

Science

‘All things are possible...’

At Benedict Biscop we want our children to know that all things are possible. We want our children to aspire and to achieve highly. We want all children to have a strong understanding of the world around them whilst acquiring specific disciplinary skills and substantive knowledge to help them to live and think scientifically, to gain an understanding of scientific processes and also an understanding of the uses and implications of Science, today and for the future.

Characteristics of Scientist:

- The ability to think independently and raise questions about working scientifically and the knowledge and skills that it brings.
- Confidence and competence in the full range of practical skills, taking the initiative in, for example, planning and carrying out scientific investigations.
- Excellent scientific knowledge and understanding which is demonstrated in written and verbal explanations, solving challenging problems and reporting scientific findings.
- High levels of originality, imagination or innovation in the application of skills.
- The ability to undertake practical work in a variety of contexts.
- A passion for science and its application in past, present and future technologies.

At Benedict Biscop, scientific enquiry skills are embedded in each topic the children study and these topics are revisited and developed throughout their time at school. Topics, such as Plants, are taught in each phase progressionally [from Early Years to Key Stage Two in greater detail]. This model allows children to build upon their prior knowledge and increases their enthusiasm for the topics whilst embedding this procedural knowledge into the long-term memory. All children are encouraged to develop and use a range of skills including observations, planning and investigations, as well as being encouraged to question the world around them and become independent learners in exploring possible answers for their scientific based questions. Specialist vocabulary for topics is taught and built up, and effective questioning to communicate ideas is encouraged. Concepts taught should be reinforced by focusing on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions.

EYFS Statutory Framework –Understanding of the World.

Understanding the world involves guiding children to make sense of their physical world and their community. The frequency and range of children’s personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries, and museums to meeting important members of society such as police officers, nurses, and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes, and poems will foster their understanding of our culturally, socially, technologically, and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children’s vocabulary will support later reading comprehension.

Early Learning Goals:

Understanding of the World

Children at the expected level of development will:

The Natural World:

- Explore the natural world around them, making observations and drawing pictures of animals and plants.
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Development Matters progression related to Science:

Birth to Three	Three to Four	Reception
Knowledge and Understanding of the World -Repeat actions that have an effect -Explore materials with different properties -Explore natural materials, indoors and outside -Explore and respond to natural phenomena in their setting and on trips	Knowledge and Understanding of 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 wider, more appropriate vocabulary -Explore how things work -Plant seeds and care for growing plants -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	Knowledge and Understanding of the World -Repeat actions that have an effect. -Explore materials with different properties -Explore natural materials, indoors and outside. -Explore and respond to natural phenomena in their setting and on trips -Understand the key features of the life cycle of a plant and an animal

NURSERY

Autumn Term	Spring Term	Summer Term
-Begin to talk about myself -Name some different stages in development e.g. baby, child, adult -Name facial body parts -Describe simple basic needs e.g. warmth food, sleep, water -Describe changes they see in weather and plants -Name some seasons and explore seasonal fruits e.g. squashes, strawberries Explore a variety of manmade and natural materials including their properties and change of state through cooking, being outdoors and exploring ice/snow, exploring shadows.	-Talk about Autumn and Winter i.e. the changes with the environment, weather, how it impacts on us -Talk about Spring in detail i.e. the changes with the environment, weather, how it impacts on us -Know appropriate clothing for different times of the year e.g. hats/gloves in winter -Plant seeds and bulbs to observe growth and decay over time. -Begin to know how we care for plants Care for the immediate environment by keeping it clean, watering plants etc.	- Talk about Summer i.e. the changes with the environment, weather, how it impacts on us -Know animals that live inside (pets) and outside (wild) -Know animals grow from young to adult and talk about visible changes -Name basic features of animals -Identify invertebrates in immediate environment (spiders, worms, snails) -Learn how we might show care for animals -learn about changes in a lifecycle e.g. caterpillar to butterfly, tadpole to frog and talk about visible changes

RECEPTION

Autumn Term	Spring Term	Summer Term
-Begin to gain an awareness in the stages of a human and the order of these lifecycles e.g. baby comes before child -To know what their sense are (hearing, smell, sight, touch, taste) -To use their senses and describe what they can sense -To describe differences and similarities between themselves and others -To describe changes in weather and how they impact on us -To notice change over time e.g. change in leaf colour, decay of vegetables, picked flowers -To learn that some animals hibernate and name some of these animals	-To describe changes to the environment linked to seasons and time of day -To name a range of materials in the environment and think about how they could be used based on their properties -Name simple parts of a plant -Name common plants found in our environment -Observe natural processes; such as ice melting, a sound causing vibration, transparency, shadows, magnetism, floating and sinking and begin to think about why this happens.	-Identify plants they eat and understand that we do not eat all plants -Think about basic animal food chains e.g. leaf/plant – insect – bird -Think about conditions for successful plant growth (sunlight, water) -To know animals in different parts of the world and to name these animals, thinking about their features/adaptations e.g. flubber on penguins. -Name some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences

National Curriculum Aims

The national curriculum for science aims to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Key Stage 1 Science

Pupils should be encouraged to:

- experience and observe phenomena

- look more closely at the natural and humanly-constructed world around them
- be curious and ask questions about what they notice
- develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information.
- use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways.
- use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

Working Scientifically is taught explicitly and clearly relates to the teaching of substantive science content in the programme of study.

Lower Key Stage 2 Science

Pupils should be encouraged to:

- explore, talk about, test and develop ideas about everyday phenomena and the relationships between living things and familiar environments
- develop their ideas about functions, relationships and interactions
- ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information.
- draw conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

Upper Key Stage 2 Science

Pupils should be encouraged to:

- explore and talk about their ideas; ask their own questions about scientific phenomena; and analyse functions, relationships and interactions more systematically
- encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates
- recognise that scientific ideas change and develop over time
- select the most appropriate ways to answer science 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 and finding things out using a wide range of secondary sources of information
- draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings

Progression in Working Scientifically

To meet our curriculum aims, we have identified core strands of learning [working scientifically] which run throughout our whole curriculum, these are progressional and build upon one another e.g. *to ask questions in EYFS/KS1, to ask relevant questions in LKS2 and to plan enquiries to answer scientific questions in UKS2.*

We have identified what this should look like at the end of key phases within the school from EYFS-Y6.

The curriculum is taught in a spiral design where learning is revisited and embedded – deepening learning and developing Mastery.

‘Working scientifically’ must be embedded within the content of biology, chemistry and physics, focusing on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry should include (these are progressional, year on year)

- observing over time; pattern seeking; identifying, classifying and grouping;
- comparative and fair testing (controlled investigations);
- researching using secondary sources

To generate ideas and ask questions	EXPECTATIONS IN EYFS	
	NURSERY	RECEPTION
	- Talk about what they see, using some relevant vocabulary. - Explore how things work through hands-on experiences - Talk about what they see, hear and feel	- Talk about what they see, using a wider ranging, descriptive and relevant vocabulary. - Explore how things work through hands on experiences and talk about this process. - Describe what they see, hear and feel using relevant vocabulary
To investigate, observe and record	EXPECTATIONS IN EYFS	
	NURSERY	RECEPTION
	- Use all their senses in hands-on exploration of materials. - Explore how things work and the world around them through experiences - Describe what they see, hear and feel.	- Use senses to explore materials and use relevant vocabulary to describe these. - Explore how things work, and the world around them through hands on experiences, extending this by talking about the experience and process. - Describe what they see, hear and feel using relevant vocabulary
To conclude ideas and concepts	EXPECTATIONS IN EYFS	
	NURSERY	RECEPTION
	Talk about what they see using some relevant vocabulary	Talk about what they see, using a wider ranging, descriptive and relevant vocabulary.
To evaluate	EXPECTATIONS IN EYFS	
	NURSERY	RECEPTION
		To begin to evaluate some processes through hands on experiences e.g. what worked?

Ask simple questions and recognising that they can be answered in different ways	EXPECTATIONS AT KS1	
	- 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.	
	YEAR 1	YEAR 2
	✓ While exploring the world, 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. ✓ Answer questions developed with the teacher often through a scenario.	✓ While exploring the world, 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, answer these questions. ✓ Answer questions developed through a scenario. ✓ The children 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.
Observe closely, using simple equipment	EXPECTATIONS AT KS1	
	YEAR 1	YEAR 2
	✓ 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. ✓ Begin to take measurements, initially by comparisons, then using non-standard units.	✓ Explore the world around them. Make careful observations to support identification, comparison and noticing change. ✓ Use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations. ✓ Begin to take measurements, initially by comparisons, nonstandard and then standard units.
Performing simple tests	EXPECTATIONS AT KS1	
	YEAR 1	YEAR 2
	✓ Use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. ✓ They carry out: comparative tests and make observations over time.	✓ Use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. ✓ Carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time.
Identifying and classifying	EXPECTATIONS AT KS1	
	YEAR 1	YEAR 2
	✓ Children use their observations and testing to compare objects, materials and living things. ✓ They sort and group these things. ✓ They use simple secondary sources (such as identification sheets) to name living things. ✓ They describe the characteristics they used to identify a living thing.	✓ Use observations and testing to compare objects, materials and living things. ✓ Sort and group these things, identifying own criteria for sorting. ✓ Use simple secondary sources (such as identification sheets) to name living things. ✓ Describe the characteristics used to identify a living thing using scientific vocabulary
using their observations and ideas to suggest answers to questions	EXPECTATIONS AT KS1	
	YEAR 1	YEAR 2
	✓ Use their experiences of the world around them to suggest answers to questions. ✓ They are supported to relate answers to questions to their evidence e.g. observations they have made. ✓ Recognise 'biggest and smallest', 'best and worst' etc. from their data.	✓ Use their experiences of the world around them to suggest scientifically appropriate answers to questions. ✓ They are supported to relate answers to questions to their evidence e.g. observations they have made; measurements they have taken or information they have gained from secondary sources. ✓ Recognise 'biggest and smallest', 'best and worst' etc. from their data.
- gathering and recording data to help in answering questions	EXPECTATIONS AT KS1	
	YEAR 1	YEAR 2
	- Record observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. - Record measurements e.g. using prepared tables, pictograms - Classify using sorting rings.	✓ Record observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. ✓ Record measurements e.g. using prepared tables, pictograms, tally charts and block graphs. ✓ Classify using simple tables and sorting rings.

Ask relevant questions and use different types of scientific enquiries to answer them	EXPECTATIONS AT LOWER KS2	
	- 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.	
	YEAR 3	YEAR 4
	✓ Consider their prior knowledge when asking questions. ✓ Use a range of question stems. ✓ Answer questions posed by the teacher. ✓ Given a range of resources, decide for themselves how to gather evidence to answer the question.	✓ Consider their prior knowledge when asking questions. ✓ Independently use a range of question stems. ✓ Answer questions posed by the teacher. ✓ Given a range of resources, decide for themselves how to gather evidence to answer the question. ✓ Recognise when secondary sources can be used to answer questions that cannot be answered through practical work. Identify the type of that they have chosen to answer their question
Making systematic and careful observations and measurements using standard units	EXPECTATIONS AT LOWER KS2	
	YEAR 3	YEAR 4
	✓ Children make careful observations. ✓ Use a range of equipment for measuring length, time, temperature and capacity. ✓ They use standard units for their measurements.	✓ Children make systematic and careful observations. ✓ Use a range of equipment for measuring length, time, temperature and capacity with increasing accuracy. ✓ They use standard units for their measurements.
Gather, classify and record data to answer questions	EXPECTATIONS AT LOWER KS2	
	YEAR 3	YEAR 4
	✓ Decide how to record and present evidence best with teacher guidance ✓ They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. ✓ Record their data e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). ✓ They record classifications e.g. Venn diagrams, Carroll diagrams. ✓ Children are supported to present the same data in different ways in order to help with answering the question.	✓ Independently decide how to record and present evidence. ✓ They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. ✓ Record their data e.g. using tables, tally charts and bar charts ✓ They record classifications e.g. Venn diagrams, Carroll diagrams. ✓ Children can choose how to present the same data in different ways in order to help with answering the question.
Reporting on findings from enquiries including oral and written explanations, displays or presentations of results and conclusions.	EXPECTATIONS AT LOWER KS2	
	YEAR 3	YEAR 4
	✓ Communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary	✓ With confidence, communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary which is used consistently throughout
Set up a fair test	EXPECTATIONS AT LOWER KS2	
	YEAR 3	YEAR 4
	✓ Select from a selection of practical resources to gather evidence to answer questions generated by themselves or the teacher. ✓ Follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time	✓ Select from a wide range of practical resources to gather evidence to answer questions generated by themselves or the teacher. ✓ Follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking
- Use results to draw simple conclusions, suggest improvements and raise further questions.	EXPECTATIONS AT LOWER KS2	
	YEAR 3	YEAR 4
	✓ Identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry.	✓ Identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry – and articulate why

	✓ The answers they give are consistent with the evidence. ✓ Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry	✓ 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 they have gained from secondary sources. ✓ The answers are consistent with the evidence. ✓ Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry
- Using straightforward scientific evidence to answer questions or to support their findings	EXPECTATIONS AT LOWER KS2	
	YEAR 3	YEAR 4
	✓ Answer their own and others' questions based on observations they have made, measurements they have taken or information gathered.	✓ Answer their own and others' questions based on observations they have made; measurements they have taken or information gathered. Using relevant scientific vocabulary with appropriateness.

Plan scientific enquiry to answer question and recognise and control variables where necessary	EXPECTATIONS UPPER KS2	
	- 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 a 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	
	YEAR 5 ✓ Select from practical resources to gather evidence to answer their questions. ✓ Carry out fair tests, recognising and controlling variables. ✓ Decide what observations or measurements to make over time and for how long. ✓ Look for patterns and relationships using a suitable sample.	YEAR 6 ✓ Select from a wide range of practical resources to gather evidence to answer their questions. ✓ They carry out fair tests, recognising and controlling variables. ✓ Decide what observations or measurements to make over time and for how long, giving a rationale for this. ✓ Look for patterns and relationships using a suitable sample. ✓ 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. ✓ Decide for themselves how to gather evidence to answer a scientific question. ✓ Choose a type of enquiry to carry out and justify their choice. ✓ Recognise how secondary sources can be used to answer questions that cannot be answered through practical work.
Report and present findings from enquiries, including conclusions, causal relationships and explanations of degree of trust in results, in oral and written forms such as displays and other presentations	EXPECTATIONS AT UPPER KS2	
	YEAR 5	YEAR 6
	✓ Communicate their findings to an audience using relevant scientific language and illustrations. ✓ Record the results of a survey using a classification key ✓ Record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys. ✓ In their conclusions: identify causal relationships and patterns in the natural world from their evidence ✓ Evaluate, for example, the choice of method used, the control of variables	✓ Communicate their findings to an audience using relevant scientific language and illustrations. ✓ Record the results of a survey using a classification key ✓ Record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys. ✓ In their conclusions: identify causal relationships and patterns in the natural world from their evidence ✓ Present the same data in different ways in order to help with answering questions. ✓ Identify results that do not fit the overall pattern; and explain their findings using their subject knowledge. ✓ 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. ✓ Identify any limitations that reduce the trust they have in their data.
Measure, using a range of equipment and taking repeat readings	EXPECTATIONS AT UPPER KS2	
	YEAR 5	YEAR 6
	✓ 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, 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)	✓ Select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale and give a rationale as to why they are being used. ✓ During an enquiry, 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).
Gather and record data using tables and graphs	EXPECTATIONS AT UPPER KS2	
	YEAR 5	YEAR 6
	✓ 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. ✓ 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.	✓ Decide how to record and present evidence in the most appropriate way. ✓ Record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. ✓ Record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. ✓ Record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys. ✓ Present the same data in different ways in order to help with answering the question.
Identifying scientific evidence that has been used to support or refute ideas or arguments.	EXPECTATIONS AT UPPER KS2	
	YEAR 5	YEAR 6
	✓ Answer their own and others' questions based on observations they have made; measurements they have taken or information they have gained from secondary sources.	✓ 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. ✓ Talk about how their scientific ideas change due to new evidence that they have gathered. Talk about how new discoveries change scientific understanding.

Progression in Plants

*Note red objectives are for reference only (showing links)

	EYFS	KS1		LKS2		UKS2	
	Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Unit Specific Learning Objectives	• 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. • Begin to understand the need to respect and care for the natural environment and all living things. • Explore the natural world around them. • Describe what they see, hear and feel whilst outside. • Understand the effect of changing seasons on the natural world around them • Explore the natural world around them, making observations and drawing pictures of animals and plants.. • Understand some important processes and changes in the natural world.	• identify and name a variety of common wild and garden plants, including deciduous and evergreen trees • become familiar with plant structures (including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem). • identify and describe the basic structure of a variety of common flowering plants, including trees. • observe the growth of flowers and vegetables that they have planted. • use the local environment throughout the year to explore and answer questions about plants growing in their habitat.	• identify and name a variety of common wild and garden plants, including deciduous and evergreen trees • become familiar with plant structures (including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem). • identify and describe the basic structure of a variety of common flowering plants, including trees. • observe the growth of flowers and vegetables that they have planted. • use the local environment throughout the year to explore and answer questions about plants growing in their habitat. • Identify and name a variety of plants and animals in their habitats, including microhabitats (Y2 Living things and their habitats)	• identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • introduced to the relationship between structure and function: the idea that every part has a job to do. • explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction. • 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.	• Recognise that living things can be grouped in a variety of ways. (Y4 - Living things and their habitats) • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. (Y4 – Living things and their habitats) • Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats)	• Describe the life process of reproduction in some plants and animals. (Y5 - 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. (Y6 - Living things and their habitats) • Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)

Progression in Living Things

*Note red objectives are for reference only (showing links)

	EYFS	KS1		LKS2		UKS2	
	Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Unit Specific Learning Objectives	- 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. - Begin to understand the need to respect and care for the natural environment and all living things. - Explore the natural world around them. - Describe what they see, hear and feel whilst outside. - Understand the effect of changing seasons on the natural world around them - Explore the natural world around them, making observations and drawing pictures of animals and plants.. - Understand some important processes and changes in the natural world.	- Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants) - Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants) - Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans) - Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals including humans) - Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 – Animals, including humans) - Observe changes across the four seasons. (Y1 - Seasonal change)	- Explore and compare the differences between things that are living, dead, and things that have never been alive. - 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. - Understand that all living things have certain characteristics that are essential for keeping them alive and healthy - raise and answer questions that help them to become familiar with the life processes that are common to all living things - Notice that animals, including humans, have offspring which grown into adults (Y2 Animals including humans)	Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants)	- 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. - use the local environment to raise and answer questions that help them to identify and study plants and animals in their habitat. - identify how the habitat changes throughout the year. - explore possible ways of grouping a wide selection of living things that include animals and flowering plants and non-flowering plants. - put vertebrate animals into groups	- 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. - observe life-cycle changes in a variety of living things, for example, plants in the vegetable garden or flower border, and animals in the local environment - find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals.	- 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. - introduced to the idea that broad groupings, such as micro-organisms, plants and animals can be subdivided. - Through direct observations where possible, they should classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals). - discuss reasons why living things are placed in one group and not another. - find out about the significance of the work of scientists such as Carl

					such as fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects • explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation. • Construct a variety of food chains, identifying producers, predators and prey (Y4 Animals, including humans)		Linnaeus, a pioneer of classification.
--	--	--	--	--	---	--	--

Progression in Animals Including Humans

*Note red objectives are for reference only (showing links)

	EYFS	KS1		LKS2		UKS2	
	Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Unit Specific Learning Objectives	• Talk about what they see, using a wide vocabulary. • 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 the natural world around them. • Describe what they see, hear and feel whilst outside. • Understand the effect of changing seasons on the natural world around them • Explore the natural world around them, making observations and drawing pictures of animals and plants. • Understand some important processes and changes in the natural world.	• 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 • To learn the names of the main body parts (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth) through games, actions, songs and rhymes.	• notice that animals, including humans, have offspring which grow into adults • introduced to the processes of reproduction and growth in animals. <i>The focus at this stage should be on questions that help pupils to recognise growth; they should not be expected to understand how reproduction occurs. The following examples might be used: egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep. Growing into adults can include reference to baby, toddler, child, teenager, adult.</i> • find out about and describe the basic needs of animals, including humans, for survival (water, shelter, food and air) • describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	• 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. • Know the importance of nutrition and explore the main body parts associated with the skeleton and muscles • find out how different parts of the body have special functions.	• 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. • introduced to the main body parts associated with the digestive system, for example, mouth, tongue, teeth, oesophagus, stomach and small and large intestine • explore questions that help main body parts to understand their special functions.	• describe the changes as humans develop to old age. • draw a timeline to indicate stages in the growth and development of humans. • learn about the changes experienced in puberty. • Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird (Y5 Living things and their habitats) • Describe the life processes of reproduction in some plants and animals (Y5 Living things and their habitats)	• identify and name the main parts of the human circulatory system, • 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. • explore and answer questions that help them to understand how the circulatory system enables the body to function. • learn how to keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body. • 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 (Y6 Living things and their habitats) • Give reasons for classifying plants and animals based on specific characteristics (Y6 Living things and their habitats)

Progression in Habitats

*Note red objectives are for reference only (showing links)

	EYFS	KS1		LKS2		UKS2	
	Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Unit Specific Learning Objectives	• Talk about what they see, using a wide vocabulary. • Begin to understand the need to respect and care for the natural environment and all living things. • Explore the natural world around them. • Describe what they see, hear and feel whilst outside. • Understand the effect of changing seasons on the natural world around them • Explore the natural world around them, making observations and drawing pictures of animals and plants. • Understand some important processes and changes in the natural world. • Know some similarities and differences between the natural world around them and contrasting environments.	• understand how to take care of animals taken from their local environment and the need to return them safely after study. • use the local environment throughout the year to explore and answer questions about animals in their habitat.	• Understand and use the terms ‘habitat’ (a natural environment or home of a variety of plants and animals) and ‘micro-habitat’ (a very small habitat, for example for woodlice under stones, logs or leaf litter) in context • identify and name a variety of plants and animals in their habitats, including microhabitats • raise and answer questions about the local environment that help them to identify and study a variety of plants and animals within their habitat and observe how living things depend on each other, for example, plants serving as a source of food and shelter for animals • compare animals in familiar habitats with animals found in less familiar habitats, for example, on the seashore, in woodland, in the ocean, in the rainforest. • 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.	SEE LIVING THINGS ABOVE FOR KS2 HABITAT LINKS.			

Progression in Evolution and Inheritance

*Note red objectives are for reference only (showing links)

	EYFS	KS1		LKS2		UKS2	
	Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Unit Specific Learning Objectives	• Talk about what they see, using a wide vocabulary. • Talk about members of their immediate family and community • . • Name and describe people who are familiar to them. • • Comment on images of familiar situations in the past. • • Talk about the lives of the people around them and their roles in society. •Understand the past through settings, characters and events encountered in books read in class and storytelling.		• 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. (Y2 - Living things and their habitats)	• Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Y3 - Rocks)	• Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats)		• 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. • introduced to the idea that characteristics are passed from parents to their offspring • appreciate that variation in offspring over time can make animals more or less able to survive in particular environments •

Progression in Seasonal Change

*Note red objectives are for reference only (showing links)

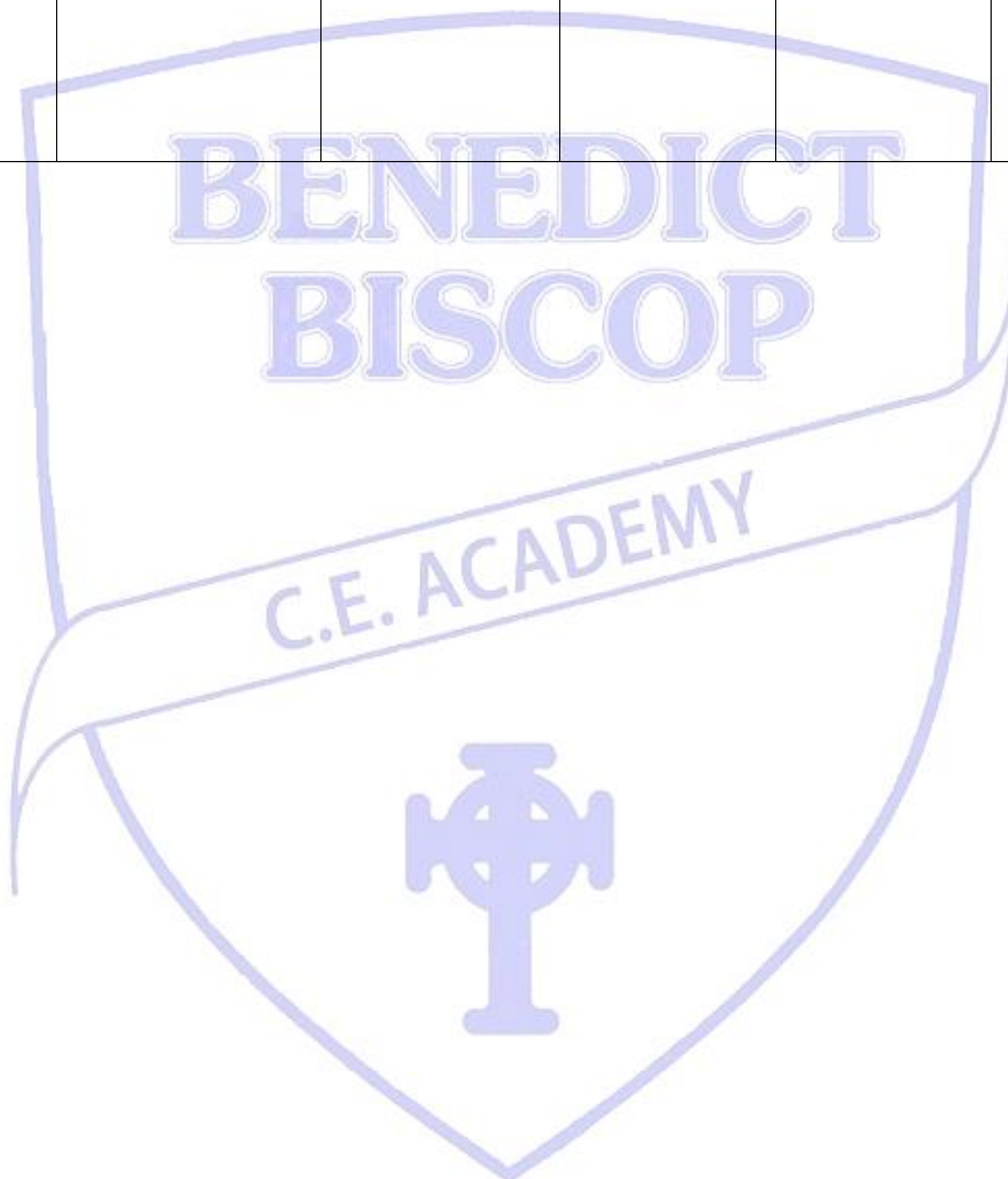
	EYFS	KS1		LKS2		UKS2	
	Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Unit Specific Learning Objectives	• Talk about what they see, using a wide vocabulary. • Explore the natural world around them. • Describe what they see, hear and feel whilst outside. • Recognise some environments that are different to the one in which they live. • Understand the effect of changing seasons on the natural world around them • 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. • Understand some important processes and changes in the natural world.	• observe changes across the four seasons • observe and describe weather associated with the seasons and how day length varies • observe and talk about changes in the weather and the seasons.		• Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. (Y3 - Light)		• Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky. (Y5 - Earth and space)	

Progression in Materials

*Note red objectives are for reference only (showing links)

	EYFS	KS1		LKS2		UKS2	
	Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Unit Specific Learning Objectives	• 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. • Talk about the differences between materials and changes they notice • Understand some important processes and changes in the natural world.	• 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. • explore, name, discuss and raise and answer questions about everyday materials so that they become familiar with the names of materials and properties such as: hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent • explore and experiment with a wide variety of materials for example: brick, paper, fabrics, elastic, foil.	• 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. • identify and discuss the uses of different everyday materials so that they become familiar with how some materials are used for more than one thing or different materials are used for the same thing • consider the properties of materials that make them suitable or unsuitable for particular purposes and they should be encouraged to think about unusual and creative uses for everyday materials.	• Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. (Y3 - Rocks) • Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Y3 - Rocks) • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. (Y3 - Forces and magnets)	• 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. • explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). • observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled.	• 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. • build a more systematic understanding of materials by exploring	

						and comparing the properties of a broad range of material	
--	--	--	--	--	--	---	--



Progression in Rocks

*Note red objectives are for reference only (showing links)

	EYFS	KS1		LKS2		UKS2	
	Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Unit Specific Learning Objectives	• 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. • Begin to understand the need to respect and care for the natural environment . • Talk about the differences between materials and changes they notice. • Explore the natural world around them. • Describe what they see, hear and feel whilst outside. • Explore the natural world around them, making observations and drawing pictures. • Understand some important processes and changes in the natural world.	• Distinguish between an object and the material from which it is made. (Y1 - Everyday materials) • Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials) • Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials) • Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - 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. (Y2 - Uses of everyday materials)	• 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. • explore different kinds of rocks and soils, including those in the local environment.			• Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. (Y6 - Evolution and inheritance)

Progression in Light

*Note red objectives are for reference only (showing links)

	EYFS	KS1		LKS2		UKS2	
	Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Unit Specific Learning Objectives	• Use all their senses in hands-on exploration of natural materials. • Talk about what they see, using a wide vocabulary. • Explore how things work. • 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 • Know some similarities and differences between the natural world around them and contrasting environments.	• Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans)		• 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. • explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them to answer questions about how light behaves. • why it is important to protect their eyes from bright lights. • look for, and measure, shadows, and find out how they are formed and what might cause the shadows to change.			• 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. • exploring the way that light behaves, including light sources, reflection and shadows. Pupils should talk about what happens and make predictions.

Progression in Forces

*Note red objectives are for reference only (showing links)

	EYFS	KS1		LKS2		UKS2	
	Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Unit Specific Learning Objectives	- Talk about what they see, using a wide vocabulary. - Explore how things work. - Explore and talk about different forces they can feel.		Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)	- 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. - observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary - explore the behaviour and everyday uses of different magnets		- 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. - explore falling objects and raise questions about the effects of air resistance. - explore the effects of air resistance by observing how different objects such as parachutes and sycamore seeds fall. - experience forces that make things begin to move, get faster or slow down - explore the effects of friction on movement and find out how it slows or stops moving objects, for example, by observing the effects of a brake on a bicycle wheel. - explore the effects of levers, pulleys and simple machines on movement - find out how scientists, for example, Galileo Galilei and Isaac Newton helped to develop the theory of gravitation.	

Progression in Sound

*Note red objectives are for reference only (showing links)

	EYFS	KS1		LKS2		UKS2	
	Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Unit Specific Learning Objectives	• Use all their senses in hands-on exploration of natural materials. • Talk about what they see, using a wide vocabulary. • Explore and talk about different forces they can feel. • Explore the natural world around them. • Describe what they see, hear and feel whilst outside.	• Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans)			• 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. • explore and identify the way sound is made through vibration in a range of different musical instruments • find out how the pitch and volume of sounds can be changed in a variety of ways		

Progression in Electricity

*Note red objectives are for reference only (showing links)

	EYFS	KS1		LKS2		UKS2	
	Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Unit Specific Learning Objectives	• 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.				• 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. • construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches • use their circuits to create simple devices • draw the circuit as a pictorial representation, not necessarily using conventional circuit symbols at this stage; these will be introduced in year 6. • understand the precautions for working safely with 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. • construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors. •

Progression in Earth and Space

*Note red objectives are for reference only (showing links)

	EYFS	KS1		LKS2		UKS2	
	Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Unit Specific Learning Objectives	• Talk about what they see, using a wide vocabulary. • Explore and talk about different forces they can feel. • 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 • Explore the natural world around them, making observations and drawing pictures • Know some similarities and differences between the natural world around them and contrasting environments. • Understand some important processes and changes in the natural world	• Observe changes across the four seasons. (Y1 - Seasonal changes) • Observe and describe weather associated with the seasons and how day length varies. (Y1 - Seasonal changes)				• 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. • introduced to a model of the Sun and Earth that enables them to explain day and night. • learn that the Sun is a star at the centre of our solar system and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006). • understand that a moon is a celestial body that orbits a planet (Earth has one moon; Jupiter has four large moons and numerous smaller ones). Understand how the geocentric model of the solar system gave way to the heliocentric model by considering the work of scientists such as Ptolemy, Alhazen and Copernicus.	

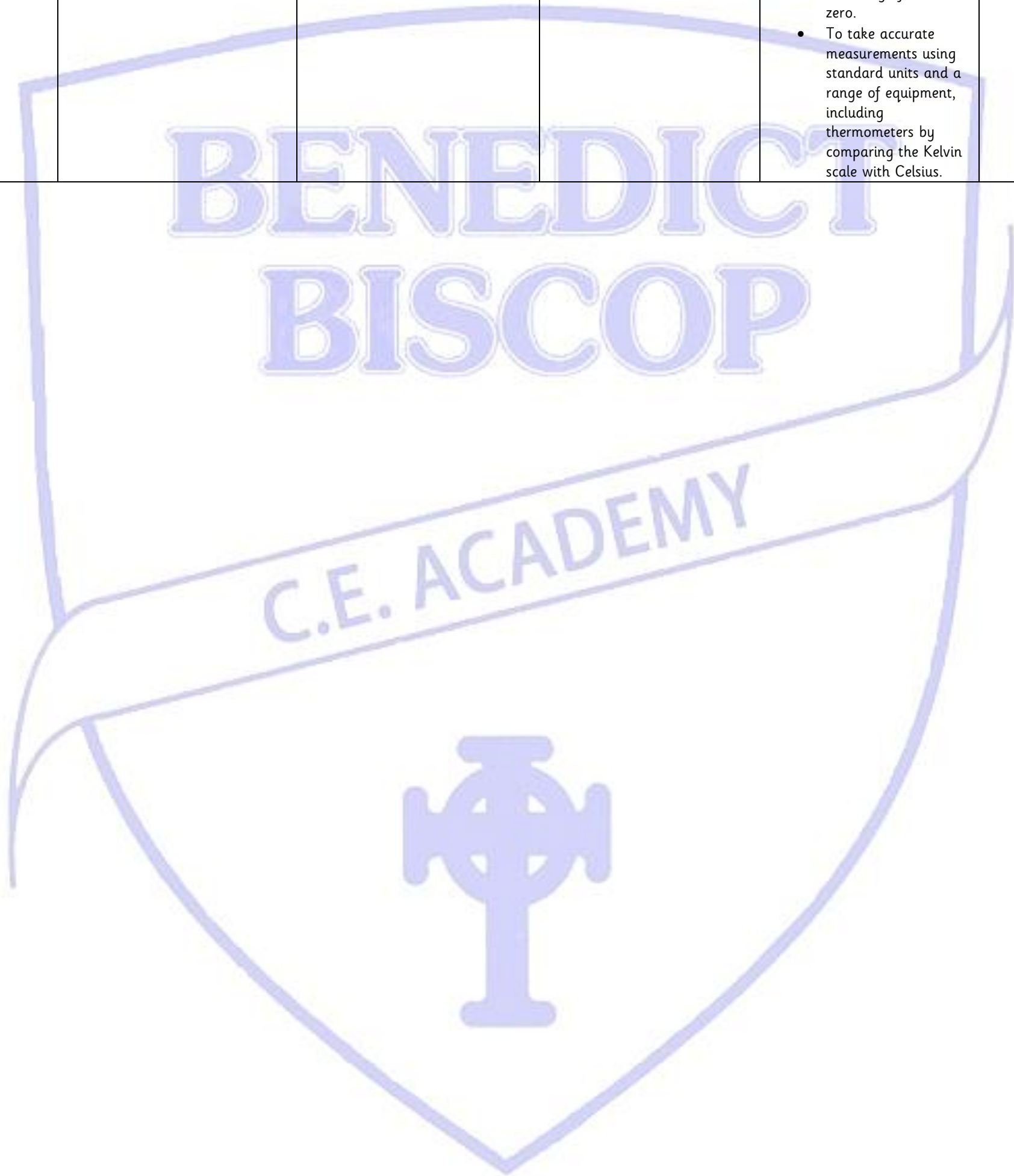
Scientist and Inventors- This unit is used to deepen understanding, developing greater depth.

The expectation in this unit is that staff will choose at least two scientists/inventors to look at in detail, based on the pupils' interests.

	EYFS	KS1		LKS2		UKS2	
	Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Unit Specific Learning Objectives	• Talk about what they see, using a wide vocabulary. • Talk about the lives of the people around them and their roles in society. • Understand the past through settings, characters and events encountered in books read in class and storytelling. • Explore how things work. • Begin to understand the need to respect and care for the natural environment and all living things. • Talk about the differences between materials and changes they notice. • Explore the natural world around them. • Describe what they see, hear and feel whilst outside. • Understand some important processes and changes in the natural world	LEGO • To describe the simple physical properties of a variety of everyday materials, by identifying the properties of plastic in the context of Lego. • To use observations to suggest answers to questions, by thinking about why Lego is made out of plastic. MAE JEMISON • To ask simple questions and use simple secondary sources to find answers, by role playing an interview with Mae Jemison ZOOS- including local farms/ aquariums • To describe and compare the structure of a variety of common animals, by sorting animals according to their features • To identify and classify animals, by sorting animals according to their features SENSORY GARDEN • To identify and name a variety of common wild and garden plants, by exploring a range of sensory plants. • To gather and record data to help in answering questions, by creating a chart showing the class' most popular sensory plants. MEASURING THE WEATHER- use in school weather station/ BBC Newcastle to see where it is filmed. • To observe and describe weather associated with the seasons, by measuring rainfall with a	Plants Greenhouse Growing – Eden Project- Doxford community gardens • To find out how plants need water, light and a suitable temperature to grow and stay healthy in the context of exploring how plants grow in greenhouses, including in the biomes at the Eden Project. • To find out how plants need water, light and a suitable temperature to grow and stay healthy in the context of comparing plant growth in and out of a greenhouse Brilliant Botany – Jane Colden- Winter Gardens Preston Park • To identify and describe the basic structure of common flowering plants by observing and sketching a range of common plants. • To observe closely using simple equipment by using a magnifying glass to sketch details of different plants. Animals Including Humans Elizabeth Garrett Anderson-doctors surgery • To use their observations and ideas to suggest answers to questions in the context of considering whether doctors are scientists. • To describe the importance for humans of exercise, of eating the right amounts of different types of food, and hygiene in the context of creating a poster for a doctor's surgery to	Plants Joseph Banks □ To identify differences, similarities or changes related to simple scientific ideas and processes by finding out about the men and women who introduced new plants to our gardens. □ To 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 by exploring the way that non-native plants have been discovered, transported and introduced. George Washington Carver- Washington Old Hall □ 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. □ To identify changes related to scientific ideas by describing the achievements of George Washington Carver. Animals Including Humans Marie Curie- Hospital X-ray dept □ To identify changes related to scientific ideas by describing Marie Curie's research into x-rays. □ To identify that humans have skeletons for support, protection and movement by identifying and explaining the bones shown in x-rays. Rocks- Great North Museum for fossils and	Living Things and their Habitats Gerald Durrell • To recognise that environments can change and that this can sometimes pose dangers to living things by exploring Gerald Durrell's conservation work in Madagascar. • To set up simple practical enquires and report on findings from enquires in the context of soil erosion and nutrient loss. Sound Alexander Graham Bell • To recognise that vibrations from sounds travel through a medium to the ear in the context of Alexander Graham Bell's invention of the telephone. • To report on findings, including oral and written presentations and displays in the context of Alexander Graham Bell's invention of the telephone. States of Matter Maria Telkes • Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers in context of building a solar oven. Electricity	Living Things and their Habitats David Attenborough- Current News Issues linked in • To find out about the work of naturalists and animal behaviourists in the context of the life and work of David Attenborough. Properties of Materials CSI- Police visit for investigations • To identify scientific evidence that has been used to support or refute ideas or arguments in the context of how CSI technicians use evidence to solve crimes. • To use knowledge of solids, liquids and gases to decide how mixtures might be separated in the context of using chromatography to solve a 'crime'. Earth and Space- Kielder observatory Margaret Hamilton • To describe how scientific ideas have changed over time in the context of Margaret Hamilton's development of the software for the Apollo Moon missions. Stonehenge • To identify scientific evidence that has been used to support or refute ideas in the context of the theories surrounding	Living things and their habitats- Libbie Hyman • To give reasons for classifying plants and animals based on specific characteristics in the context of Libbie Hyman's work on classifying vertebrates and invertebrates. Animals Including Humans – Marie Maynard Daly – NHS- school nurses • To recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function in the context of exploring Marie Maynard Daly's findings on diet and heart-health. Alexander Fleming • To record data using scatter graphs in the context of Fleming's discovery of penicillin. Dr Daniel Hale Williams- Heart Start • To identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood in the context of finding out about Dr Daniel Hale Williams, then labelling the parts and functions of the circulatory system. Mary Leakey- Evolution and Inheritance- linked into RE. • To recognise that living things have changed over time and that fossils

		rain gauge they have made - To gather and record data to help in answering questions, by measuring rainfall with a rain gauge they have made. AT THE VETS- get a vet into school or visit vets - To describe and compare the structure of a variety of common animals, including pets, by exploring the work of vets. - To identify and classify, by identifying the basic parts of animals' bodies	explain how to stay healthy. Louis Pasteur - To describe the importance of hygiene to humans in the context of investigating Louis Pasteur's work on how germs spread. - To use their observations and ideas to answer simple question in the context of investigating how germs spread and the effect of hand washing. Materials- Charles Macintosh - To find out about people who have developed new materials in the context of learning about Charles Macintosh - To identify and compare the suitability of a variety of everyday materials for particular uses in the context of testing materials to find the most suitable material for a waterproof coat. Living Things and Their Habitats Rachel Carson- West Boldon Lodge - To describe how animals obtain their food from plants and other animals, using the idea of a simple food chain in the context of exploring Rachel Carson's study of the ocean. - To observe closely, using simple equipment in the context of investigating the effects of pesticides in water, as researched by Rachel Carson.	rocks. William Smith ☐ 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 by exploring William Smith's principle of fossil succession. Inge Lehmann ☐ To compare and group together different kinds of rocks on the basis of their appearance and simple physical properties by finding out about Inge Lehmann's discovery of Earth's solid core and how this creates igneous rocks. Light Arthur James Wilson ☐ To notice that light is reflected from surfaces by investigating concave and convex mirrors. ☐ To ask relevant questions and use evidence from scientific enquiries to answer them and support findings by investigating concave and convex mirrors. ☐ To gather, record, classify and present data in a variety of ways to help in answering questions by investigating concave and convex mirrors.	Garrett Morgan - Construct a simple series electrical circuit, identifying and naming the basic parts, including cells, wires, bulbs, switches and buzzers. - Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit in context of creating a traffic light. Thomas Edison- Newcastle and Cragside - To identify changes related to scientific ideas and processes by exploring Thomas Edison's work with electricity locally and nationally. - To identify common electrical appliances that run on electricity by exploring Thomas Edison's work with electricity. States of matter Joseph Priestley - To compare and group materials together according to whether they are solids, liquids or gases by exploring the discovery of oxygen. - To identify changes relating to simple scientific ideas and processes by exploring the discovery of oxygen and the theory of phlogiston. Kelvin- Absolute Zero- Life Centre - To 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) by exploring Kelvin's	the alignment of the stones at Stonehenge. Animals including Humans Eva Crane- Washington Old Hall ☐ To describe the life process of reproduction in some plants and animals in the context of Eva Crane's research into the life cycle of bees.	provide information about living things that inhabited the Earth millions of years ago in the context of Mary Leakey's fossil findings in the Olduvai Gorge. Electricity Steve Jobs- Apple store To use recognised symbols when representing a simple circuit in a diagram in the context of the invention of Apple computers and the life of Steve Jobs.
--	--	--	---	---	--	--	---

					discovery of absolute zero. • To take accurate measurements using standard units and a range of equipment, including thermometers by comparing the Kelvin scale with Celsius.		
--	--	--	--	--	--	--	--



AUTUMN	Scientific Knowledge	Working Scientifically	Year One Expectations
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. - explore, name, discuss and raise and answer questions about everyday materials so that they become familiar with the names of materials and properties such as: hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent. - explore and experiment with a wide variety of materials for example: brick, paper, fabrics, elastic, foil.	Ask simple questions and recognising that they can be answered in different ways	- While exploring the world, 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. - Answer questions developed with the teacher often through a scenario.
		Observe closely, using simple equipment	- 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. - Begin to take measurements, initially by comparisons, then using non-standard units.
		Performing simple tests	- Use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. - They carry out: comparative tests and make observations over time.
		Identifying and classifying	- Children use their observations and testing to compare objects, materials and living things. - They sort and group these things. - They use simple secondary sources (such as identification sheets) to name living things. - They describe the characteristics they used to identify a living thing.
		using their observations and ideas to suggest answers to questions	- Use their experiences of the world around them to suggest answers to questions. - They are supported to relate answers to questions to their evidence e.g. observations they have made. - Recognise 'biggest and smallest', 'best and worst' etc. from their data
Seasonal change/weather (Autumn/ Winter) Scientists and Inventors	- observe changes across the four seasons - observe and describe weather associated with the seasons and how day length varies - observe and talk about changes in the weather and the seasons.	gathering and recording data to help in answering questions	- Record observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. - Record measurements e.g. using prepared tables, pictogram - Classify using sorting rings.

SPRING	Scientific Knowledge	Working Scientifically	Year One Expectations
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 - To learn the names of the main body parts (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth) through games, actions, songs and rhymes.	Ask simple questions and recognising that they can be answered in different ways	- While exploring the world, 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. - Answer questions developed with the teacher often through a scenario.
		Observe closely, using simple equipment	- 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. - Begin to take measurements, initially by comparisons, then using non-standard units.
		Performing simple tests	- Use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. - They carry out: comparative tests and make observations over time.
		Identifying and classifying	- Children use their observations and testing to compare objects, materials and living things. - They sort and group these things. - They use simple secondary sources (such as identification sheets) to name living things. - They describe the characteristics they used to identify a living thing.
Habitats of Animals	- understand how to take care of animals taken from their local environment and the need to return them safely after study. - use the local environment throughout the year to explore and answer questions about animals in their habitat.	using their observations and ideas to suggest answers to questions	- Use their experiences of the world around them to suggest answers to questions. - They are supported to relate answers to questions to their evidence e.g. observations they have made. - Recognise 'biggest and smallest', 'best and worst' etc. from their data

			gathering and recording data to help in answering questions	✓ Record observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. ✓ Record measurements e.g. using prepared tables, pictogram ✓ Classify using sorting rings.
SUMMER	Scientific Knowledge		Working Scientifically	Year One Expectations
Plants	• identify and name a variety of common wild and garden plants, including deciduous and evergreen trees • become familiar with plant structures (including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem). • identify and describe the basic structure of a variety of common flowering plants, including trees. • observe the growth of flowers and vegetables that they have planted. • use the local environment throughout the year to explore and answer questions about plants growing in their habitat.		Ask simple questions and recognising that they can be answered in different ways Observe closely, using simple equipment Performing simple tests Identifying and classifying	✓ While exploring the world, 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. ✓ Answer questions developed with the teacher often through a scenario. ✓ 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. ✓ Begin to take measurements, initially by comparisons, then using non-standard units. ✓ Use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. They carry out: comparative tests and make observations over time. ✓ Children use their observations and testing to compare objects, materials and living things. ✓ They sort and group these things. ✓ They use simple secondary sources (such as identification sheets) to name living things. ✓ They describe the characteristics they used to identify a living thing.
Seasonal change/weather (Spring/Summer)	• observe changes across the four seasons • observe and describe weather associated with the seasons and how day length varies • observe and talk about changes in the weather and the seasons.		using their observations and ideas to suggest answers to questions gathering and recording data to help in answering questions	✓ Use their experiences of the world around them to suggest answers to questions. ✓ They are supported to relate answers to questions to their evidence e.g. observations they have made. ✓ Recognise 'biggest and smallest', 'best and worst' etc. from their data ✓ Record observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. ✓ Record measurements e.g. using prepared tables, pictogram ✓ Classify using sorting rings.
Scientists and Inventors	<i>Choose at least two scientists/inventors to look at in detail (see Science and Inventors progression overview for possible objectives).</i>			

YEAR 2

*note red are END of Key Stage objectives

AUTUMN	Scientific Knowledge		Working Scientifically	Year Two Expectations
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. - use the local environment throughout the year to observe how different plants grow. - introduced to the requirements of plants for germination, growth and survival, as well as to the processes of reproduction and growth in plants		Ask simple questions and recognising that they can be answered in different ways	- While exploring the world, 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, answer these questions. - Answer questions developed through a scenario. 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.
			Observe closely, using simple equipment	- Explore the world around them. Make careful observations to support identification, comparison and noticing change. - Use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations. - Begin to take measurements, initially by comparisons, nonstandard and then standard units.
			Performing simple tests	- Use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. - Carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time.
			Identifying and classifying	- Use observations and testing to compare objects, materials and living things. - Sort and group these things, identifying own criteria for sorting. - Use simple secondary sources (such as identification sheets) to name living things. - Describe the characteristics used to identify a living thing using scientific vocabulary
Living Things	- Explore and compare the differences between things that are living, dead, and things that have never been alive. - 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. - Understand that all living things have certain characteristics that are essential for keeping them alive and healthy - raise and answer questions that help them to become familiar with the life processes that are common to all living things		using their observations and ideas to suggest answers to questions	- Use their experiences of the world around them to suggest scientifically appropriate answers to questions. - They are supported to relate answers to questions to their evidence e.g. observations they have made; measurements they have taken or information they have gained from secondary sources. - Recognise 'biggest and smallest', 'best and worst' etc. from their data.
			gathering and recording data to help in answering questions	- Record observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. - Record measurements e.g. using prepared tables, pictograms, tally charts and block graphs. - Classify using simple tables and sorting rings.

SPRING	Scientific Knowledge		Working Scientifically	Year Two Expectations
Habitats	- Understand and use the terms 'habitat' (a natural environment or home of a variety of plants and animals) and 'micro-habitat' (a very small habitat, for example for woodlice under stones, logs or leaf litter) in context - identify and name a variety of plants and animals in their habitats, including microhabitats - raise and answer questions about the local environment that help them to identify and study a variety of plants and animals within their habitat and observe how living things depend on each other, for example, plants serving as a source of food and shelter for animals - compare animals in familiar habitats with animals found in less familiar habitats, for example, on the seashore, in woodland, in the ocean, in the rainforest. - identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of		Ask simple questions and recognising that they can be answered in different ways	- While exploring the world, 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, answer these questions. - Answer questions developed through a scenario. 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.
			Observe closely, using simple equipment	- Explore the world around them. Make careful observations to support identification, comparison and noticing change. - Use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations. - Begin to take measurements, initially by comparisons, nonstandard and then standard units.
			Performing simple tests	- Use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. - Carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time.

Animals including human	different kinds of animals and plants, and how they depend on each other.		
	- notice that animals, including humans, have offspring which grow into adults - introduced to the processes of reproduction and growth in animals. <i>The focus at this stage should be on questions that help pupils to recognise growth; they should not be expected to understand how reproduction occurs. The following examples might be used: egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep. Growing into adults can include reference to baby, toddler, child, teenager, adult.</i> - find out about and describe the basic needs of animals, including humans, for survival (water, shelter, food and air) - describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	Identifying and classifying	✓ Use observations and testing to compare objects, materials and living things. ✓ Sort and group these things, identifying own criteria for sorting. ✓ Use simple secondary sources (such as identification sheets) to name living things. ✓ Describe the characteristics used to identify a living thing using scientific vocabulary
		using their observations and ideas to suggest answers to questions	✓ Use their experiences of the world around them to suggest scientifically appropriate answers to questions. ✓ They are supported to relate answers to questions to their evidence e.g. observations they have made; measurements they have taken or information they have gained from secondary sources. ✓ Recognise 'biggest and smallest', 'best and worst' etc. from their data.
		gathering and recording data to help in answering questions	✓ Record measurements e.g. using prepared tables, pictograms, tally charts and block graphs. ✓ Record observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. ✓ Classify using simple tables and sorting rings.

SUMMER	Scientific Knowledge		Working Scientifically	Year Two Expectations
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. - identify and discuss the uses of different everyday materials so that they become familiar with how some materials are used for more than one thing or different materials are used for the same thing - consider the properties of materials that make them suitable or unsuitable for particular purposes and they should be encouraged to think about unusual and creative uses for everyday materials.		Ask simple questions and recognising that they can be answered in different ways	- While exploring the world, 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, answer these questions. - Answer questions developed through a scenario. 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.
			Observe closely, using simple equipment	- Explore the world around them. Make careful observations to support identification, comparison and noticing change. - Use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations. - Begin to take measurements, initially by comparisons, nonstandard and then standard units.
			Performing simple tests	- Use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. - Carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time.
			Identifying and classifying	- Use observations and testing to compare objects, materials and living things. - Sort and group these things, identifying own criteria for sorting. - Use simple secondary sources (such as identification sheets) to name living things. - Describe the characteristics used to identify a living thing using scientific vocabulary
Scientists and Inventors	<i>Choose at least two scientists/inventors to look at in detail (see Science and Inventors progression overview for possible objectives).</i>		using their observations and ideas to suggest answers to questions	- Use their experiences of the world around them to suggest scientifically appropriate answers to questions. - They are supported to relate answers to questions to their evidence e.g. observations they have made; measurements they have taken or information they have gained from secondary sources. - Recognise 'biggest and smallest', 'best and worst' etc. from their data.
			gathering and recording data to help in answering questions	- Record observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. - Record measurements e.g. using prepared tables, pictograms, tally charts and block graphs. - Classify using simple tables and sorting rings.

YEAR 3

*note red are END of Key Stage objectives

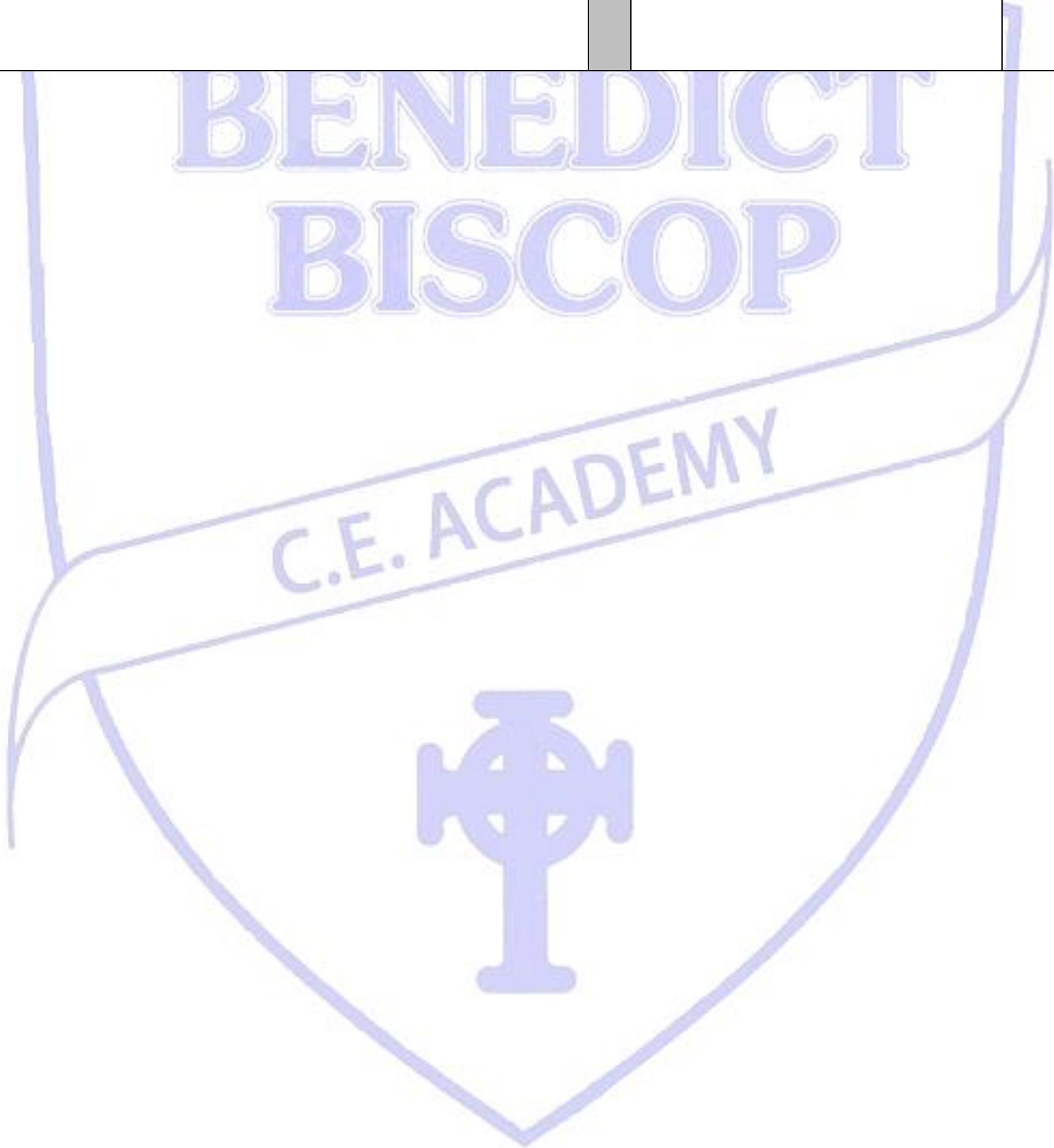
AUTUMN	Scientific Knowledge	Working Scientifically	Year Three Expectations
Plants	- identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers - introduced to the relationship between structure and function: the idea that every part has a job to do. - explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction. - 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.	Ask relevant questions and use different types of scientific enquiries to answer them Making systematic and careful observations and measurements using standard units Gather, classify and record data to answer questions Reporting on findings from enquiries including oral and written explanations, displays or presentations of results and conclusions.	✓ Consider their prior knowledge when asking questions. ✓ Use a range of question stems. ✓ Answer questions posed by the teacher. ✓ Given a range of resources, decide for themselves how to gather evidence to answer the question. ✓ Children make careful observations. ✓ Use a range of equipment for measuring length, time, temperature and capacity. They use standard units for their measurements. ✓ Decide how to record and present evidence best with teacher guidance ✓ They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. ✓ Record their data e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). ✓ They record classifications e.g. Venn diagrams, Carroll diagrams. ✓ Children are supported to present the same data in different ways in order to help with answering the question. ✓ Communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary
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. - Know the importance of nutrition and explore the main body parts associated with the skeleton and muscles - find out how different parts of the body have special functions.	Set up a fair test Use results to draw simple conclusions, suggest improvements and raise further questions. Using straightforward scientific evidence to answer questions or to support their findings	✓ Select from a selection of practical resources to gather evidence to answer questions generated by themselves or the teacher. ✓ Follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time ✓ Identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry. ✓ The answers they give are consistent with the evidence. ✓ Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry ✓ Answer their own and others' questions based on observations they have made, measurements they have taken or information gathered.

SPRING	Scientific Knowledge	Working Scientifically	Year Three Expectations
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. - explore different kinds of rocks and soils, including those in the local environment.	Ask relevant questions and use different types of scientific enquiries to answer them Making systematic and careful observations and measurements using standard units	✓ Consider their prior knowledge when asking questions. ✓ Use a range of question stems. ✓ Answer questions posed by the teacher. ✓ Given a range of resources, decide for themselves how to gather evidence to answer the question. ✓ Children make careful observations. ✓ Use a range of equipment for measuring length, time, temperature and capacity. ✓ They use standard units for their measurements.

			Gather, classify and record data to answer questions	✓ Decide how to record and present evidence best with teacher guidance ✓ They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. ✓ Record their data e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). ✓ They record classifications e.g. Venn diagrams, Carroll diagrams. ✓ Children are supported to present the same data in different ways in order to help with answering the question.
			Reporting on findings from enquiries including oral and written explanations, displays or presentations of results and conclusions.	✓ Communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary
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. • observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary • explore the behaviour and everyday uses of different magnets		Set up a fair test	✓ Select from a selection of practical resources to gather evidence to answer questions generated by themselves or the teacher. ✓ Follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time
			Use results to draw simple conclusions, suggest improvements and raise further questions.	✓ Identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry. ✓ The answers they give are consistent with the evidence. ✓ Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry
			Using straightforward scientific evidence to answer questions or to support their findings	✓ Answer their own and others' questions based on observations they have made, measurements they have taken or information gathered.

SUMMER	Scientific Knowledge		Working Scientifically	Year Three Expectations
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. • explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them to answer questions about how light behaves. • why it is important to protect their eyes from bright lights. • look for, and measure, shadows, and find out how they are formed and what might cause the shadows to change.		Ask relevant questions and use different types of scientific enquiries to answer them	✓ Consider their prior knowledge when asking questions. ✓ Use a range of question stems. ✓ Answer questions posed by the teacher. ✓ Given a range of resources, decide for themselves how to gather evidence to answer the question.
			Making systematic and careful observations and measurements using standard units	✓ Children make careful observations. ✓ Use a range of equipment for measuring length, time, temperature and capacity. They use standard units for their measurements.
			Gather, classify and record data to answer questions	✓ Decide how to record and present evidence best with teacher guidance ✓ They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. ✓ Record their data e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). ✓ They record classifications e.g. Venn diagrams, Carroll diagrams. ✓ Children are supported to present the same data in different ways in order to help with answering the question.
			Reporting on findings from enquiries including oral and written explanations, displays or presentations of results and conclusions.	✓ Communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary
Scientists and Inventors	<i>Choose at least two scientists/inventors to look at in detail (see Science and Inventors progression overview for possible objectives).</i>		Set up a fair test	✓ Select from a selection of practical resources to gather evidence to answer questions generated by themselves or the teacher. Follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time
			Use results to draw simple conclusions, suggest improvements and raise further questions.	✓ Identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry. ✓ The answers they give are consistent with the evidence. Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry

			Using straightforward scientific evidence to answer questions or to support their findings	Answer their own and others' questions based on observations they have made, measurements they have taken or information gathered.
--	--	--	--	--



YEAR 4

*note red are END of Key Stage objectives

AUTUMN	Scientific Knowledge		Working Scientifically	Year Four Expectations
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. - introduced to the main body parts associated with the digestive system, for example, mouth, tongue, teeth, oesophagus, stomach and small and large intestine - explore questions that help main body parts to understand their special functions.		Ask relevant questions and use different types of scientific enquiries to answer them	- Consider their prior knowledge when asking questions. Independently use a range of question stems. - Answer questions posed by the teacher. - Given a range of resources, decide for themselves how to gather evidence to answer the question. Recognise when secondary sources can be used to answer questions that cannot be answered through practical work. Identify the type of that they have chosen to answer their question
			Making systematic and careful observations and measurements using standard units	- Children make systematic and careful observations. - Use a range of equipment for measuring length, time, temperature and capacity with increasing accuracy. They use standard units for their measurements.
			Gather, classify and record data to answer questions	Independently decide how to record and present evidence. - They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. - Record their data e.g. using tables, tally charts and bar charts - They record classifications e.g. Venn diagrams, Carroll diagrams. Children can choose how to present the same data in different ways in order to help with answering the question.
			Reporting on findings from enquiries including oral and written explanations, displays or presentations of results and conclusions.	With confidence, communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary which is used consistently throughout
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. - construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches - use their circuits to create simple devices - draw the circuit as a pictorial representation, not necessarily using conventional circuit symbols at this stage; these will be introduced in year 6. - understand the precautions for working safely with electricity.		Set up a fair test	- Select from a wide range of practical resources to gather evidence to answer questions generated by themselves or the teacher. - Follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking
			Use results to draw simple conclusions, suggest improvements and raise further questions.	- Identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry – and articulate why 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 they have gained from secondary sources. - The answers are consistent with the evidence. - Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry
			Using straightforward scientific evidence to answer questions or to support their findings	Answer their own and others' questions based on observations they have made; measurements they have taken or information gathered. Using relevant scientific vocabulary with appropriateness.

SPRING	Scientific Knowledge		Working Scientifically	Year Four Expectations
All living things	☐ 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		Ask relevant questions and use different types of scientific enquiries to answer them	- Consider their prior knowledge when asking questions. Independently use a range of question stems. - Answer questions posed by the teacher. - Given a range of resources, decide for themselves how to gather evidence to answer the question. Recognise when secondary sources can be used to answer questions that cannot be answered through practical work. Identify the type of that they have chosen to answer their question

	□ recognise that environments can change and that this can sometimes pose dangers to living things. □ use the local environment to raise and answer questions that help them to identify and study plants and animals in their habitat. □ identify how the habitat changes throughout the year. □ explore possible ways of grouping a wide selection of living things that include animals and flowering plants and non-flowering plants. □ put vertebrate animals into groups such as fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects □ explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation.		Making systematic and careful observations and measurements using standard units Gather, classify and record data to answer questions Reporting on findings from enquiries including oral and written explanations, displays or presentations of results and conclusions.	✓ Children make systematic and careful observations. ✓ Use a range of equipment for measuring length, time, temperature and capacity with increasing accuracy. ✓ They use standard units for their measurements. ✓ Independently decide how to record and present evidence. ✓ They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. ✓ Record their data e.g. using tables, tally charts and bar charts ✓ They record classifications e.g. Venn diagrams, Carroll diagrams. Children can choose how to present the same data in different ways in order to help with answering the question. ✓ With confidence, communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary which is used consistently throughout
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. • explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). • observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled.		Set up a fair test Use results to draw simple conclusions, suggest improvements and raise further questions. Using straightforward scientific evidence to answer questions or to support their findings	✓ Select from a wide range of practical resources to gather evidence to answer questions generated by themselves or the teacher. Follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking ✓ Identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry – and articulate why ✓ 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 they have gained from secondary sources. ✓ The answers are consistent with the evidence. ✓ Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry ✓ Answer their own and others' questions based on observations they have made; measurements they have taken or information gathered. Using relevant scientific vocabulary with appropriateness.

SUMMER	Scientific Knowledge		Key generic learning objectives	Year Four Expectations
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. • explore and identify the way sound is made through vibration in a range of different musical instruments • find out how the pitch and volume of sounds can be changed in a variety of ways.		Ask relevant questions and use different types of scientific enquiries to answer them Making systematic and careful observations and measurements using standard units Gather, classify and record data to answer questions	✓ Consider their prior knowledge when asking questions. ✓ Independently use a range of question stems. ✓ Answer questions posed by the teacher. ✓ Given a range of resources, decide for themselves how to gather evidence to answer the question. Recognise when secondary sources can be used to answer questions that cannot be answered through practical work. Identify the type of that they have chosen to answer their question ✓ Children make systematic and careful observations. ✓ Use a range of equipment for measuring length, time, temperature and capacity with increasing accuracy. They use standard units for their measurements. ✓ Independently decide how to record and present evidence. ✓ They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. ✓ Record their data e.g. using tables, tally charts and bar charts ✓ They record classifications e.g. Venn diagrams, Carroll diagrams. Children can choose how to present the same data in different ways in order to help with answering the question.

			Reporting on findings from enquiries including oral and written explanations, displays or presentations of results and conclusions.	With confidence , communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary which is used consistently throughout
Scientists and Inventors	<i>Choose at least two scientists/inventors to look at in detail (see Science and Inventors progression overview for possible objectives).</i>		Set up a fair test	✓ Select from a wide range of practical resources to gather evidence to answer questions generated by themselves or the teacher. Follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking
			Use results to draw simple conclusions, suggest improvements and raise further questions.	✓ Identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry – and articulate why ✓ 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 they have gained from secondary sources. ✓ The answers are consistent with the evidence. Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry
			Using straightforward scientific evidence to answer questions or to support their findings	Answer their own and others' questions based on observations they have made; measurements they have taken or information gathered. Using relevant scientific vocabulary with appropriateness.



YEAR 5

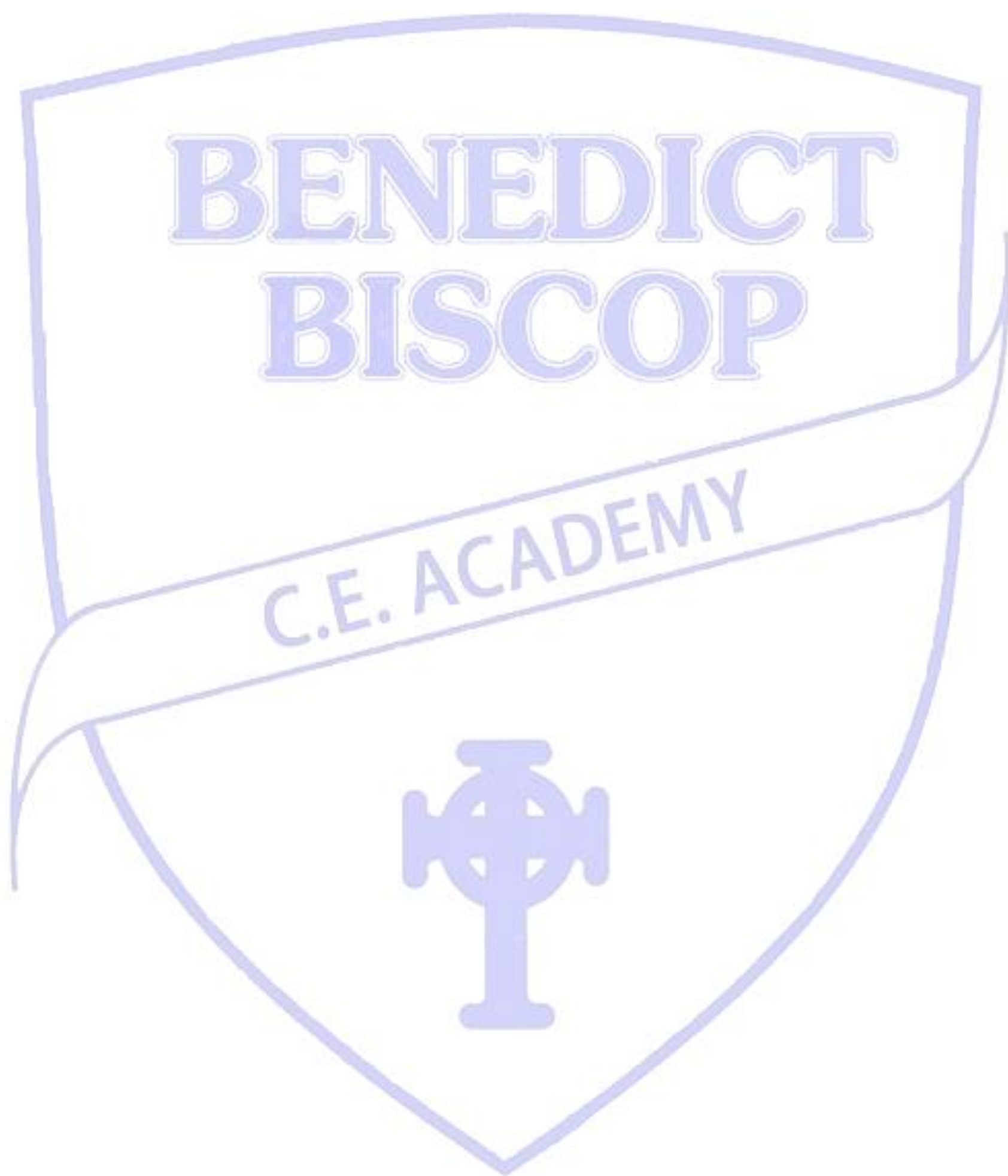
*note red are END of Key Stage objectives

AUTUMN	Scientific Knowledge	Working Scientifically	Year Five Expectations
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. - observe life-cycle changes in a variety of living things, for example, plants in the vegetable garden or flower border, and animals in the local environment - find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals.	Plan scientific enquiry to answer question and recognise and control variables where necessary Report and present findings from enquiries, including conclusions, causal relationships and explanations of degree of trust in results, in oral and written forms such as displays and other presentations Measure, using a range of equipment and taking repeat readings Gather and record data using tables and graphs	- Select from practical resources to gather evidence to answer their questions. - Carry out fair tests, recognising and controlling variables. - Decide what observations or measurements to make over time and for how long. - Look for patterns and relationships using a suitable sample. - Communicate their findings to an audience using relevant scientific language and illustrations. - Record the results of a survey using a classification key - Record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys. - In their conclusions: identify causal relationships and patterns in the natural world from their evidence - Evaluate, for example, the choice of method used, the control of variables - 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, 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) - 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. - 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.
Animals including humans	- describe the changes as humans develop to old age. - draw a timeline to indicate stages in the growth and development of humans. - learn about the changes experienced in puberty.	Identifying scientific evidence that has been used to support or refute ideas or arguments.	Answer their own and others' questions based on observations they have made; measurements they have taken or information they have gained from secondary sources.

SPRING	Scientific Knowledge	Working Scientifically	Year Five Expectations
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. - build a more systematic understanding of materials by exploring and comparing the properties of a broad range of materials - explore reversible changes, including, evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes. - explore changes that are difficult to reverse, for example, burning, rusting and other reactions, for example, vinegar with bicarbonate of soda. - observe that some conductors will produce a brighter bulb in a circuit than others and that some materials will feel hotter than others when a heat source is placed against them. Safety guidelines should be followed when burning materials.	Plan scientific enquiry to answer question and recognise and control variables where necessary Report and present findings from enquiries, including conclusions, causal relationships and explanations of degree of trust in results, in oral and written forms such as displays and other presentations Measure, using a range of equipment and taking repeat readings Gather and record data using tables and graphs Identifying scientific evidence that has been used to support or refute ideas or arguments.	- Select from practical resources to gather evidence to answer their questions. - Carry out fair tests, recognising and controlling variables. - Decide what observations or measurements to make over time and for how long. - Look for patterns and relationships using a suitable sample. - Communicate their findings to an audience using relevant scientific language and illustrations. - Record the results of a survey using a classification key - Record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys. - In their conclusions: identify causal relationships and patterns in the natural world from their evidence - Evaluate, for example, the choice of method used, the control of variables - 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, 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) - 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. - 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. - Answer their own and others' questions based on observations they have made; measurements they have taken or information they have gained from secondary sources.

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. - introduced to a model of the Sun and Earth that enables them to explain day and night. - learn that the Sun is a star at the centre of our solar system and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006). - understand that a moon is a celestial body that orbits a planet (Earth has one moon; Jupiter has four large moons and numerous smaller ones). Understand how the geocentric model of the solar system gave way to the heliocentric model by considering the work of scientists such as Ptolemy, Alhazen and Copernicus.		

SUMMER	Scientific Knowledge		Working Scientifically	Year Five Expectations
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. - explore falling objects and raise questions about the effects of air resistance. - explore the effects of air resistance by observing how different objects such as parachutes and sycamore seeds fall. - experience forces that make things begin to move, get faster or slow down - explore the effects of friction on movement and find out how it slows or stops moving objects, for example, by observing the effects of a brake on a bicycle wheel. - explore the effects of levers, pulleys and simple machines on movement - find out how scientists, for example, Galileo Galilei and Isaac Newton helped to develop the theory of gravitation.		Plan scientific enquiry to answer question and recognise and control variables where necessary Report and present findings from enquiries, including conclusions, causal relationships and explanations of degree of trust in results, in oral and written forms such as displays and other presentations Measure, using a range of equipment and taking repeat readings	✓ Select from practical resources to gather evidence to answer their questions. ✓ Carry out fair tests, recognising and controlling variables. ✓ Decide what observations or measurements to make over time and for how long. Look for patterns and relationships using a suitable sample. ✓ Communicate their findings to an audience using relevant scientific language and illustrations. ✓ Record the results of a survey using a classification key ✓ Record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys. ✓ In their conclusions: identify causal relationships and patterns in the natural world from their evidence Evaluate, for example, the choice of method used, the control of variables ✓ 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, 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)
Scientists and Inventors	<i>Choose at least two scientists/inventors to look at in detail (see Science and Inventors progression overview for possible objectives).</i>		Gather and record data using tables and graphs Identifying scientific evidence that has been used to support or refute ideas or arguments.	✓ 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. ✓ 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. ✓ Answer their own and others' questions based on observations they have made; measurements they have taken or information they have gained from secondary sources.



YEAR 6

*note red are END of Key Stage objectives

AUTUMN	Scientific Knowledge		Working Scientifically	Year Six Expectations
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. - introduced to the idea that broad groupings, such as micro-organisms, plants and animals can be subdivided. - Through direct observations where possible, they should classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals). - discuss reasons why living things are placed in one group and not another. - find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification.		Plan scientific enquiry to answer question and recognise and control variables where necessary	- Select from a wide range of practical resources to gather evidence to answer their questions. - They carry out fair tests, recognising and controlling variables. - Decide what observations or measurements to make over time and for how long, giving a rationale for this. - Look for patterns and relationships using a suitable sample. 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. Decide for themselves how to gather evidence to answer a scientific question. Choose a type of enquiry to carry out and justify their choice. Recognise how secondary sources can be used to answer questions that cannot be answered through practical work.
			Report and present findings from enquiries, including conclusions, causal relationships and explanations of degree of trust in results, in oral and written forms such as displays and other presentations	- Communicate their findings to an audience using relevant scientific language and illustrations. - Record the results of a survey using a classification key - Record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys. - In their conclusions: identify causal relationships and patterns in the natural world from their evidence Present the same data in different ways in order to help with answering questions. Identify results that do not fit the overall pattern; and explain their findings using their subject knowledge. 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. Identify any limitations that reduce the trust they have in their data.
			Measure, using a range of equipment and taking repeat readings	- Select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale and give a rationale as to why they are being used. - During an enquiry, 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).
Animals including humans	- identify and name the main parts of the human circulatory system, - 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. - explore and answer questions that help them to understand how the circulatory system enables the body to function. - learn how to keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body.		Gather and record data using tables and graphs	- Decide how to record and present evidence in the most appropriate way. - Record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. - Record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. - Record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys. Present the same data in different ways in order to help with answering the question.
			Identifying scientific evidence that has been used to support or refute ideas or arguments.	- 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. Talk about how their scientific ideas change due to new evidence that they have gathered. Talk about how new discoveries change scientific understanding.

SPRING	Scientific Knowledge		Working Scientifically	Year Six Expectations
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		Plan scientific enquiry to answer question and recognise and control variables where necessary	- Select from a wide range of practical resources to gather evidence to answer their questions. - They carry out fair tests, recognising and controlling variables.

	• 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. • introduced to the idea that characteristics are passed from parents to their offspring • appreciate that variation in offspring over time can make animals more or less able to survive in particular environments			✓ Decide what observations or measurements to make over time and for how long, giving a rationale for this. ✓ Look for patterns and relationships using a suitable sample. ✓ 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. ✓ Decide for themselves how to gather evidence to answer a scientific question. ✓ Choose a type of enquiry to carry out and justify their choice. Recognise how secondary sources can be used to answer questions that cannot be answered through practical work.
			Report and present findings from enquiries, including conclusions, causal relationships and explanations of degree of trust in results, in oral and written forms such as displays and other presentations	✓ Communicate their findings to an audience using relevant scientific language and illustrations. ✓ Record the results of a survey using a classification key ✓ Record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys. ✓ In their conclusions: identify causal relationships and patterns in the natural world from their evidence ✓ Present the same data in different ways in order to help with answering questions. ✓ Identify results that do not fit the overall pattern; and explain their findings using their subject knowledge. ✓ 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. Identify any limitations that reduce the trust they have in their data.
			Measure, using a range of equipment and taking repeat readings	✓ Select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale and give a rationale as to why they are being used. During an enquiry, 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).
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. • exploring the way that light behaves, including light sources, reflection and shadows. Pupils should talk about what happens and make predictions.		Gather and record data using tables and graphs	✓ Decide how to record and present evidence in the most appropriate way. ✓ Record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. ✓ Record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. ✓ Record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys. Present the same data in different ways in order to help with answering the question.
			Identifying scientific evidence that has been used to support or refute ideas or arguments.	✓ 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. Talk about how their scientific ideas change due to new evidence that they have gathered. Talk about how new discoveries change scientific understanding.

SUMMER	Scientific Knowledge		Working Scientifically	Year Six Expectations
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. • construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors.		Plan scientific enquiry to answer question and recognise and control variables where necessary	✓ Select from a wide range of practical resources to gather evidence to answer their questions. ✓ They carry out fair tests, recognising and controlling variables. ✓ Decide what observations or measurements to make over time and for how long, giving a rationale for this. ✓ Look for patterns and relationships using a suitable sample. ✓ 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. ✓ Decide for themselves how to gather evidence to answer a scientific question. ✓ Choose a type of enquiry to carry out and justify their choice. ✓ Recognise how secondary sources can be used to answer questions that cannot be answered through practical work.

			Report and present findings from enquiries, including conclusions, causal relationships and explanations of degree of trust in results, in oral and written forms such as displays and other presentations	✓ Communicate their findings to an audience using relevant scientific language and illustrations. ✓ Record the results of a survey using a classification key ✓ Record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys. ✓ In their conclusions: identify causal relationships and patterns in the natural world from their evidence ✓ Present the same data in different ways in order to help with answering questions. ✓ Identify results that do not fit the overall pattern; and explain their findings using their subject knowledge. ✓ 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. ✓ Identify any limitations that reduce the trust they have in their data.
			Measure, using a range of equipment and taking repeat readings	✓ Select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale and give a rationale as to why they are being used. During an enquiry, 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).
Scientists and Inventors	<i>Choose at least two scientists/inventors to look at in detail (see Science and Inventors progression overview for possible objectives).</i>		Gather and record data using tables and graphs	✓ Decide how to record and present evidence in the most appropriate way. ✓ Record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. ✓ Record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. ✓ Record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys. ✓ Present the same data in different ways in order to help with answering the question.
			Identifying scientific evidence that has been used to support or refute ideas or arguments.	✓ 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. ✓ Talk about how their scientific ideas change due to new evidence that they have gathered. Talk about how new discoveries change scientific understanding.