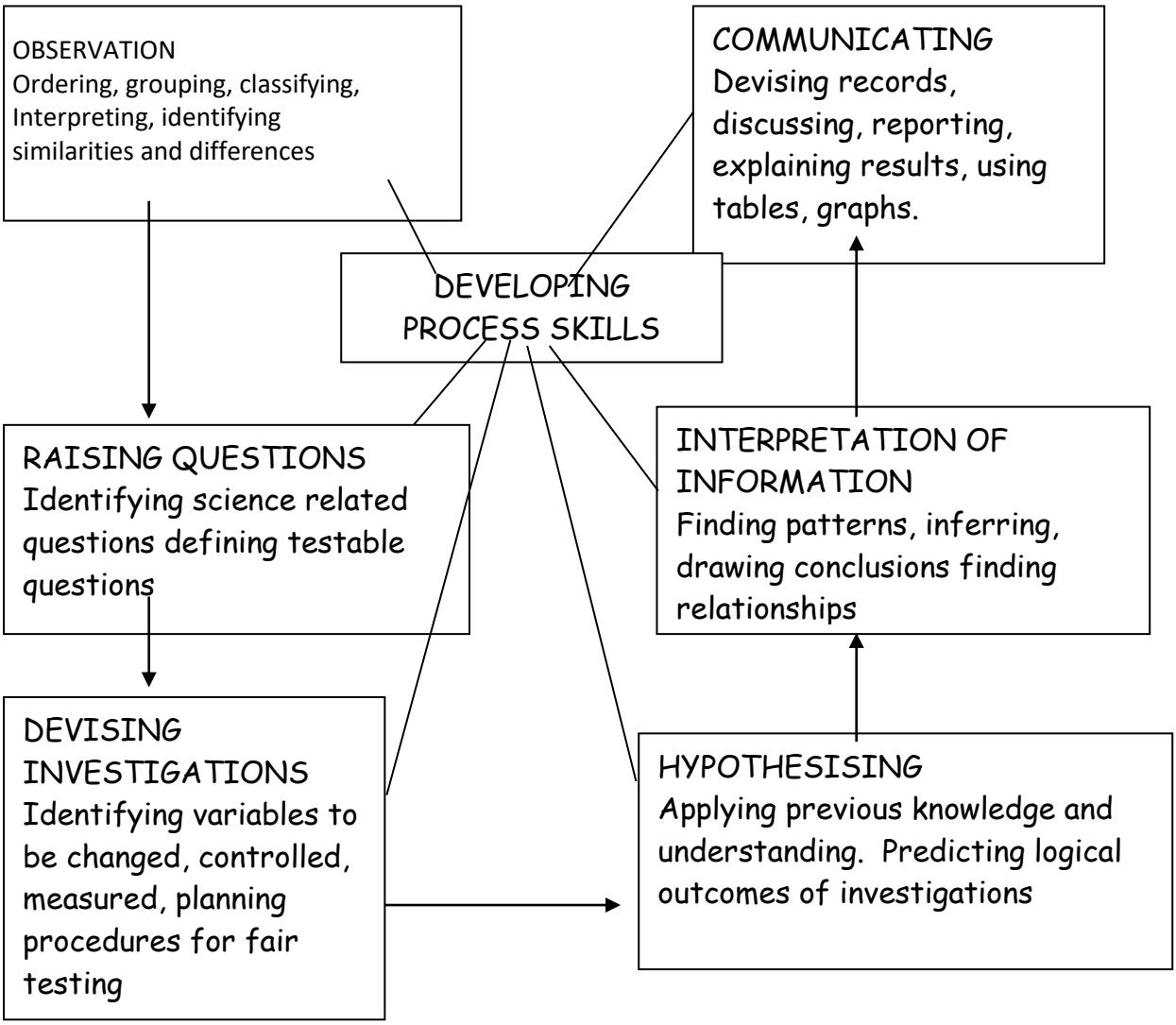
The Breadth of Study identifies contexts in which science should be taught, makes clear that technological applications should be studied, and identifies what should be taught about communication and health and safety in science. The breadth of study is set out in the National Curriculum 2014 and is found on the Science Curriculum map.

AIMS

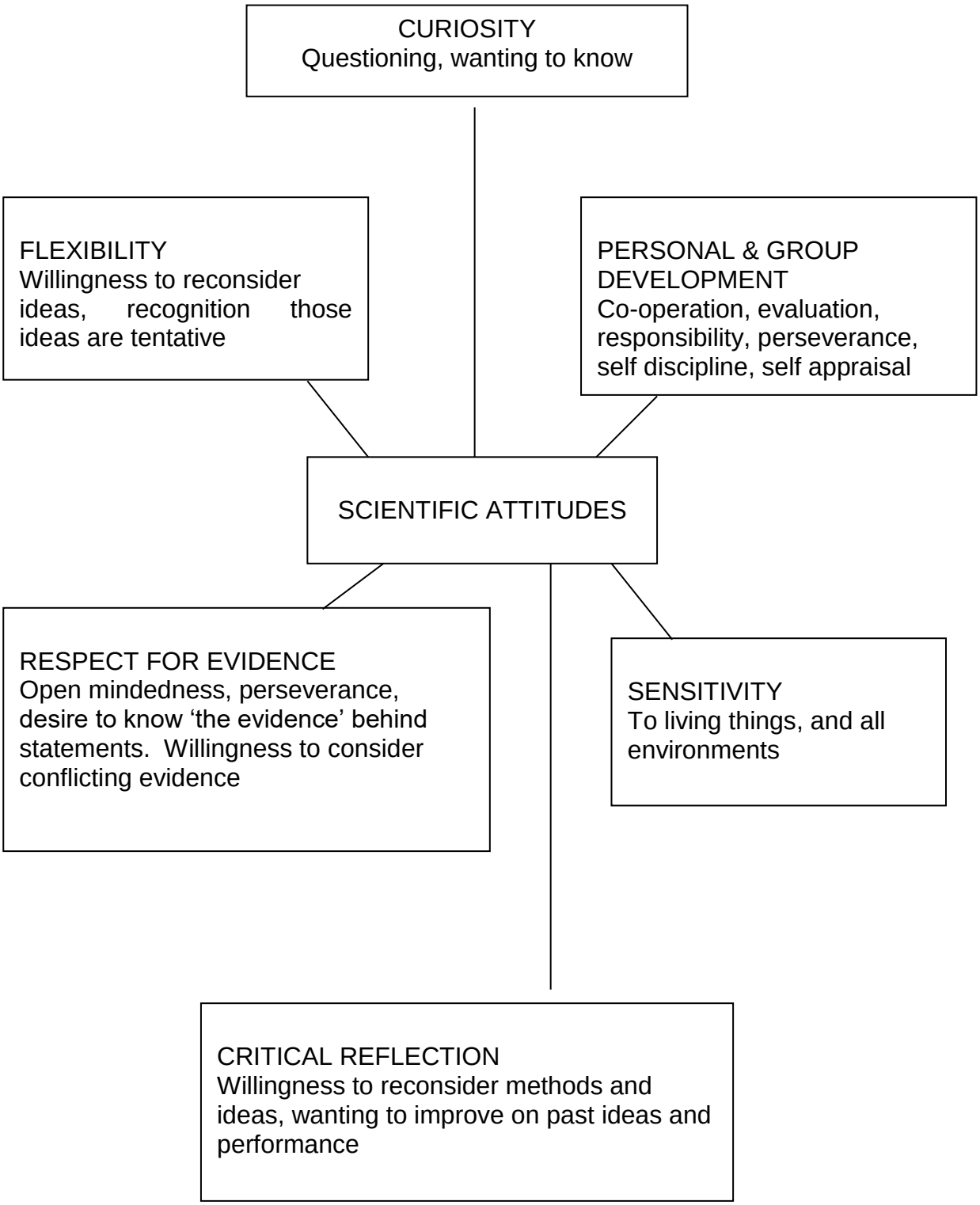
SKILLS AND ATTITUDES

It is our aim at Clover Hill, to develop science skills and to foster inquiring attitudes in science, which is the essence of A.T.1. Scientific Enquiry in the National Curriculum. Specific skills to be covered are carefully planned for during each lesson and these skills are shared and discussed with pupils. Lists of skills for each year group are stuck into pupils' science books for constant reference.

The two diagrams that follow enlarge on these important factors.



ATTITUDES and their development are equally important and need to be fostered and developed alongside skills.



ASSESSMENT

We assess children continually by observation, discussions and by evaluation of recorded work.

Pupil progress is evaluated at the end of every unit with the aid of Grammarsaurus assessment materials. The acquisition of skills and knowledge is considered along with any notes on planning and teaching which informs future learning. Teachers identify more able children, working with greater depth, children working at expected standards and those working towards their year group's expectations.

Standards in science are reported at year 2 and 6 using a Teacher Assessment Framework.

HEALTH AND SAFETY

During the planning process, teachers consider and minimise risks for all activities and systematically teach pupils to take responsibility for determining the risks to themselves and others.

RESOURCES

The provision of adequate resources must be achieved if teachers are to put into practice the school's policy.

The policy itself is based on the development of a set of scientific skills which cater for progression through a child's years in primary school, and to fulfil the criteria of aspiring to cover the levels set out in the Attainment Targets of the National Curriculum.

In the main our science resources have been centralised in the storage units in the Studio.

Central Resource Areas

It is intended that all larger apparatus, and apparatus used on a short-term topic length basis, is borrowed from and returned to the Studio.

Also, that smaller apparatus and consumable items be stored here for staff to help themselves, as needed, in order to resource their regularly used classroom science resources. The consumable items are then restocked on the shelves as required. This is done by the subject leader on a yearly basis and when any additional need arises.

Some of the science equipment needed is also relevant to Maths and Technology and can therefore be found elsewhere in the K.S. 1 and K.S.2 classroom storage areas.

Science Curriculum Map			
	Autumn Term	Spring Term	Summer Term
Year 1	Seasonal Changes Everyday Materials	Seasonal Changes Animals Including Humans	Seasonal Changes Plants
Year 2	Uses of Everyday Materials	Animals Including Humans	Living Things and their Habitats Plants
Year 3	Animals Including Humans Forces and Magnets	Rocks Light	Plants
Year 4	Animals Including Humans Sound	States of Matter Electricity	Living things and their habitats
Year 5	Properties and Changes of Materials Forces	Earth And Space Living Things and their Habitats	Animals Including Humans
Year 6	Evolution and Inheritance Light	Electricity	Living Things and Their Habitats Animals Including Humans

Science end of unit evaluations

Year 1	Science Assessment	Autumn
Statutory Requirements		
Seasonal Changes	♣ Observe changes across the four seasons. ♣ Observe and describe weather associated with the seasons and how day length varies.	
Below ARE:		Future Support:
Plants	♣ Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.	
Below ARE:		Future Support:
Everyday Materials	♣ Distinguish between an object and the material from which it is made. ♣ Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. ♣ Describe 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.	
Below ARE:		Future Support:

Year 1	Science Assessment	Spring
Animals including Humans	♣ Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals ♣ Identify and name a variety of common animals that are carnivores, herbivores and omnivores ♣ Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets.	
Below ARE:		Future Support:
Seasonal Changes: Winter and Spring	♣ Observe changes across the four seasons ♣ Observe and describe weather associated with the seasons and how day length varies	
Year 1	**Science Assessment**	**Spring**

Plants	♣ 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, including trees
Animals including Humans	♣ Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals
Seasonal Changes: Summer	♣ Observe changes across the four seasons ♣ Observe and describe weather associated with the seasons and how day length varies

Below ARE:	Future Support:

Working Scientifically

	Autumn	Spring	Summer
♣ Asking simple questions and recognising that they can be answered in different ways.			
♣ Observing closely, using simple equipment.			
♣ Performing simple tests.			
♣ Identifying and classifying.			
♣ Gathering and recording data to help in answering questions.			
Children working below ARE			
Future Support:			

Year 2	Science Assessment	Autumn

Statutory Requirements

Uses of Everyday Materials	♣ Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. ♣ Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Below ARE:	Future Support:

Living Things and Their Habitats	♣To observe and record seasonal changes and how they affect the lives of animals and humans (ongoing across the year)

Below ARE:	Future Support:

Year 2	Science Assessment	Spring

Animals including Humans	♣ Notice that animals, including humans, have offspring which grow into adults. ♣ Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) ♣ Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Below ARE:	Future Support:

• Year 2	Science Assessment	Summer

Living Things and their Habitats	♣ Explore and compare the differences between things that are living, dead, and things that have never been alive. ♣ Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. ♣ Identify and name a variety of plants and animals in their habitats, including microhabitats. ♣ 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.

Below ARE:	Future Support:

Plants	♣ 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.

Below ARE:	Future Support:

Working Scientifically

	Autumn	Spring	Summer
♣ Asking simple questions and recognising that they can be answered in different ways.			
♣ Observing closely, using simple equipment.			
♣ Performing simple tests.			
♣ Identifying and classifying.			
♣ Gathering and recording data to help in answering questions.			

Children working below ARE			
Future Support:			

Year 3	Science Assessment	Autumn

Statutory Requirements

Animals including Humans	♣ Identify 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. ♣ Identify that humans and some other animals have skeletons and muscles for support, protection and movement.

Below ARE:	Future Support:

Forces and Magnets	♣ 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. ♣ Describe magnets as having two poles. ♣ Predict whether two magnets will attract or repel each other, depending on which poles are facing.

Below ARE:	Future Support:

Year 3	Science Assessment	Spring

Rocks	♣ compare and group together different kinds of rocks 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. ♣ recognise that soils are made from rocks and organic matter.

Below ARE:	Future Support:

• Year 3	Science Assessment	Summer

Light	♣ Recognise that they need light in order to see things and that dark is the absence of light. ♣ Notice that light is reflected from surfaces. ♣ Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. ♣ Recognise that shadows are formed when the light from a light source is blocked by an opaque object. ♣ Find patterns in the way that the size of shadows change.

Below ARE:	Future Support:

Plants	♣ 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.

Below ARE:	Future Support:

Working Scientifically

	Autumn	Spring	Summer
♣ Asking relevant questions and using different types of scientific enquiries to answer them.			
♣ Setting up simple practical enquiries, comparative and fair tests.			

♣ Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.			
♣ 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.			
♣ Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.			
♣ Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.			
♣ Identifying differences, similarities or changes related to simple scientific ideas and processes.			
♣ Using straightforward scientific evidence to answer questions or to support their findings.			
Children working below ARE			
Future Support:			

Year 4	Science Assessment	Autumn

Statutory Requirements

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. ♣ Construct and interpret a variety of food chains, identifying producers, predators and prey.

Below ARE:	Future Support:
Chn to support/monitor – Zoey /Indie / Lola SEN – Olivia W - needs scaffolding & support to complete tasks Concentration /On task – George / James/ Jackson /Thomas/ Oliver /Daniel / Noku	Food chains need to be simple and animals clear to understand

Sound	♣ Identify how sounds are made, associating some of them with something vibrating. ♣ Recognise that vibrations from sounds travel through a medium to the ear. ♣ 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. ♣ Recognise that sounds get fainter as the distance from the sound source increases.

Below ARE:	Future Support:

Year 4	Science Assessment	Spring

Electricity	♣ Identify common appliances that run on electricity ♣ Construct 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 ♣ Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit ♣ Recognise some common conductors and insulators, and associate metals with being good conductors

Below ARE:	Future Support:

• Year 4	Science Assessment	Summer

Living Things and Their Habitats	♣ Recognise that living things can be grouped 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. ♣ Recognise that environments can change and that this can sometimes pose dangers to living things.

Below ARE:	Future Support:

States of Matter	♣ 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) ♣ Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature

Below ARE:	Future Support:

Working Scientifically

	Autumn	Spring	Summer
♣ Asking relevant questions and using different types of scientific enquiries to answer them.			
♣ Setting up simple practical enquiries, comparative and fair tests.			

♣ Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.			
♣ 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.			
♣ Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.			
♣ Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.			
♣ Identifying differences, similarities or changes related to simple scientific ideas and processes.			
♣ Using straightforward scientific evidence to answer questions or to support their findings.			
Children working below ARE:			
Future Support:			

Year 5	Science Assessment	Autumn

Statutory Requirements

Forces	♣ 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.

Below ARE:	Future Support:

Properties and Changes of Materials	♣ 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. ♣ Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. ♣ 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. ♣ 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.

Below ARE:	Future Support:

Year 5	Science Assessment	Spring

Earth and Space	♣ Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. ♣ Describe the movement of the Moon relative to the Earth. ♣ Describe the Sun, Earth and Moon as approximately spherical bodies. ♣ Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

Below ARE:	Future Support:

• Year 5	Science Assessment	Summer

Living Things and Their Habitats	♣ Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. ♣ Describe the life process of reproduction in some plants and animals.

Below ARE:	Future Support:

Animals Including Humans	♣ Describe the changes as humans develop to old age.

Below ARE:	Future Support:

Working Scientifically			
	Autumn	Spring	Summer
• Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.			
♣ Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.			
♣ Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.			
♣ Using test results to make predictions to set up further comparative and fair tests.			
♣ 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			
Children working below ARE			
Future Support:			

Year 6	Science Assessment	Autumn

Statutory Requirements

Evolution and Inheritance	♣ 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

Below ARE:	Future Support:

Light	♣ Recognise that light appears to travel in straight lines ♣ 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 ♣ Explain 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 why shadows have the same shape as the objects that cast them

Below ARE:	Future Support:

Year 6	Science Assessment	Spring

Electricity	♣ Use recognised symbols when representing a simple circuit in a diagram. ♣ Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. ♣ 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.

Below ARE:	Future Support:

• Year 6	Science Assessment	Summer

Living Things and Their Habitats	• Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. ♣ Give reasons for classifying plants and animals based on specific characteristics.

Below ARE:	Future Support:

Animals Including Humans	♣ Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. ♣ Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. ♣ Describe the ways in which nutrients and water are transported within animals, including humans.

Below ARE:	Future Support:

Working Scientifically			
	Autumn	Spring	Summer
• Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.			
♣ Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.			
♣ Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.			
♣ Using test results to make predictions to set up further comparative and fair tests.			
♣ 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			
Children working below ARE			
Future Support:			