Attleborough Primary Curriculum Intent for Science

Science is present in most aspects of modern life. We believe an understanding of its nature and the acquisition of relevant scientific knowledge will help our children to flourish and benefit them as we prepare them for their future lives. The school believes that it should provide a context where children are inspired and can develop a knowledge and understanding of science as a means of exploring and discovering their environment, whilst achieving the requirements of the National Curriculum.

In order to achieve this we also hope to foster attitudes of confidence, respect, co-operation, flexibility, perseverance, independence and an enjoyment of science.

Through the teaching of Science, we aim to:

- Nurture and develop pupils' interest, enjoyment and enthusiasm in Science and broaden their scientific view of the world around them.
- To build on pupils' curiosity and sense of awe of the natural world and scientific phenomena.
- To encourage pupils to ask and answer scientific questions using investigations, computing skills and secondary sources.
- To use a range of investigations and practical activities to give pupils a greater understanding and depth of the concepts and knowledge of science.
- Develop the children's ability to plan and carry out fair scientific investigations, selecting the most appropriate ways to answer questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests using a range of suitable equipment correctly.
- To encourage children to evaluate evidence based on their data and observations, using this to justify their ideas, and use their scientific knowledge and understanding to explain their findings and present their conclusions clearly and accurately.
- To teach pupils to make informed decisions based on evidence and their own experiences and be able to apply scientific knowledge to new situations.
- To introduce pupils to the language and vocabulary of Science.
- To promote a "healthy lifestyle" in our pupils.
- Develop the pupils' knowledge and understanding of their own health and safety and respect for the environment.

Development Matters for 3 – 4 Year Olds EYFS Statutory Framework Science Related Objectives
Development Matters for 3 – 4 Year Olds **Communication and Language** • Understand 'why' questions, like: "Why do you think the caterpillar got so fat?" **Personal, Social and Emotional Development** • Make healthy choices about food, drink, activity and toothbrushing. **Understanding the World** • 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. • Begin to make sense of their own life-story and family's history. • Explore how things work. • Plant seeds and care for growing plants. • 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. • Explore and talk about different forces they can feel. • Talk about the differences between materials and changes they notice. **Communication and Language** • Learn new vocabulary. • Ask questions to find out more and to check what has been said to them. • Articulate their ideas and thoughts in well-formed sentences. • Describe events in some detail. • Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen. • Use new vocabulary in different contexts. **Personal, Social and Emotional Development** • Know and talk about the different factors that support their overall health and wellbeing: - regular physical activity - healthy eating - toothbrushing - sensible amounts of 'screen time' - having a good sleep routine - being a safe pedestrian

Understanding the World

- Explore the natural world around them.
- Describe what they see, hear and feel while they are 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.

EYFS Statutory Framework

Listening, Attention and Understanding

- Make comments about what they have heard and ask questions to clarify their understanding.

Managing Self

- Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.

The Natural World

- 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.

RECEPTION Key content knowledge.

Autumn		Spring		Summer	
All About Me and My Special Powers Key Question: What special powers do I have? • We can find natural resources in our EYFS garden/outside area. • We can group materials we find in our EYFS garden/outside area • We know that we have five senses.	The Big Freeze Key Question: What things can I see change? • Can name and explore their 5 senses, explaining in simple terms what their 5 senses are. • Understand some important processes and changes in the natural world around them, including the seasons and	Attleborough and The World Around Us Key Question: Where do I live? • Know that there are different countries in the world and talk about differences they have experienced or seen in photos. New Year Celebrations around the world.	Healthy Body – Healthy Me! Key Question: How can I stay healthy? • Walking for fitness and importance of exercise/daily mile. • Explain the importance of looking after our bodies and minds and what they can do to keep themselves healthy.	Amazing Animals and Their Habitats Key Question: Where do animals live? • Look at different habitats • Look at the difference between animals that live on land or water. • What is a life cycle? • Explore the lifecycle of a butterfly. What does the caterpillar	Traditional Tales (Kings and Queens) Key Question: How do plants grow? • Understand some important processes and changes in the natural world around them, focussing on changes in the environment. • World Environment Day and World Ocean Day.

• We can use one of our senses to identify / group objects. • We can use one of our senses to identify / group objects. • We can notice the changing season. • We know how we can care for the natural world.	changing states of matter (freezing, melting, floating/sinking) • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter (freezing, melting, floating/sinking) • Make a stick man – what type of sticks are the best? • Christmas Trees – • Trees and Seasons.	• Encourage interactions with the outdoors to foster curiosity and give children freedom to touch, smell and hear the natural world around them during hands-on experiences. • Children make comments on the weather, culture, clothing, housing. • Environments – Features of local environment Maps of local area comparing places on Google Earth – how are they similar/ different? • Walk around town – what do we have in our local community? Link to Handa's surprise. How is the environment in the story different to ours? • Introduce the children to recycling	• Healthy Eating – the importance of looking after our bodies and minds and what they can do to keep themselves healthy. • Looking after our bodies (teeth, washing etc) • Looking for signs of spring	need to grow into a butterfly? • Class Caterpillars • Explore the lifecycle of a frog. • Learn their names and label their body parts. • Nocturnal Animals • What marvellous minibeasts may we find in our gardens? Identify and look for common features. What do they bring to our gardens? Focus: Children choose minibeast to learn about. • After close observation, draw pictures of the natural world, including animals and plants.	• Explore different plants and the lifecycle of a bean. • Linked to Jack and The Beanstalk. Create a bean diary for their bean plant. • Observe changes. • Observe changes in bean plant.

		and how it can take care of our world. • How can we look after our environment. • Explore the world around us and see how it changes as we enter Spring. • Provide opportunities for children to note and record the weather.			
Key Vocabulary All children to know the meaning of these words by the end of the unit					
Materials Object recycling. Properties Waterproof strong/weak, hard/soft. Bubble wrap, foil, plastic, fabric, paper, straw, sticks, bricks, metal, glass purpose	Senses Taste Smell Touch See Hear Melt Freeze Hot Cold	Seasons: - Spring (growth, baby animals) - Summer - Autumn (Harvest) - Winter Weather: - Sun, rain, wind, snow, ice, frost, sleet, hail. - Cold/warm/hot Day length, day light.	Healthy Exercise Food Safe Clothes Toilet Similar Different	Body parts. Backbone, skeleton, shell. hibernate, migrate. Lifecycle: Egg, caterpillar, chrysalis, butterfly. Birds (owl, duck), insects/bugs/minibeasts fish, reptiles amphibians, mammals habitat	Living things – plants Grow Roots Shoots stem leaves, buds flower Water Light warmth, temperature soil, compost
Enrichment Opportunities Trips / visitors/ WOW moments					
Exploring the outdoor area		Tractor Visit, Dentist, Vet and Paramedic visitors British Science Week – LIVE Lesson		World Environment Day and World Ocean Day. Growing plants	

Key Stage 1 National Curriculum Objectives

Working Scientifically

- asking simple questions and recognising that they can be answered in different ways
- observing closely, using simple equipment
- performing simple tests
- identifying and classifying
- using their observations and ideas to suggest answers to questions
- gathering and recording data to help in answering questions

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
- 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)
- identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense

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

Seasonal changes

- observe changes across the four seasons
- observe and describe weather associated with the seasons and how day length varies

Year 1 Key content knowledge.					
Autumn Term		Spring Term		Summer Term	
Unit: Plants Key Question: What do plants need to grow? • Identify and name common garden and wild plants. • Identify some trees by their leaves. • Identify and describe parts of plants and trees. • Say what plants need to grow well. Scientist: Tim Smit	Unit: Seasonal Changes Key Question: What changes with the season? • Find out about different seasons and how to describe them. • Find out about the season and how they are different. • Find out about how animals and humans are affected by the seasons. • Find out about the day length is affected by the seasons. • Investigate the weather during the seasons. Scientist: Christopher Wren and Robert Hooke	Unit: Animals Key Question: Do animals eat the same food? • Understand that animals have different diets. • Understand the difference between carnivores, omnivores and herbivores. • Understand that animals have different diets. • Identify and classify animals by saying what group they belong to. Scientist: Carl Hagenbeck	Unit: Animals Key Question: What type of animal is it? • To identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. • To name animal body parts and say what are similar and different. • To identify and sort carnivores, herbivores and omnivores. • To take care of animals. Scientist: Carl Hagenbeck	Unit: Animals including Humans Key Question: How do my senses help me? • To identify, name and label body parts. • To explore what parts of our bodies we use for different activities. • To find out about the five senses. Scientist: Linda Brown Buck	Unit: Everyday Materials Key Question: What is it made from and why? • Look at objects and name the material it is made from. • Describe the properties of everyday materials. • Perform a simple test using everyday materials and use observations to answer a question. Scientist: Ole Kirk Christiansen

Working Scientifically Skills					
• Identify and classify • Asking simple questions and recognise that they can be answered in different ways • Observe closely, using simple equipment • Using their observations and ideas to suggest answers to questions • Gather and record data to help in answering questions	• Perform simple tests • Identify and classify • Using their observations and ideas to suggest answers to questions • Gather and record data to help in answering questions	• Perform simple tests • Identify and classify • Using their observations and ideas to suggest answers to questions • Gather and record data to help in answering questions	• Perform simple tests • Identify and classify • Using their observations and ideas to suggest answers to questions • Gather and record data to help in answering questions	• Identify and classify • Asking simple questions and recognise that they can be answered in different ways • Using their observations and ideas to suggest answers to questions • Gather and record data to help in answering questions	• Perform simple tests • Identify and classify • Using their observations and ideas to suggest answers to questions • Gather and record data to help in answering questions
Key Vocabulary All children to know the meaning of these words by the end of the unit					
Wild plants Garden plants Deciduous, Evergreen Tree Trunk Branches Leaf Leaves Root Flower Petals Stem seed	<u>season</u> summer winter autumn spring day/daytime <u>weather</u> wind, rain, snow, hail, sleet, fog, sun hot warm cold	Carnivores Meat Herbivores Plants Omnivores	Common animals Fish Amphibians Reptiles Birds Mammals Pets	Body parts Senses Hear See Smell Touch Taste	<u>Material</u> Wood, plastic, glass, metal, water, brick, paper, fabric, elastic, foil, rock <u>Properties</u> Hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy, brittle, waterproof, absorbent
Enrichment Opportunities Trips / visitors/ WOW moments					
Vegetable garden		Trip to Africa Alive British Science Week – LIVE Lesson		Trip to Lowestoft Beach	

YEAR 2
Key Stage 1 National Curriculum Objectives

Working Scientifically

- asking simple questions and recognising that they can be answered in different ways
- observing closely, using simple equipment
- performing simple tests
- identifying and classifying
- using their observations and ideas to suggest answers to questions
- gathering and recording data to help in answering questions

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 micro-habitats
- 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.

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.

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.

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.

Year 2 Key content knowledge.					
Autumn Term		Spring Term		Summer Term	
Unit: Everyday Materials Key Question: How can materials be useful? • Identify and describe different materials. • to identify a variety of everyday items and the material from which it is made. • Identify different uses of everyday materials. • investigate the properties of different materials. • Record their observations.	Unit: Everyday Materials Key Question: What can you recycle? • identify the best material to protect an egg from breaking when dropped. • Demonstrate and explain how shapes of objects made from some materials can be changed. • Explain what recycling means Scientist: Charles Macintosh	Unit: Animals Including Humans Key Question: Do we all grow the same? • identify and explain the basic needs that humans need to survive. • identify the offspring of key animals. • explain how animals have babies and that they grow and change into adults. • to plan an investigation to answer a given question. • to carry out an investigation to answer a given question.	Unit: Animals Including Humans Key Question: How do you stay healthy? • explain why it is important for humans to exercise regularly. • describe a healthy diet for humans and explain the importance of eating a healthy diet. • explain how humans can have good hygiene and the importance of good hygiene. • identify things we can do to prevent illness and explain what we can do to feel better if we do become ill. Scientist: Louis Pasteur	Unit: Plants Key Question: How does a cactus survive in a desert? • suggest what they think a plant needs to grow and stay healthy. • dissect and observe a seed, explaining which parts will grow into a plant and which part is its food. • order the life cycle of a plant. • begin to explain that plants need water, light and a suitable temperature to grow and stay healthy. • identify what happens if a plant does not get everything it needs. • find out how different plants need different amounts of water and light and	Unit: Living Things and their Habitats Key Question: What is a habitat? • Say what is different about things that are living, dead or have never been alive. • Identify some of the plants and animals in a familiar habitat. • Find microhabitats. • Describe the conditions in a habitat. • Ask questions about different habitats. • Describe the characteristics of some plants and animals. • Name some sources of food. Scientist: Rachel Carson

				different temperatures to grow and stay healthy. • begin to understand how some plants are suited to their habitats. Scientist: Jane Colden	
Working Scientfically Skills					
• Perform simple tests • Using their observations and ideas to suggest answers to questions • Gather and record data to help in answering questions		• Identify and classify • Using their observations and ideas to suggest answers to questions • Gather and record data to help in answering questions		• Asking simple questions and recognise that they can be answered in different ways • Observe closely, using simple equipment • Perform simple tests • Identify and classify • Using their observations and ideas to suggest answers to questions • Gather and record data to help in answering questions	• Asking simple questions and recognise that they can be answered in different ways • Observe closely, using simple equipment • Identify and classify • Using their observations and ideas to suggest answers to questions • Gather and record data to help in answering questions

Key Vocabulary All children to know the meaning of these words by the end of the unit			
Material Wood, metal, plastic, glass, brick, rock, paper, cardboard Squashing, bending, twisting, stretching Metal Coins, cans, cars, table legs Wood Matches, floors, telegraph pole Spoon – plastic, wood, metal Rubber waterproof	Offspring Grow Adults Nutrition Reproduce Survival Water – food – air Exercise Hygiene Egg – chick – chicken Egg – caterpillar – pupa – butterfly Spawn – tadpole – frog Lamb – sheep Baby – toddler – child – teenager- adult	water light temperature grow healthy germination reproduction	Living Dead Alive Habitats Micro-habitat Food Food chain Conditions Hot – warm – cold Dry – damp – wet Bright – shade- dark
Enrichment Opportunities Trips / visitors/ WOW moments			
Visit to Tower of London Materials in the Great Fire of London	Norwich Cathedral – Edith Cavell British Science Week – LIVE Lesson	Norfolk Show – animals, agriculture, plants	

YEAR 3 Key Stage 2 National Curriculum Objectives
Working Scientifically During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • 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.

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.

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.

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.

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.

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.

Year 3

Key content knowledge.

What knowledge children will have at the end of each unit- these will also be used for assessment

Autumn Term		Spring Term		Summer Term	
Unit: Forces and magnets Key Question: Where can you find a force? • Describe pushes and pulls as a type of force. • Explain how different objects move using forces. • Describe friction as a force that slows objects down. • Compare how things move on different surfaces. • Plan and carryout a fair test.	Unit: Forces and magnets Key Question: How does a magnet work? • explore how magnetic forces act at a distance. • identify and sort a range of magnetic and non-magnetic materials. • describe magnets as having two poles- north and south and explain how opposite poles attract and the same poles repel. • describe how not all magnets have the same strength. • use results to draw simple conclusions.	Unit: Animals including Humans Key Question: What is a healthy diet? • talk about what animals and humans need to stay healthy, showing a basic understanding of healthy eating. • talk about how different animals require a different balance of nutrients and can read simple food labels. • name and briefly describe the different types of skeletons.	Unit: Plants Key Question: Why do plants have flowers? • Identify the different parts of flowering plants. • Explain what a plant needs to grow • Identify the different parts of a plant and explain their function. • Identify the main stages of the life cycle of flowering plants. Scientist: Sir Joseph Banks	Unit: Rocks Key Question: What is rock and where does it come from? • name the three different types of rocks. • handle and examine rocks to identify their properties • describe how soil is made and what it is composed of. • describe how fossils are formed Scientist: Mary Anning	Unit: Light Key Question: Why do we have a shadow? • Identify light sources. • Understand that we need light to see. • Know that light travels in a straight line. • Identify reflective surfaces. • Know that the Sun can damage their eyes. • Know how to protect their eyes from the Sun. • Understand that a shadow is formed when a solid object blocks light. Scientist: Ibn al-Haytham

	Scientist: Michael Faraday	• match labels to some parts of the human skeleton. • give a simple explanation of how muscles work. Scientist: Marie Curie			
Working Scientifically Skills					
• Set up simple practical enquiries, comparative and fair tests • Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions		• Gather, record, classify and present data in a variety of ways to help in answering questions • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Identify differences, similarities or changes related to simple scientific ideas and processes • Use straightforward scientific evidence to answer questions or to support their findings	• Ask relevant questions and using different types of scientific enquiries to answer them • Set up simple practical enquiries, comparative and fair tests • Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Gather, record, classify and present data in a variety of ways to help in answering questions • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	• Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • Identify differences, similarities or changes related to simple	• Gather, record, classify and present data in a variety of ways to help in answering questions • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Identify differences, similarities or changes related to simple scientific ideas and processes • Use straightforward scientific evidence to answer questions or to support their findings

		• Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions •Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	scientific ideas and processes • Use straightforward scientific evidence to answer questions or to support their findings	
Key Vocabulary All children to know the meaning of these words by the end of the unit				
force push pull open surface magnet magnetic attract repel magnetic poles North South	Nutrition Vitamins Minerals Fat Protein Carbohydrates Fibre Water Skeletons – support – protection Skull – brain Ribs – heart – lungs Movement Joint Muscles – move, pull, contract, relax diet	Structure Flowering plants Roots Stem Trunk Leaves Flowers Requirements for life Air light water nutrients soil grow fertiliser life cycle flower pollination seed	Appearance Physical properties Hard, soft Shiny, dull Rough, smooth Absorbent, waterproof Fossil Sedimentary rock Soil Rock Organic matter Buildings Grave stones Grains crystals	light see dark reflect surface natural star Sun Moon shadow blocked solid artificial torch candle lamp sunlight dangerous protect eyes

		formation seed dispersal		
Enrichment Opportunities Trips / visitors/ WOW moments				
	Thetford Forest – trees, animals and habitats British Science Week – LIVE Lesson		Pensthorpe Nature Reserve – plants and pollinators	

YEAR 4
Key Stage 2 National Curriculum Objectives

Working Scientifically

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- 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.

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.

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.

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

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.

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.

Year 4

Key content knowledge.

Autumn Term		Spring Term		Summer Term	
Unit: Sound Key Question: What is sound? • Describe sounds around them. • identify how sounds are made, associating some of them with something vibrating. • explain how vibrations from sounds travel	Unit: Sound Key Question: How can sound be changed? • Identify high and low sounds. • Identify loud and quiet sounds. • find patterns between the pitch of a sound and features of the object that produced it	Unit: Living Things and their Habitat Key Question: How are living things similar and different? •Sort living things into groups. • describe similarities and differences between vertebrates. • Identify vertebrate groups.	Unit: States of Matter Key Question: Where does the water go? • Sort materials into solids, liquids and gases. • Explain that heating causes melting, and cooling causes freezing. • Identify the melting and freezing point of water.	Unit: Electricity Key Question: How does a light bulb work? • define what an electrical appliance is and identify those that are mains or battery powered. • identify different circuit components and explain what they do. • build series circuits, identifying and	Unit: Animals including Humans Key Question: Why do teeth look different? • name the different types of teeth found in humans and explain their function. • explain what tooth decay is and how to look after our teeth. • describe the simple functions of the basic

through either solids, liquids or gases to the ear. • use their knowledge of particle structure to explain why sound travels more quickly through solids when compared to gases. • describe the parts and functions of the outer, middle and inner ear. • find the best material for absorbing sound.	• find patterns between the volume of a sound and the strength of the vibrations that produced it. • Describe how sounds change over distance. • Create a musical instrument that will play different sounds. Scientist: Alexander Graham Bell	• Identify the characteristics of living things. • Suggest how to have a positive effect on the local environment. • Name some endangered species. Scientist: Gerald Durrell	• Describe evaporation and condensation using practical examples. • Describe the effect of temperature on evaporation. • Identify the stages of the water cycle. Scientist: Antoine Lavoisier	explaining whether they are complete or incomplete. • explain what electrical conductors and insulators are and give several examples of these. • identify several different switches and explain how switches work in a circuit. Scientist: Thomas Edison	parts of the digestive system in humans. • construct and interpret a variety of food chains, identifying producers, predators and prey. Scientist: Washington Sheffield
Working Scientifically Skills					
• Set up simple practical enquiries, comparative and fair tests • Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	• Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers	• Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Gather, record, classify and	• Ask relevant questions and using different types of scientific enquiries to answer them • Set up simple practical enquiries, comparative and fair tests	• Set up simple practical enquiries, comparative and fair tests • Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers	

• Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Identify differences/ similarities or changes related to simple scientific ideas&processes	• Gather, record, classify and present data in a variety of ways to help in answering questions • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	present data in a variety of ways to help in answering questions • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • Identify differences, similarities or changes related to simple scientific ideas and processes • Use straightforward scientific evidence to answer questions or to support their findings	• Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Gather, record, classify and present data in a variety of ways to help in answering questions • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Use straightforward	• Gather, record, classify and present data in a variety of ways to help in answering questions • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • Identify differences, similarities or changes related to simple scientific ideas and processes

			scientific evidence to answer questions or to support their findings	
Key Vocabulary All children to know the meaning of these words by the end of the unit				
vibrate vibration air medium ear hear sound volume pitch faint fainter loud louder string percussion woodwind brass insulate	Environment Flowering Non-flowering Plants Animals Vertebrate Environment Fish Amphibians Reptiles Birds Mammals Invertebrates Plants Flowering plants Grasses Non-flowering Mosses Ferns deforestation	Solid, liquid, gas Iron, ice Melt Freeze Liquid Evaporate, evaporation Condense, condensation Changing state Heated Cooled Degrees Celsius Thermometer Water cycle Temperature Melt Warm, cool Water vapour	appliances electricity electrical circuit cell wire bulb buzzer danger electrical safety sign insulators wood, rubber, plastic, glass conductors metal water switch open closed	Human digestive system Mouth Tongue – mixes, moistens, saliva Teeth Incisors – cutting, slicing Canines – ripping, tearing Molars – chewing, grinding Oesophagus Stomach digestion Acid Enzymes Small intestine – absorbs, vitamins, water Large intestines – compacts Carnivore Herbivore
Enrichment Opportunities Trips / visitors/ WOW moments				
	How Hill – Residential			

	British Science Week – LIVE Lesson	

YEAR 5 Key Stage 2 National Curriculum Objectives
Working scientifically During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • 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 • identifying scientific evidence that has been used to support or refute ideas or arguments 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 **Animals including humans** • describe the changes as humans develop to old age **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

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

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

Year 5

Key content knowledge.

What knowledge children will have at the end of each unit- these will also be used for assessment

Autumn Term		Spring Term		Summer Term	
Unit: Earth and Space / Forces Key Question: What is in space? • name the planets in the solar system based on their distance from the Sun. • understand that the Sun is a star (not a planet) and know some facts about a chosen planet. • describe the Earth as a spherical body.	Unit: Earth and Space / Forces Key Question: Why do we have day and night? • describe the movement of the Moon in relation to the Earth • research facts about the Moon. • use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky.	Unit: Properties and Changes of materials Key Question: Does sugar disappear in water? • Identify and describe materials' properties. • Identify thermal and electrical conductors and insulators. • Identify materials that are soluble or insoluble in water. • Identify irreversible changes. • Explain dissolving.	Unit: Forces Key Question: Why do parachutes always float downwards? • identify forces as pushes and pulls. • explain gravity as a force that pulls objects down • identify Isaac Newton's discoveries. • explain the effects of friction, including air and water resistance, on moving objects.	Unit: Living Things and their Habitats Key Question: Are all life cycles the same? • Identify parts of a flower. • Describe ways plants can be pollinated. • Identify the stages in the process of sexual reproduction. • Identify different types of mammals. • Identify familiar animals that undergo metamorphosis.	Unit: Animals including humans Key Question: What happens when you get old? • explain what gestation periods are. • describe the changes as humans develop from fertilisation to birth. • explain how babies grow and develop into children. • describe and explain the main changes that occur during puberty.

• understand how it was discovered that the Earth was round and not flat by the Greek philosopher Aristotle. • describe the movement of the Earth, and other planets relative to the Sun.	• Explain that different places on Earth experience night and day at different times. • explain why the Moon appears to change shape. Scientist: Mae Carol Jemison and Margaret Hamilton	• Explain the processes used to separate mixtures. Scientist: Spencer Silver	• identify different mechanisms and explain how they work. Scientist: Isaac Newton	• Order the stages of the life cycles of mammals, birds, insects and amphibians. Scientist: David Attenborough	• describe and explain the main changes that take place in old age. • describe and explain the stages of human development. Scientist: Leonardo Da Vinci
Working Scientifically Skills					
• Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. • Use test results to make predictions to set up further comparative and fair tests. • Report and present 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. • Identify scientific evidence that has been used to support or refute ideas or arguments.	• Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. • Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking	• Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. • Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. • Report and present findings from enquiries, including conclusions,	• Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. • Report and present findings from enquiries, including conclusions, causal relationships and	• Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. • Report and present findings from enquiries, including conclusions,

	repeat readings when appropriate. • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. • Use test results to make predictions to set up further comparative and fair tests. • Report and present 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. • Identify scientific evidence that has	causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. • Identify scientific evidence that has been used to support or refute ideas or arguments.	explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. • Identify scientific evidence that has been used to support or refute ideas or arguments.	causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. • Identify scientific evidence that has been used to support or refute ideas or arguments.

	been used to support or refute ideas or arguments.			
Key Vocabulary All children to know the meaning of these words by the end of the unit				
Earth, Sun, Moon, planets stars solar system Mercury Venus Mars Jupiter Saturn Uranus Neptune Pluto rotate day, night orbit axis	Properties Hardness, solubility, transparency, conductive Electrical, thermal Magnetic, Magnetism Separate Solid, liquid, gas Filtering, sieving, evaporating Reversible changes Dissolving, mixing, melting Irreversible New material, burning, rusting chemical	gravity air resistance water resistance friction surface force effect move accelerate decelerate stop change direction	Life Cycles Mammals Amphibian Insect Bird Life process Reproduction Plants Animals Similarities differences	Human development Baby – toddler – child – teenager – adult Puberty Gestation Length Mass Grow / ing
Enrichment Opportunities Trips / visitors/ WOW moments				
	Cambridge Science Centre - Space British Science Week – LIVE Lesson			

YEAR 6 Key Stage 2 National Curriculum Objectives
Working scientifically

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- 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
- identifying scientific evidence that has been used to support or refute ideas or arguments

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 micro-organisms, plants and animals
- give reasons for classifying plants and animals based on specific characteristics

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

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

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

Electricity

- 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
- use recognised symbols when representing a simple circuit in a diagram

Year 6 Key content knowledge.					
Autumn Term		Spring Term		Summer Term	
Unit: Light Key Question: How are rainbows made? • Explain how light travels to enable us to see. • Understand that all objects reflect light. • Identify the angles of incidence and reflection. • Understand refraction as light bending or changing direction. • Explain how a prism allows us to see the visible spectrum. • Understand that colours are a result of light reflecting off an object. • Explain Isaac Newton's experiments about light and colour. • Understand how shadows change size.	Unit: Electricity Key Question: How can you make a light brighter? • explain how our understanding of electricity has changed over time. • draw circuit diagrams using the correct symbols and label the voltage correctly. • explain the effect of increasing or decreasing the voltage on different parts of a circuit. Scientist: Steve Jobs	Unit: Evolution and Inheritance Key Question: Where did humans come from? • Identify inherited traits and adaptive traits. • 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	Unit: Living Things and their Habitats Key Question: How can we sort all living things? • Describe Carl Linnaeus and his development of his classification system. • Place animals into given groups based on certain characteristics and give reasons for the classification of animals • Design a creature with a specific set of characteristics • Name types of helpful and harmful microorganisms and their characteristics. Scientist: Carl Linnaeus	Unit: Animals including Humans Key Question: Is the heart shaped like a heart? • state the three main parts of the circulatory system and describe the job of the heart. • describe the important jobs of the blood vessels and blood. • discuss how heart rate is affected by exercise. • understand that regular exercise is important for a healthy body. • discuss how diet and exercise affect the body. • discuss the impact of drugs and lifestyle on the way bodies function. Scientist: Dr Daniel Hale Williams	Unit: Transition to KS3 Key Question: What is Science like at High School.

• Understand that shadows are the same shape as the object that casts them. Scientist: Sir Isaac Newton		• Understand that adaptations are random mutations. • Examine fossil evidence supporting the idea of evolution. • recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Scientist: Charles Darwin			
Working Scientifically Skills					
• Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	• Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. • Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. • Record data and results of increasing	• Use test results to make predictions to set up further comparative and fair tests. • Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in	• Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. • Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. • Record data and results of increasing	• Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. • Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. • Record data and results of increasing	

• Report and present 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. • Identify scientific evidence that has been used to support or refute ideas or arguments.	complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. • Use test results to make predictions to set up further comparative and fair tests. • Report and present 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.	oral and written forms such as displays and other presentations. • Identify scientific evidence that has been used to support or refute ideas or arguments.	complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. • Report and present 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. • Identify scientific evidence that has been used to support or refute ideas or arguments.	complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. • Report and present 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. • Identify scientific evidence that has been used to support or refute ideas or arguments.	
Key Vocabulary All children to know the meaning of these words by the end of the unit					
light travels straight reflect reflection light source object shadows mirrors	voltage brightness volume switches danger series circuit electricity electrical safety sign	Living things Change Fossils Offspring Vary Not identical Characteristics Variation Evolution	Micro-organisms Plants Animal Classification Classify Invertebrates Insects Spiders Snails	<u>Human internal organs</u> Heart, lungs, liver, kidney, brain Skeleton – skeletal Muscle muscular Digest Digestion <u>Human circulatory system</u>	

periscope rainbow filters	circuit diagram switch bulb buzzer motor recognised symbols	Adaption Inherit Inheritance Adapt Environment Extreme Conditions Advantageous Disadvantageous	Worms Vertebrates Fish Amphibians Reptiles Birds Mammals	Heart – blood – vessels – blood Impact Diet Exercise Drugs Lifestyle Nutrients Water Damage Alcohol substances	
Enrichment Opportunities Trips / visitors/ WOW moments					
Over Strand – Residential Trip		British Science Week – LIVE Lesson		Norfolk Show Crucial Crew Lesson taster at Attleborough Academy	