Science Skills Progression – KS1 and KS2

Checked by School Leader/l Key Stage Leader	***Name/ Signature/ Date:***
Checked by School Curriculum Leader	***Name/ Signature/ Date:***

Monitoring	Each individual school is responsible for ensuring the delivery of the National Curriculum 14 intentions within the school. The school is required to regularly monitor the delivery of this Vertical Skills Progression Map. The school must complete an annual review of its School Vertical Progression Map to check the implementation of curriculum skills. Ongoing monitoring of planning, learning evidence and pupil knowledge will take place as part of good practice by subject and school leaders. Information from monitoring will be used to inform in school/ MAT CPD subject training.
Curriculum Statement **National Curriculum 2014**	**Purpose of Study** A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes. **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 **Scientific knowledge and conceptual understanding** The programmes of study describe a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage. Insecure, superficial understanding will not allow genuine progression: pupils may struggle at key points of transition (such as between primary and secondary school), build up serious misconceptions, and/or have significant difficulties in understanding higher-order content. Pupils should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary. They should also apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data. The social and economic implications of science are important but, generally, they are taught most appropriately within the wider school curriculum: teachers will wish to use different contexts to maximise their pupils' engagement with

	and motivation to study science. **The nature, processes and methods of science** 'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group. It should not be taught as a separate strand. The notes and guidance give examples of how 'working scientifically' might 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 observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data. 'Working scientifically' will be developed further at key stages 3 and 4, once pupils have built up sufficient understanding of science to engage meaningfully in more sophisticated discussion of experimental design and control. **Spoken language** The national curriculum for science reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. They must be assisted in making their thinking clear, both to themselves and others, and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions. **School curriculum** The programmes of study for science are set out year-by-year for key stages 1 and 2. Schools are, however, only required to teach the relevant programme of study by the end of the key stage. **Within each key stage, schools therefore have the flexibility to introduce content earlier or later than set out in the programme of study. In addition, schools can introduce key stage content during an earlier key stage if appropriate**. All schools are also required to set out their school curriculum for science on a year-by-year basis and make this information available online. **Assessment** By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study

Key Stage 1
The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to 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. They should begin to 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. Most of the learning about science should be done through the 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 described separately in the programme of study but must always be taught through and clearly related to the teaching of substantive science content in the programme of study. Throughout the notes/guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

National Curriculum 2014 Key Stage 1	
Learning Intentions Pupils should be taught about:	Non-Statutory
During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: ▪ 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.	Pupils in years 1 and 2 should explore the world around them and raise their own questions. They should experience different types of scientific enquiries, including practical activities, and begin to recognise ways in which they might answer scientific questions. They should use simple features to compare objects, materials and living things and, with help, decide how to sort and group them, observe changes over time, and, with guidance, they should begin to notice patterns and relationships. They should ask people questions and use simple secondary sources to find answers. They should use simple measurements and equipment (for example, hand lenses, egg timers) to gather data, carry out simple tests, record simple data, and talk about what they have found out and how they found it out. With help, they should record and communicate their findings in a range of ways and begin to use simple scientific language. These opportunities for working scientifically should be provided across years 1 and 2 so that the expectations in the programme of study can be met by the end of year 2. ▪ Pupils are not expected to cover each aspect for every area of study.

A. Working Scientifically - Learning Progression Year 1				
Planning Investigations (Y1)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils can ask questions	*Ask simple questions when prompted*	Pupil can understand that questions can be answered by testing.	Pupil can, with prompting, ask simple questions that can be tested, e.g. about plants growing in their habitat.	Pupil can ask simple questions that can be tested.
Pupils can plan an enquiry	*Suggest ways of answering a question*	Pupil can, with prompting, offer way of gathering evidence to answer a question.	Pupil can offer ways of gathering evidence to answer a question, e.g. by deciding on the best material to use for a	Pupil can suggest different ways of answering question.

			particular application.	
Conducting Investigation (Y1)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils can use equipment to take measurements	*Make relevant observations*	Pupil can examine objects, when prompted.	Pupil can examine objects to note key features, e.g. observe growth of plants they have planted.	Pupil can examine carefully, e.g. using hand lens.
	Conduct simple tests, with support	Pupil can recognise a simple scientific test.	Pupil can, with support, conduct simple tests, e.g. comparing the properties of different materials.	Pupil can conduct simple tests.
Recording Evidence (Y1)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils record work with diagrams and label them	*With prompting, suggest how findings could be recorded*	Pupil can recognise the purpose of an experiment.	Pupil can, with prompting, identify what might usefully be recorded, e.g. drawing structures of plants or recording changing day length.	Pupil can, with assistance, draw and label diagrams.
	Pupils process findings to develop conclusions and identify causal relationships	Recognise findings	Pupil can, with prompting, identify key findings from an enquiry.	Pupil can identify key findings from an enquiry, e.g. noting how plants have changed over time.
Conclusions/Predictions (Y1)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils can analyse data	*Gather and record data*	Pupil can collect data, when prompted.	Pupil can collect data, e.g. comparing and contrasting familiar plants.	Pupil can collect data relevant to the answering of questions.
Pupils can draw conclusions	*Use observations to suggest answers to questions*	Pupil can. with prompting, suggest answers to enquiry questions using data.	Pupil can suggest answers to enquiry questions using data, e.g. describe how to group plants.	Pupil can answer enquiry questions using data and ideas.

Science Content – National Curriculum 2014 Year 1	
Pupils should be taught about:	Non-Statutory
Biology Plants ▪ identify and name a variety of common wild and garden plants, including deciduous and evergreen trees ▪ identify and describe the basic structure of a variety of common flowering	▪ Pupils should use the local environment throughout the year to explore and answer questions about plants growing in their habitat. ▪ Where possible, they should observe the growth of flowers and vegetables

plants, including trees.	that they have planted. ▪ They should become familiar with common names of flowers, examples of deciduous and evergreen trees, and plant structures (including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem). ▪ **Pupils might work scientifically by** observing closely, perhaps using magnifying glasses, and comparing and contrasting familiar plants; describing how they were able to identify and group them, and drawing diagrams showing the parts of different plants including trees. Pupils might keep records of how plants have changed over time, for example the leaves falling off trees and buds opening; and compare and contrast what they have found out about different plants.
Biology 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.	▪ Pupils should use the local environment throughout the year to explore and answer questions about animals in their habitat. ▪ They should understand how to take care of animals taken from their local environment and the need to return them safely after study. ▪ Pupils should become familiar with the common names of some fish, amphibians, reptiles, birds and mammals, including those that are kept as pets. ▪ Pupils should have plenty of opportunities 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. ▪ **Pupils might work scientifically by** using their observations to compare and contrast animals at first hand or through videos and photographs, describing how they identify and group them; grouping animals according to what they eat; and using their senses to compare different textures, sounds and smells
Chemistry Every-day 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.	▪ Pupils should 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. ▪ Pupils should explore and experiment with a wide variety of materials, not only those listed in the programme of study, but including for example: brick, paper, fabrics, elastic, foil. ▪ **Pupils might work scientifically by:** performing simple tests to explore questions, for example: 'What is the best material for an umbrella? ...for

	lining a dog basket. ...for curtains? ...for a bookshelf? ...for a gymnast's leotard?'
Physics Seasonal Changes ▪ observe changes across the four seasons ▪ observe and describe weather associated with the seasons and how day length varies.	▪ Pupils should observe and talk about changes in the weather and the seasons. Note: Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. ▪ **Pupils might work scientifically by** making tables and charts about the weather; and making displays of what happens in the world around them, including day length, as the seasons change.

B. Science Content - Learning Progression
Year 1

Biology - Plants (Y1)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Life exists in a variety of forms and goes through cycles	*Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees*	Identify and name a limited range of plants.	Identify a range of local plants.	Identify and notice similarities between various local plants.
	Identify and describe the basic structure of a variety of common flowering plants, including trees	Identify and describe the basic structure of a common flowering plant.	Name parts of a range of familiar plants.	Identify and notice similarities in the structure of various local plants.
	Explore and compare the differences between things that are living, dead, and things that have never been alive	Sort items into 'once living' and 'never lived'.	Compare/contrast a collection of items, sorting into categories 'living', 'dead' and 'things that have never been alive'.	Research further examples to add to the categories: 'living', 'dead' and 'things that have never been alive'.
Biology – Animals (Y1)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Life exists in a variety of forms and goes through cycles	*Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals*	Identify and name a limited number of common animals.	Name a variety of common animals.	Identify common features of the main groups of vertebrates.
	Identify and name a variety of common animals that are carnivores, herbivores and omnivores	Recognise the difference between carnivores, herbivores and omnivores.	Identify and group a range of familiar animals.	Suggest whether an unfamiliar animal might be a carnivore, herbivore or omnivore.
Biology – Human Body (Y1)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
The human body has a number of systems, each with its own	*Describe and compare the structure of a variety of*	Identify key features of one or two common animals.	Identify key features of a range of common animals.	Compare key features of familiar and unfamiliar animals.

function	*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	Describe each of the human senses.	Relate each of the human senses to organs.	Suggest how the senses are used in an activity such as eating.
Chemistry – Materials (Y1)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Materials have physical properties which can be investigated and compared	*Distinguish between an object and the material from which it is made*	Identify the material from which an object has been made.	Correctly identify both object and material.	Compare the same object made from different materials in terms of its effectiveness.
	Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock	Identify and name a limited range of materials.	Identify and name a range of materials.	Identify typical uses of a range of materials.
	Describe the simple physical properties of a variety of everyday materials	Recognise that a material has properties.	Describe a range of properties of a variety of materials.	Compare the physical properties of different everyday materials.
	Compare and group together a variety of everyday materials on the basis of their simple physical properties	Compare and contrast two everyday materials.	Classify a variety of materials into groups based on physical properties.	Use simple physical properties to suggest classification of materials
Physics–Seasonal Changes (Y1)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Day, night, month, seasonal change & year are caused by the position/movement of the Earth	*Observe changes across the four seasons*	Recognise that there are seasonal changes.	Describe seasonal changes.	Recognise changes within seasons as well as between seasons.
	Observe/describe weather associated with the seasons and how day length varies	Recognise that day length alters in different seasons. .	Relate weather patterns and day length to seasons.	Make and test predictions relating to changing day length and weather patterns
A. Working Scientifically - Learning Progression Year 2				
Planning Investigations (Y2)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils can ask questions	*Ask simple questions*	Pupil can, with prompting, ask simple questions that can be	Pupil can ask simple questions that can be tested, e.g. about	Pupil can, with support, develop relevant, testable questions.

		tested.	the local environment and how organisms depend on each other.	
Pupils can plan an enquiry	*Recognise that questions can be answered in different ways*	Pupil can offer way of gathering evidence to answer a question.	Pupil can suggest different ways of answering a question, e.g. testing the suitability of materials for different purposes.	Pupil can plan enquiry, such as a comparative or fair test.
Conducting Experiments (Y2)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils can use equipment to take measurements	*Observe closely using simple equipment.*	Pupil can examine objects closely, e.g. pebbles.	Pupil can examine carefully, e.g. using a hand lens.	Pupil can observe carefully and suggest useful measurements, e.g. examine a leaf and suggest measuring its length.
	Perform simple tests	Pupil can, with support, conduct simple tests.	Pupil can conduct simple tests, e.g. setting up comparative tests to show that plants need water and light.	Pupil can conduct a series of simple tests.
Recording Evidence (Y2)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils record work with diagrams and label them	*Record and communicate their findings in a range of ways and begin to use simple scientific language*	Pupil can, with prompting, identify what might usefully be recorded.	Pupil can, with assistance, draw and label diagrams, e.g. recording plants changing over time, starting from seed/ bulb.	Pupil can, with prompting, draw and label diagrams.
Reporting Findings (Y2)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils process findings to develop conclusions and identify causal relationships	*Identify and classify*	Pupil can identify key findings from an enquiry.	Pupil can identify and group key outcomes from enquiry, e.g. describing conditions in different habitats and how these affect the numbers and types of organisms.	Pupil can, with prompting, suggest what an enquiry shows.
Conclusions/Predictions (Y2)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils can analyse data	*Gather and record data to help answer questions*	Pupil can collect data.	Pupil can collect data relevant to the answering of questions, e.g. seeing how the shapes of some materials can be changed.	Pupil can recognise patterns that relate to scientific ideas, when prompted.

Pupils can draw conclusions	*Use their observations and ideas to suggest answers to questions*	Pupil can suggest answers to enquiry questions using data.	Pupil can answer enquiry questions using data and ideas, e.g. to help decide how the properties of certain materials make them suitable for certain applications.	Pupil can, with support, use evidence to produce simple conclusion.

Science Content – National Curriculum 2014 **Year 2**	
Pupils should be taught about:	Non-Statutory
Biology Living Things and Their Habitats ▪ explore and compare the differences between things that are living, dead, and things that have never been alive ▪ identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other ▪ identify and name a variety of plants and animals in their habitats, including microhabitats ▪ describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.	▪ Pupils should be introduced to the idea that all living things have certain characteristics that are essential for keeping them alive and healthy. ▪ They should raise and answer questions that help them to become familiar with the life processes that are common to all living things. ▪ Pupils should be introduced to 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). ▪ They should 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. ▪ Pupils should 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. ▪ **Pupils might work scientifically by** sorting and classifying things according to whether they are living, dead or were never alive, and recording their findings using charts. They should describe how they decided where to place things, exploring questions for example: 'Is a flame alive? Is a deciduous tree dead in winter?' and talk about ways of answering their questions. They could construct a simple food chain that includes humans (e.g. grass, cow, human). They could describe the conditions in different habitats and micro-habitats (under log, on stony path, under bushes) and find out how the conditions affect the number and type(s) of plants and animals that live there.
Biology Plants ▪ observe and describe how seeds and bulbs grow into mature plants	▪ Pupils should use the local environment throughout the year to observe how different plants grow.

▪ find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	▪ Pupils should be introduced to the requirements of plants for germination, growth and survival, as well as to the processes of reproduction and growth in plants. Note: Seeds and bulbs need water to grow but most do not need light; seeds and bulbs have a store of food inside them. ▪ **Pupils might work scientifically by** observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb or observing similar plants at different stages of growth; setting up a comparative test to show that plants need light and water to stay healthy.
Biology Animals Including Humans ▪ notice that animals, including humans, have offspring which grow into adults ▪ find out about and describe the basic needs of animals, including humans, for survival (water, food and air) ▪ describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	▪ Pupils should be introduced to the basic needs of animals for survival, as well as the importance of exercise and nutrition for humans. ▪ They should also be introduced to the processes of reproduction and growth in animals. ▪ 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. ▪ **Pupils might work scientifically by** observing, through video or first-hand observation and measurement, how different animals, including humans, grow; asking questions about what things animals need for survival and what humans need to stay healthy; and suggesting ways to find answers to their questions.
Chemistry Uses of Everyday Materials ▪ identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses ▪ find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	▪ Pupils should 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 (metal can be used for coins, cans, cars and table legs; wood can be used for matches, floors, and telegraph poles) or different materials are used for the same thing (spoons can be made from plastic, wood, metal, but not normally from glass). ▪ They should think about 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. ▪ Pupils might find out about people who have developed useful new materials, for example John Dunlop, Charles Macintosh or John McAdam. ▪ **Pupils might work scientifically by** comparing the uses of everyday

		materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs); observing closely, identifying and classifying the uses of different materials, and recording their observations.		
B. Science Content - Learning Progression Year 2				
Biology - Living Things and their Habitats, Plants, Animals including Humans (Y2)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Habitats provide living things with what they need	*Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other*	Identify that a habitat supplies living things with what they need.	Explain how, for a named animal or plant, it gets what it needs from its habitat and other living things that are there.	Explain why there may be a limit as to how many of a certain living thing can live in a particular area.
	Identify and name a variety of plants and animals in their habitats, including micro habitats	Identify a limited range of living things in their habitats.	Identify a range of living things in habitats of various sizes.	Identify a range of living things and suggest why they may be found in that habitat.
	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	Identify a predator–prey relationship.	Construct a simple food chain and identify what is eating what.	Suggest, within a simple food chain, what might happen if one of the living things becomes scarce.
	Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy	Find out one thing that plants need to grow and stay healthy.	Explore and identify what plants need to thrive.	Identify the effects of a shortage of each of the things that plants need to grow and stay healthy
Life exists in a variety of forms and goes through cycles – Plants	*Observe and describe how seeds and bulbs grow into mature plants*	Identify that seeds and bulbs grow into mature plants.	Describe stages of development of a full-grown plant.	Compare and contrast the growth patterns of different types of plants.
Life exists in a variety of forms and goes through cycles –	*Notice that animals, including humans, have offspring which*	Recognise that all animals, including humans, have	Describe the relationship between adult animals and	Compare and contrast adults and their offspring for different

Animals	*grow into adults*	offspring.	their offspring.	animals.
	Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)	Identify the basic needs of animals, including humans, for survival (water, food and air). .	Identify human's basic needs.	Suggest how the basic needs of different animals influences their choice of habitat.
The human body has a number of systems, each with its own function	*Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene*	Recognise the importance to humans of exercise, diet and hygiene.	Describe the importance of a healthy diet and exercise.	Suggest effects of poor diet and hygiene.
Chemistry - Uses of Everyday Materials (Y2)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Materials have physical properties which can be investigated and compared	*Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching*	Identify that the shape of some objects can be changed.	Describe changes achieved by applying forces in different directions.	Identify that some changes to shapes are permanent and others are temporary, and that this can influence their uses.
The physical properties of materials determine their uses	*Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses*	Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.	Select and justify a material for a particular use.	For particular materials in particular uses, identify limitations as well as suitability.
N.B. No Physics Covered in N/C in Year 2 however schools may have chosen to add Physics into Year 2 to secure progression across the school e.g. light and sound/ electricity/ forces and movement				

Lower Key Stage 2

The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should 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. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

'Working scientifically' is described separately at the beginning of the programme of study but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

National Curriculum 2014 Working Scientifically – Learning Progression Lower Key Stage 2	
Learning Intentions Pupils should be taught about	Non-Statutory
During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: ▪ asking relevant questions and using different types of scientific enquiries to answer them ▪ setting up simple practical enquiries, comparative and fair tests ▪ making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers ▪ gathering, recording, classifying and presenting data in a variety of ways to help in answering questions ▪ recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables ▪ reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ▪ using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions ▪ identifying differences, similarities or changes related to simple scientific ideas and processes ▪ using straightforward scientific evidence to answer questions or to support their findings.	▪ Pupils in years 3 and 4 should be given a range of scientific experiences to enable them to raise their own questions about the world around them. ▪ They should start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help to decide how to set it up; talk about criteria for grouping, sorting and classifying; and use simple keys. ▪ They should begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them. ▪ They should help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. ▪ They should learn how to use new equipment, such as data loggers, appropriately. ▪ They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. ▪ With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. ▪ With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done. ▪ They should also recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. ▪ Pupils should use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences. ▪ These opportunities for working scientifically should be provided across years 3 and 4 so that the expectations in the programme of study can be met by the end of year 4. Pupils are not expected to cover each aspect for

	every area of study.

A. Working Scientifically - Learning Progression Year 3				
Planning Investigations (Y3)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils ask questions	*Ask relevant questions when prompted*	Pupil can ask simple questions that can be tested.	Pupil can, with support, develop relevant, testable questions, e.g. what happens to shadows when the light source moves.	Pupil can develop relevant, testable questions.
Pupils can plan an enquiry	*Set up simple and practical enquiries, comparative and fair tests*	Pupil can suggest different ways of answering question.	Pupil can plan enquiry, such as comparative or fair test, e.g. comparing the effect of different factors on plant growth.	Pupil can plan investigations using different types of scientific enquiry.
Pupils can identify and manage variables	*Set up comparative tests*	Pupil can, with support, set up a comparative test.	Pupil can set up a comparative test, e.g. how far things move on different surfaces.	Pupil can set up comparative and fair tests.
Conducting Experiments (Y3)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils can use equipment to take measurements	*Make systematic observations, using simple equipment*	Pupil can use various equipment, with assistance, e.g. a thermometer.	Pupil can use various equipment, as instructed, e.g. using a hand lens to examine rocks.	Pupil can use various equipment, as instructed, repeatedly and with care.
Pupils explore how to improve the quality of data	*Use standard units when taking measurements*	Pupil can recognise some standard measurements, e.g. cm.	Pupil can use standard measurements when taking measurements, e.g. measuring distances between a light source and an object.	Pupil can recognise the importance of using standard units.
Recording Evidence (Y3)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils record work with diagrams and label them	*Record findings in various ways*	Pupil can, with assistance, draw and label diagrams.	Pupil can, with prompting, draw and label diagrams, e.g. to show how water travels in a plant.	Pupil can use words and diagrams to record findings.
Pupils can display data using labelled diagrams, keys, tables and bar charts	*With prompting, suggest how findings may be tabulated*	Pupil can recognise the function of a table.	Pupil can, with prompting, use tables to record evidence, e.g. recording what happens when	Pupil can use various ways to record evidence.

			various rocks are rubbed together.	
Pupils can display data using line graphs	*With prompting, use various ways of recording, grouping and displaying evidence*	Pupil can recognise different ways of gathering and displaying evidence.	Pupil can, with prompting, gather and display evidence in various ways, e.g. about the ways that magnets behave in relation to each other.	Pupil can use various ways to record, group and display evidence.
Reporting Findings (Y3)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils process findings to develop conclusions and identify causal relationships	*With prompting, suggest conclusions from enquiries*	Pupil can, with prompting, suggest what enquiry shows.	Pupil can, with prompting, write a conclusion based on evidence, e.g. exploring the strengths of different magnets.	Pupil can write a conclusion based on evidence.
Pupils use displays and presentations to report on findings	*Suggest how findings could be reported*	Pupil can, with support, indicate findings from an enquiry that could be reported.	Pupil can indicate findings from an enquiry that could be reported, e.g. answering questions about how rocks are formed.	Pupil can present findings either in writing or orally.
Conclusions/Predictions (Y3)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils can analyse data	*Gather and record data about similarities, differences and changes*	Pupil can collect data relevant to the answering of questions.	Pupil can, with prompting, recognise patterns that relate to scientific ideas, e.g. investigating the behaviour of magnets.	Pupil can recognise patterns that relate to scientific ideas.
Pupils can draw conclusions	*With prompting, suggest conclusions that can be drawn from data*	Pupil can answer enquiry questions using data and ideas.	Pupil can, with support, use evidence to produce a simple conclusion, e.g. changes that occur when rocks are in water.	Pupil can use evidence to produce a simple conclusion.
Pupils can develop investigation further	*Suggest possible improvements or further questions to investigate*	Pupil can with prompting, suggest how an investigation could be extended.	Pupil can suggest how an investigation could be extended, e.g. suggesting creative uses for different magnets.	Pupil can use evidence to suggest further relevant investigations.

Science Content – National Curriculum 2014 Year 3	
Learning Intentions Pupils should be taught about	Non-Statutory

Biology Plants ▪ identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers ▪ explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant ▪ investigate the way in which water is transported within plants ▪ explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	▪ Pupils should be introduced to the relationship between structure and function: the idea that every part has a job to do. ▪ They should explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction. Note: Pupils can be introduced to the idea that plants can make their own food, but at this stage they do not need to understand how this happens. ▪ **Pupils might work scientifically by:** comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser; discovering how seeds are formed by observing the different stages of plant life cycles over a period of time; looking for patterns in the structure of fruits that relate to how the seeds are dispersed. They might observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers.
Biology 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.	▪ Pupils should continue to learn about the importance of nutrition and should be introduced to the main body parts associated with the skeleton and muscles, finding out how different parts of the body have special functions. ▪ **Pupils might work scientifically by** identifying and grouping animals with and without skeletons and observing and comparing their movement; exploring ideas about what would happen if humans did not have skeletons. They might compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat. They might research different food groups and how they keep us healthy and design meals based on what they find out.
Chemistry 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.	▪ Linked with work in geography, pupils should explore different kinds of rocks and soils, including those in the local environment. ▪ **Pupils might work scientifically by** observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time; using a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them. Pupils might research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed. Pupils could explore different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together or what

	changes occur when they are in water. They can raise and answer questions about the way soils are formed.
Physics 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.	▪ Pupils should 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. ▪ They should think about why it is important to protect their eyes from bright lights. ▪ They should look for, and measure, shadows, and find out how they are formed and what might cause the shadows to change. Note: Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. ▪ **Pupils might work scientifically by** looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.
▪ **Physics** 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.	▪ Pupils should observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary (for example, opening a door, pushing a swing). ▪ They should explore the behaviour and everyday uses of different magnets (for example, bar, ring, button and horseshoe). ▪ **Pupils might work scientifically by:** comparing how different things move and grouping them; raising questions and carrying out tests to find out how far things move on different surfaces and gathering and recording data to find answers their questions; exploring the strengths of different magnets and finding a fair way to compare them; sorting materials into those that are magnetic and those that are not; looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another; identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets.

B. Science Content - Learning Progression
Year 3

Biology - Plants (Y3)	Progression Statement	Working Towards	Working At	Working Beyond
Habitats provide living things with what they need	*Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how*	Suggest how one of the requirements for plants to stay healthy could be explored.	Explain what all plants need to flourish and recognise how these requirements vary in amount.	Compare the requirements of different plants and link these to particular habitats.

	they vary from plant to plant			
Life exists in a variety of forms and goes through cycles – Plants	*Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers*	Identify different parts of a flowering plant: roots, stem/trunk, leaves and flowers.	Describe what each part of a flowering plant does.	Suggest why parts may vary in size and shape from one species of flowering plant to another.
	Investigate the way in which water is transported within plants	Identify that water is transported within plants.	Explain, with the aid of a diagram or plant, how water is carried up from the soil.	Suggest how this process might vary from one type of plant to another.
	Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	Describe the processes of pollination, seed formation and seed dispersal.	Explain how pollination, seed formation and seed dispersal play a role in the reproduction of flowering plants.	Suggest why pollination, seed formation and seed dispersal may vary from one type of plant to another.
Biology - Animals including Humans (Y3)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Life exists in a variety of forms and goes through cycles – Animals	*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 animals, including humans, need the correct nutrition.	Describe why animals depend on the correct nutrition.	Explain why a varied diet is important.
The human body has a number of systems, each with its own function	*Identify that humans and some other animals have skeletons and muscles for support, protection and movement*	Recognise that humans and some other animals have skeletons and muscles.	Explain which parts of the skeleton provide support and protection, and how they allow for movement.	Compare the ways that the skeletons of different animals provide support, protection and movement.
Chemistry – Rocks (Y3)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Different rocks have different properties and the formation of soil & fossils can be explained	*Describe in simple terms how fossils are formed when things that have lived are trapped within rock*	Understand that fossils indicate the shape of previous life forms.	Explain how fossils are formed.	Explain the importance of studying fossils.
	Recognise that soils are made from rocks and organic matter	Describe the appearance of soil, recognising that it is a mixture of materials.	Describe how soil is made.	Compare different soils in terms of composition.
Materials have physical properties which can be	*Compare and group together different kinds of rocks on the*	Identify that rocks vary in terms of appearance and physical	Examine and test rocks, grouping them according to the	Suggest uses for different kinds of rocks based on their

investigated and compared	*basis of their appearance and simple physical properties*	properties.	results.	properties.
Physics – Forces (Y3)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
There are contact and non-contact forces; these affect the motion of objects	*Compare how things move on different surfaces*	Recognise that things may move differently on different surfaces.	Compare how an object, such as a toy car, will move on different surfaces.	Predict how an object will move on other surfaces and suggest why.
	Notice that some forces need contact between two objects, but magnetic forces can act at a distance	Recognise that magnetic forces don't require physical contact.	Recognise the difference between contact and contact forces.	Explore how magnetic attraction and repulsion are affected by distance.
	Observe how magnets attract or repel each other and attract some materials and not others	Identify that magnets affect each other.	Describe how magnets attract or repel each other and attract magnetic materials.	Explore whether some magnets are stronger than 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	Recognise that some materials are magnetic and that others are not.	Group materials on the basis of testing for being magnetic.	Identify some applications of magnets and magnetic materials.
	Describe magnets as having two poles	Recognise the term 'magnetic pole'.	Describe and identify the poles of a magnet.	Explore the similarities and differences between the two poles.
	Predict whether two magnets will attract or repel each other, depending on which poles are facing	Recognise that magnets affect each other differently, depending on which poles are facing.	Predict outcomes of a particular arrangement of magnets.	Apply ideas about the interaction of magnets to contexts such as toys.
Physics – Light and Sound (Y3)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Light & sound can be reflected & absorbed and enable us to see & hear	*Recognise that they need light in order to see things and that dark is the absence of light*	Identify that light is necessary for vision.	Relate being able to see to the presence of light.	Recognise that vision involves light travelling to the eyes.
	Notice that light is reflected from surfaces	Identify that mirrors reflect light.	Describe how some objects reflect light.	Recognise that some surfaces are better at reflecting light than other.
	Recognise that light from the sun can be dangerous and that there are ways to protect their	Recognise that light from the sun can be dangerous.	Describe how and why our eyes should be protected from sunlight.	Explain why sunlight can be dangerous and how types of protection works.

	eyes			
	Recognise that shadows are formed when the light from a light source is blocked by a solid object	Recognise that light cannot pass through some objects.	Explain how shadows are made.	Suggest how light is travelling to form a shadow.
	Find patterns in the way that the size of shadows change	Identify that the size of shadows can be changed.	Describe how to change the size of a shadow.	Relate position of an object and position of a screen to the size of the shadow.
A. Working Scientifically - Learning Progression Year 4				
Planning investigations (Y4)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils can ask questions	*Ask relevant questions*	Pupil can, with support, develop relevant, testable questions.	Pupil can develop relevant, testable questions, e.g. based on observations of animals.	Pupil can develop a range of relevant testable questions.
Pupils can plan an enquiry	*Plan different types of scientific enquiries to answer questions*	Pupil can plan enquiries, such as a comparative or fair test.	Pupil can plan investigations using different types of scientific enquiry, e.g. exploring various materials by observing change over time, running comparative tests and conducting surveys.	Pupil can, with support, answer questions using evidence gathered from different types of scientific enquiry.
Pupils can identify and manage variables	*Set up simple and practical enquiries, comparative and fair tests*	Pupil can set up a comparative test.	Pupil can set up comparative and fair tests, e.g. finding patterns in the sounds made by elastic bands of different thicknesses.	Pupil can, with prompting, identify and manage variables.
Conducting Experiments (Y4)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils can use equipment to take measurements	*Make systematic and careful observations using a range of equipment, including thermometers and data loggers*	Pupil can use various equipment, as instructed, e.g. a thermometer.	Pupil can use various equipment, as instructed, repeatedly and with care, e.g. thermometers.	Pupil can select and use various equipment repeatedly and with care, e.g. measuring jug to measure volume, and discuss alternatives.
Pupils explore how to improve the quality of data	*Take accurate measurements using standard units, where appropriate*	Pupil can use standard measurements when taking measurements.	Pupil can recognise the importance of using standard units and measures accurately, e.g. measuring temperature	Pupil can take measurements that are precise as well as accurate.

			when investigating its effect on washing drying.	
Recording Evidence (Y4)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils record work with diagrams and label them	*Record findings using simple scientific language, drawings and labelled diagrams*	Pupil can, with prompting, draw and label diagrams.	Pupil can use words and diagrams to record findings, e.g. how habitats change during the year.	Pupil can start to use labelled diagrams to show more complex outcomes.
Pupils can display data using labelled diagrams, keys, tables and bar charts	*Record findings using keys, bar charts, and tables*	Pupil can, with prompting, use tables to record evidence.	Pupil can use various ways to record evidence, e.g. comparing the teeth of herbivores and carnivores.	Pupil can, with prompting, use various ways to record complex evidence.
Pupils can display data using line graphs	*Gather, record, classify and present data in a variety of ways to help to answer questions*	Pupil can, with prompting, gather and display evidence in various ways.	Pupil can use various ways to record, group and display evidence, e.g. grouping and classifying various materials.	Pupil can use line graph to record basic data.
Reporting Findings (Y4)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils process findings to develop conclusions and identify causal relationships	*Report on findings from enquiries, including oral and written explanations, of results and conclusions*	Pupil can, with prompting, write a conclusion based on evidence.	Pupil can write a conclusion based on evidence, e.g. effect on brightness of bulbs if more cells are added.	Pupil can, with prompting, write a conclusion using evidence and identifying causal links.
Pupils use displays and presentations to report on findings	*Report on findings from enquiries using displays or presentations*	Pupil can indicate findings from an enquiry that could be reported.	Pupil can present findings either in writing or orally, e.g. relating to investigating which materials are conductors.	Pupil can, with support, display and present key findings from enquiries orally and in writing.
Conclusion/Predictions (Y4)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils can analyse data	*Identify differences, similarities or changes related to simple scientific ideas and processes*	Pupil can, with prompting, recognise patterns that relate to scientific ideas.	Pupil can recognise patterns that relate to scientific ideas, e.g. finding out which materials make better earmuffs.	Pupil can arrange data to make clear key characteristics.
Pupils can draw conclusions	*Use straightforward scientific evidence to answer questions or to support their findings*	Pupil can, with support, use evidence to produce a simple conclusion.	Pupil can use evidence to produce a simple conclusion, e.g. the effect of temperature on various substances.	Pupil can show how evidence supports a conclusion.
Pupils can develop investigation further	*Use results to draw simple conclusions, make predictions for new values, suggest*	Pupil can suggest how an investigation could be extended.	Pupil can use evidence to suggest further relevant investigations, e.g. making own	Pupil can suggest further relevant comparative or fair tests.

	improvements and raise further questions		instruments, using ideas about pitch and volume.	

Science Content – National Curriculum 2014 Year 4	
Learning Intentions Pupils should be taught about	Non-Statutory
Biology Living Things and their Habitats ▪ recognise that living things can be grouped in a variety of ways ▪ explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment ▪ recognise that environments can change and that this can sometimes pose dangers to living things.	▪ Pupils should use the local environment throughout the year to raise and answer questions that help them to identify and study plants and animals in their habitat. ▪ They should identify how the habitat changes throughout the year. ▪ Pupils should explore possible ways of grouping a wide selection of living things that include animals and flowering plants and non-flowering plants. ▪ Pupils could begin to put vertebrate animals into groups such as fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects. Note: Plants can be grouped into categories such as flowering plants (including grasses) and non-flowering plants, such as ferns and mosses. ▪ Pupils should 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. ▪ **Pupils might work scientifically by** using and making simple guides or keys to explore and identify local plants and animals; making a guide to local living things; raising and answering questions based on their observations of animals and what they have found out about other animals that they have researched.
Biology 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.	▪ Pupils should be introduced to the main body parts associated with the digestive system, for example, mouth, tongue, teeth, oesophagus, stomach and small and large intestine and explore questions that help them to understand their special functions. ▪ **Pupils might work scientifically by** comparing the teeth of carnivores and herbivores and suggesting reasons for differences; finding out what damages teeth and how to look after them. They might draw and discuss their ideas about the digestive system and compare them with models or images.
Chemistry States of Matter	▪ Pupils should explore a variety of everyday materials and develop simple

▪ 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.	descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). ▪ Pupils should observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled. Note: Teachers should avoid using materials where heating is associated with chemical change, for example, through baking or burning. ▪ **Pupils might work scientifically by** grouping and classifying a variety of different materials; exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party). They could research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid. They might observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line and investigate the effect of temperature on washing drying or snowmen melting.
Physics 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.	▪ Pupils should explore and identify the way sound is made through vibration in a range of different musical instruments from around the world; and find out how the pitch and volume of sounds can be changed in a variety of ways. ▪ **Pupils might work scientifically by** finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses. They might make earmuffs from a variety of different materials to investigate which provides the best insulation against sound. They could make and play their own instruments by using what they have found out about pitch and volume
Physics 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	▪ Pupils should construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their circuits to create simple devices. ▪ Pupils should draw the circuit as a pictorial representation, not necessarily using conventional circuit symbols at this stage; these will be introduced in year 6. Note: Pupils might use the terms current and voltage, but these should not be introduced or defined formally at this stage. ▪ Pupils should be taught about precautions for working safely with electricity. ▪ **Pupils might work scientifically by** observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be

		conductors of electricity, and that some materials can, and some cannot be used to connect across a gap in a circuit.		
B. Science Content - Learning Progression Year 4				
Biology - Biology Living Things and their Habitats (Y4)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Living things can be classified according to observable features	*Recognise that living things can be grouped in a variety of ways*	Suggest a way of grouping living things, e.g. sort shells by colour.	Suggest different ways of sorting the same group of living things, e.g. grouping birds according to where they live, what they eat and size of adults.	Suggest why some ways of grouping living things may be more useful than others, e.g. why grouping by number of legs is an easy aid to identification.
	Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment	Use classification keys to group and identify members from a small group of living things.	Use classification keys to group and identify members from a range of familiar and less familiar living things.	Devise own classification keys to group living things.
Habitats provide living things with what they need	*Recognise that environments can change and that this can sometimes pose dangers to living things.*	Describe how environments might change.	Describe examples of living things that are threatened by changes to environments, e.g. owls and habitat loss.	Describe examples of living things adapting to environmental change, e.g. urban foxes, and examples of extinction due to environmental change.
Biology - Animals Including Humans (Y4)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
The human body has a number of systems, each with its own function	*Describe the simple functions of the basic parts of the digestive system in humans*	Describe the purpose of the digestive system in humans.	Identify what each of the principal organs in the digestive system do.	Explain why the simple functions of the basic parts of the digestive system in humans are necessary.
	Identify the different types of teeth in humans and their simple functions	Recognise that humans have different types of teeth.	Describe the function of each type of tooth in the human skull.	Explain why humans have different types of teeth.
	Construct and interpret a variety of food chains, identifying producers, predators and prey	Understand the roles of producers, predators and prey.	Use a food chain to represent predator-prey relationships.	Suggest what might happen in a food chain if the population of one of the organisms changes.

Chemistry – States of Matter (Y4)	Progression Statement	Working Towards	Working At	Working Beyond
Materials have physical properties which can be investigated and compared	*Compare and group materials together, according to whether they are solids, liquids or gases*	Recognise the state of matter of different materials.	Group materials according to their state of matter.	Recognise that some materials (e.g. toothpaste) cannot be easily classified as solid. liquid or gas.
Materials can exist in different states and that these states can sometimes be changed	*Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature*	Relate the terms 'evaporation' and 'condensation' to water.	Describe how evaporation and condensation happen in the water cycle, and how temperature affects evaporation.	Apply the relationship between rate of evaporation with temperature to everyday contexts.
	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)	Recognise that materials may change state.	Identify changes of state and research values of degrees Celsius at which changes happen.	Suggest patterns in which kinds of materials change state at higher or lower temperatures.
Physics – Light and Sound (Y4)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Light & sound can be reflected & absorbed and enable us to see & hear	*Identify how sounds are made, associating some of them with something vibrating*	Identify how an object may vibrate.	Explain, with reference to vibrations, how an object makes a sound.	Group sound-making objects in terms of how they make sounds.
	Recognise that vibrations from sounds travel through a medium to the ear	Recognise that the ear detects vibrations.	Describe the role of a medium in the transmission of sound.	Compare the effectiveness of different media in terms of their ability to transmit sound.
	Recognise that sounds get fainter as the distance from the sound source increases	Suggest why some sounds are louder than others.	Describe the effect of moving further from the source of a sound.	Explain with reference to examples how sounds get fainter as the distance from the source increases.
	Find patterns between the pitch of a sound and features of the object that produced it	Recognise that the pitch of a sound can be varied.	Explain with reference to a particular object how the pitch of the sound can be changed.	Identify generic features that cause the pitch of a note to be changed.
	Find patterns between the volume of a sound and the strength of the vibrations that produced it	Recognise that the volume of a sound can be varied.	Explain with reference to a particular object how the volume of the sound can be changed.	Identify generic features that cause the volume of a note to be changed.

Physics – Electricity (Y4)	Progression Statement	Working Towards	Working At	Working Beyond
Electricity can make circuits work and can be controlled to perform useful functions	*Identify common appliances that run on electricity*	Recognise that some appliances run on electricity.	List examples of appliances that run on electricity.	Compare and contrast appliances that run on mains electricity with those that run on batteries.
	Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers	Construct a simple circuit.	Construct a simple circuit and name its components.	Identify the functions of components within a circuit.
	Recognise some common conductors and insulators, and associate metals with being good conductors	Identify metal as a conductor.	Sort materials into conductors and insulators, identifying metals as conductors.	Investigate graphite as a conductor and relate to other materials.
	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	Understand that a complete circuit is needed for a circuit to operate.	Predict whether a particular arrangement of components will result in a bulb lighting.	Explain why certain arrangements will not result in the bulb lighting.
	Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit	Describe the function of a switch.	Predict how the operation of a switch will affect bulbs lighting.	Explain how altering the location of a switch affects the operation of the circuit.

Upper Key Stage 2

The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should 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. Pupils should 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. 'Working and thinking scientifically' is described separately at the beginning of the programme of study but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.
Pupils should read, spell and pronounce scientific vocabulary correctly.

National Curriculum 2014 Working Scientifically Upper Key Stage 2	
Learning Intentions Pupils should be taught about	Non-Statutory
During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: ▪ planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary ▪ taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate ▪ recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs ▪ using test results to make predictions to set up further comparative and fair tests ▪ reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations ▪ identifying scientific evidence that has been used to support or refute ideas or arguments.	▪ Pupils in years 5 and 6 should use their science experiences to: explore ideas and raise different kinds of questions; select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. ▪ They should use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment. ▪ They should make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; choose the most appropriate equipment to make measurements and explain how to use it accurately. ▪ They should decide how to record data from a choice of familiar approaches; look for different causal relationships in their data and identify evidence that refutes or supports their ideas. ▪ They should use their results to identify when further tests and observations might be needed; recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. ▪ They should use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time. ▪ These opportunities for working scientifically should be provided across years 5 and 6 so that the expectations in the programme of study can be met by the end of year 6. Pupils are not expected to cover each aspect for every area of study.

A. Working Scientifically - Learning Progression Year 5				
Planning investigations (Y5)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils can plan an enquiry	*With prompting, plan different types of scientific enquiries to answer questions*	Pupil can plan investigations using different types of scientific enquiry.	Pupil can, with support, can answer questions using evidence gathered from	Pupil can answer questions using evidence gathered from different types of scientific

			different types of scientific enquiry, e.g. comparing life cycles of different plants using change over time, surveys and secondary research.	enquiry.
Pupils can identify and manage variables	*With prompting, recognise and control variables where necessary*	Pupil can set up comparative and fair tests.	Pupil can, with prompting, identifies and manages variables, e.g. when exploring falling paper cones.	Pupil can identify and manage variables.
Conducting Experiments (Y5)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils can use equipment to take measurements	*Select, with prompting, and use appropriate equipment to take readings*	Pupil can, following discussion, follow guidance to use equipment, e.g. timer.	Pupil can, following discussion of alternatives, selects appropriate equipment, e.g. using a shadow stick and measuring length and angle of shadow.	Pupil can use appropriate equipment, such as meter rule, to take measurements, such as distance travelled.
Pupils explore how to improve the quality of data	*Take precise measurements using standard units*	Pupil can recognise importance of using standard units and measures accurately.	Pupil can take measurements that are precise as well as accurate, e.g. measuring the force needed to pull different shapes of boat through the water.	Pupil can consider how by modifying instrument or technique, measurements can be improved.
Pupils understand the role of repeat readings	*Take and process repeat readings*	Pupil can, with prompting, can take repeat readings.	Pupil can know how to process repeat readings, e.g. when timing falling objects.	Pupil can identify situations in which taking repeat readings will improve the quality of evidence.
Recording Evidence (Y5)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils record work with diagrams and label them	*Record data and results*	Pupil can use words and diagrams to record findings.	Pupil can start to use labelled diagrams to show more complex outcomes, e.g. comparing the time of day at different places on the earth.	Pupil can use labelled diagrams to show more complex outcomes.
Pupils can display data using labelled diagrams, keys, tables and bar charts	*Record data using labelled diagrams, keys, tables and charts*	Pupil can use various ways to record evidence.	Pupil can, with prompting, use various ways to record complex evidence, e.g. when investigating how gears and levers enable a small force to	Pupil can use various ways, as appropriate, to record complex evidence.

			have a larger effect.	
Pupils can display data using line graphs	*Use line graphs to record data*	Pupil can, with prompting, use line graphs.	Pupil can use a line graph to record basic data, e.g. length and mass of a baby as it grows.	Pupil can use line graphs to display complex data.
Reporting Findings (Y5)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils process findings to develop conclusions and identify causal relationships	*Report and present findings from enquiries, including conclusions and, with prompting, suggest causal relationships*	Pupil can write a conclusion based on evidence.	Pupil can, with prompting, write a conclusion using evidence and identifying causal links, e.g. investigating what makes a parachute fall quicker.	Pupil can write a conclusion using evidence and identifying causal links.
Pupils use displays and presentations to report on findings	*With support, present findings from enquiries orally and in writing*	Pupil can present findings either in writing or orally.	Pupil can, with support, display and present key findings from enquiries orally and in writing, e.g. suggesting reasons for similarities and differences between various animals.	Pupil can display and present key findings from enquiries orally and in writing.
Pupils explain confidence in findings	*With prompting, identify that not all results may be trustworthy*	Pupil can indicate individual results that might be suspect.	Pupil can, with support, indicate why some results may not be entirely trustworthy, e.g. when timing falling objects.	Pupil can, in conclusions, indicate how trustworthy they are.
Conclusions/Predictions (Y5)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils can draw conclusions	*Suggest how evidence can support conclusions*	Pupil can, with prompting, show how evidence supports a conclusion.	Pupil can show how evidence supports a conclusion, e.g. researching gestation periods of various mammals and relating them to adult mass.	Pupil can identify how an idea is supported or refuted by evidence.
	Suggest further comparative or fair tests	Pupil can, with prompting, suggest further relevant comparative or fair tests.	Pupil can suggest further relevant comparative or fair tests, e.g. when testing materials for various properties to determine their suitability for an application.	Pupil can use evidence to suggest further comparative or fair tests that would develop the investigation.

Science Content – National Curriculum 2014 Year 5	
Content Learning Intentions Pupils should be taught about:	Non-Statutory

Biology 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.	▪ Pupils should study and raise questions about their local environment throughout the year. ▪ They should 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. ▪ They should find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall. ▪ Pupils should find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals. ▪ **Pupils might work scientifically by** observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times), asking pertinent questions and suggesting reasons for similarities and differences. They might try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. They might observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow.
Biology Animals including Humans ▪ describe the changes as humans develop to old age.	▪ Pupils should draw a timeline to indicate stages in the growth and development of humans. ▪ They should learn about the changes experienced in puberty. ▪ **Pupils could work scientifically by** researching the gestation periods of other animals and comparing them with humans; by finding out and recording the length and mass of a baby as it grows.
Chemistry 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	▪ Pupils should build a more systematic understanding of materials by exploring and comparing the properties of a broad range of materials, including relating these to what they learnt about magnetism in year 3 and about electricity in year 4. ▪ They should explore reversible changes, including, evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes. ▪ Pupils should explore changes that are difficult to reverse, for example, burning, rusting and other reactions, for example, vinegar with bicarbonate of soda. ▪ They should find out about how chemists create new materials, for

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.	example, Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinkle-free cotton. Note: Pupils are not required to make quantitative measurements about conductivity and insulation at this stage. It is sufficient for them to 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. ▪ **Pupils might work scientifically by:** carrying out tests to answer questions, for example, 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?' They might compare materials in order to make a switch in a circuit. They could observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes. They might research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials.
Physics 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	▪ Pupils should be introduced to a model of the Sun and Earth that enables them to explain day and night. ▪ Pupils should 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). ▪ They should 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). Note: Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. ▪ Pupils should find out about the way that ideas about the solar system have developed, understanding 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. ▪ **Pupils might work scientifically by:** comparing the time of day at different places on the Earth through internet links and direct communication; creating simple models of the solar system; constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day; finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks.
Physics Forces	▪ Pupils should explore falling objects and raise questions about the effects

• 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.	of air resistance. ▪ They should explore the effects of air resistance by observing how different objects such as parachutes and sycamore seeds fall. ▪ They should experience forces that make things begin to move, get faster or slow down. ▪ Pupils should 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. ▪ Pupils should explore the effects of levers, pulleys and simple machines on movement. ▪ Pupils might find out how scientists, for example, Galileo Galilei and Isaac Newton helped to develop the theory of gravitation. ▪ **Pupils might work scientifically by** exploring falling paper cones or cup-cake cases and designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective. They might explore resistance in water by making and testing boats of different shapes. They might design and make products that use levers, pulleys, gears and/or springs and explore their effects.

B. Science Content - Learning Progression
Year 5

Biology - Living Things and their Habitats, Animals including Humans (Y5)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Life exists in a variety of forms and goes through cycles – Animals	*Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird*	Explain what a life cycle is, e.g. that kittens grow into cats, have kittens and die.	Identify similarities and differences in two different life cycles, e.g. sparrow and butterfly, with reference to eggs and intermediate stages.	Suggest similarities in the life cycles of a number of vertebrates, e.g. comparison of dog, human and bird embryos.
	Describe the changes as humans develop to old age	Identify that people change as they age, e.g. recognise differences in appearance, abilities etc.	Describe the changes as humans develop to old age, e.g. trends in changes to size, weight, mobility etc.	Suggest why some of the changes that take place in humans happen, e.g. suggest why babies have disproportionately large heads
The human body has a number of systems, each with its own function	*Describe the life process of reproduction in some plants and animals*	Describe the life process of reproduction in humans.	Describe in sequence the stages of reproduction in some plants and animals, e.g. dog	Compare the process of reproduction in animals and plants, e.g. compare and

			and a thistle.	contrast fertilisation.
Chemistry – States of Matter (Y5)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Materials have physical properties which can be investigated and compare	*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*	Compare and group together everyday materials on the basis of their appearance and feel.	Test and sort a range of materials based on their physical properties. .	Suggest why those properties might influence the selection of those materials for certain uses.
	Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution	Know that some materials will dissolve in liquid to form a solution.	Describe how some materials, e.g. sugar, will dissolve and can be retrieved.	Identify that some soluble materials are more soluble than others.
	Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating	Suggest how mixtures might be separated.	Justify separation techniques proposed, with reference to materials being separated.	Explain why a particular separation method might be more effective.
	Demonstrate that dissolving, mixing and changes of state are reversible changes	Understand that some processes are reversible.	Show how the original materials can be retrieved from each of these changes.	Classify various processes relating to materials as reversible or irreversible.
	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.	Understand that burning is irreversible.	Identify reactants and products of chemical changes and recognise these as being irreversible.	Provide examples of when changes being irreversible are a good thing, e.g. making bricks, or not, e.g. non-biodegradable plastic bags.
The physical properties of materials determine their uses	*Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic*	Give reasons for the particular uses of everyday materials, including metals, wood and plastic.	Use evidence to justify the selection of a material for a purpose.	Suggest limitations of the uses of selected materials based on test results.

Physics – Forces (Y5)	Progression Statement	Working Towards	Working At	Working Beyond
There are contact and non-contact forces; these affect the motion of objects	*Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object*	Describe the effect of gravity on unsupported objects.	Explain that gravity causes objects to fall towards Earth.	Recognise that gravity acts between all masses, e.g. the Sun and the Earth.
	Identify the effects of air resistance, water resistance and friction, that act between moving surfaces	Recognise that motion may be resisted by forces.	Describe how motion may be resisted by air resistance, water resistance or friction.	Identify ways in which forces that oppose motion may be useful (e.g. bicycle handlebar grips) or a nuisance (e.g. bicycle chain).
	Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect	Recognise that simple machines transfer force.	Describe how some devices may turn a smaller force into a larger one.	Explain, with reference to everyday contexts, why a force multiplier might be useful.
Physics – Earth and Space (Y5)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Day, night, month, seasonal change & year are caused by the position and movement of the Earth	*Describe the movement of the Earth, and other planets, relative to the Sun in the solar system*	Recognise that the planets move, relative to the Sun.	Draw a diagram or use a model to describe planetary orbits.	Identify that the further out a planet is, the longer its orbit is around the Sun.
	Describe the movement of the Moon relative to the Earth	Recognise that the Moon moves relative to the Earth.	Draw a diagram or use a model to describe the Moon's orbit around the Earth.	Relate the Moon's orbit of the Earth to the Earth's orbit of the Sun.
Day, night, month, season change, and year are cause by the position change and movement of the Earth.	*Describe the Sun, Earth and Moon as approximately spherical bodies*	Sketch the outlines of the Sun, Earth and Moon.	Describe the Sun, Earth & Moon as spheres.	Recognise that many heavenly bodies are approximately spherical.
	Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky	Relate day and night to the apparent position of the Sun.	Use a diagram or model to explain why the Sun seems to travel across the sky, and what causes day and night.	Explain the effect of a planet in the solar system rotating at a different rate to Earth.
A. Working Scientifically - Learning Progression Year 6				
Planning Investigations (Y6)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**

Pupils can plan an enquiry	*Plan different types of scientific enquiries to answer questions*	Pupil can, with support, can answer questions using evidence gathered from different types of scientific enquiry.	Pupil can answer questions using evidence gathered from different types of scientific enquiry, e.g. operation of circulatory system from experiment, survey and secondary research.	Pupil can suggest which type of enquiry is likely to be more successful at providing answers to a particular question.
Pupils can identify and manage variables	*Recognise and control variables where necessary*	Pupil can, with prompting, identifies and manages variables.	Pupil can identify and manage variables, e.g. distances and sizes in shadow formation.	Pupil can identify and manage variables and recognises variables that cannot be easily managed.
Conducting Experiments (Y6)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils can use equipment to take measurements	*Take measurements using a range of scientific equipment*	Pupil can, following discussion of alternatives, select appropriate equipment, e.g. measuring jug to measure volume.	Pupil can use appropriate equipment, such as meter rule, to take measurements, such as distance travelled by light.	Pupil can recognise limitations of available equipment, e.g. accuracy of balance.
Pupils explore how to improve the quality of data	*Take measurements with increasing accuracy and precision*	Pupil can take measurements that are precise as well as accurate.	Pupil can consider how by modifying instrument or technique, measurements can be improved, e.g. when recording route of light rays	Pupil can evaluate different techniques, with reference to accuracy and precision.
Pupils understand the role of repeat readings	*Take repeat readings when appropriate*	Pupil can know how to process repeat readings.	Pupil can identify situations in which taking repeat readings will improve the quality of evidence, e.g. investigating the behaviour of components in a circuit.	Pupil can explain why repeatedly taking repeat readings is of little value.
Recording Evidence (Y6)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils record work with diagrams and label them	*Record data and results of increasing complexity using scientific diagrams and labels*	Pupil can start to use labelled diagrams to show more complex outcomes.	Pupil can use labelled diagrams to show complex outcomes, e.g. relating specific adaptations of organisms to environmental factors.	Pupil can explain why a labelled diagram may be particularly effective.
Pupils can display data using	*Record data and results of*	Pupil can, with prompting, uses	Pupil can use various ways, as	Pupil can evaluate various ways

labelled diagrams, keys, tables and bar charts	*increasing complexity using scientific diagrams and labels, classification keys, tables and bar charts*	various ways to record complex evidence.	appropriate, to record complex evidence, e.g. in the construction of a key to aid plant identification.	of recording complex data.
Pupils can display data using line graphs	*Record data and results of increasing complexity using line graphs*	Pupil can use a line graph to record basic data.	Pupil can use line graphs to display complex data, e.g. size of object in relation to the size of the shadow it casts.	Pupil can explain the advantages of using line graphs.
Reporting Findings (Y6)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils process findings to develop conclusions and identify causal relationships	*Report and present findings from enquiries, including conclusions and causal relationships*	Pupil can, with prompting, write a conclusion using evidence and identifying causal links.	Pupil can write a conclusion using evidence and identifying causal links, e.g. in the design of a periscope.	Pupil can suggest possible limits to causal relationships.
Pupils use displays and presentations to report on findings	*Report and presents findings from enquiries in oral and written forms such as displays and other presentation*	Pupil can, with support, display and present key findings from enquiries orally and in writing.	Pupil can display and present key findings from enquiries orally and in writing, e.g. deciding how well classifications fit unfamiliar animals and plants.	Pupil can evaluate the best way of displaying and presenting key findings
Pupils explain confidence in findings	*Report and present findings from enquiries, including explanations of, and degree of, trust in results*	Pupil can, with support, indicate why some results may not be entirely trustworthy.	Pupil can, in conclusions, indicate how trustworthy they are, e.g. in relating brightness of bulb to voltage supplied.	Pupil can, in conclusions, indicate, if appropriate, why the results may not be entirely trustworthy.
Conclusions/Predictions (Y6)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Pupils can draw conclusions	*Identify scientific evidence that has been used to support or refute ideas or arguments*	Pupil can show how evidence supports a conclusion.	Pupil can identify how an idea is supported or refuted by evidence, e.g. selective breeding to produce animals or plants with desirable characteristics	Pupil can suggest how factors other than evidence may support or oppose an idea.
Pupils can develop investigation further	*Use test results to make predictions to set up further comparative and fair tests*	Pupil can suggest further relevant comparative or fair tests.	Pupil can use evidence to suggest further comparative or fair tests that would develop the investigation, e.g. in the design of rear-view mirrors for cars.	Pupil can evaluate which further comparative or fair tests would be particularly useful.

Science Content – National Curriculum 2014 Year 6	
Content Learning Intentions Pupils should be taught about:	Non-Statutory
Biology 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.	▪ Pupils should build on their learning about grouping living things in year 4 by looking at the classification system in more detail. ▪ They should be 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). ▪ They should discuss reasons why living things are placed in one group and not another. ▪ Pupils might find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification. ▪ **Pupils might work scientifically by** using classification systems and keys to identify some animals and plants in the immediate environment. They could research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system
Biology Animals including Humans ▪ identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood ▪ recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function ▪ describe the ways in which nutrients and water are transported within animals, including humans	▪ Pupils should build on their learning from years 3 and 4 about the main body parts and internal organs (skeletal, muscular and digestive system) to explore and answer questions that help them to understand how the circulatory system enables the body to function. ▪ Pupils should 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. ▪ **Pupils might work scientifically by** exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.
Biology Evolution and Inheritance ▪ recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago ▪ recognise that living things produce offspring of the same kind, but	▪ Building on what they learned about fossils in the topic on rocks in year 3, pupils should find out more about how living things on earth have changed over time. ▪ They should be introduced to the idea that characteristics are passed from parents to their offspring, for instance by considering different breeds of

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.	dogs, and what happens when, for example, labradors are crossed with poodles. ▪ They should also appreciate that variation in offspring over time can make animals more or less able to survive in particular environments, for example, by exploring how giraffes' necks got longer, or the development of insulating fur on the arctic fox. ▪ Pupils might find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution. Note: At this stage, pupils are not expected to understand how genes and chromosomes work. ▪ **Pupils might work scientifically by** observing and raising questions about local animals and how they are adapted to their environment; comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels. They might analyse the advantages and disadvantages of specific adaptations, such as being on two feet rather than four, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers.
Physics 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.	▪ Pupils should build on the work on light in year 3, exploring the way that light behaves, including light sources, reflection and shadows. ▪ They should talk about what happens and make predictions. ▪ **Pupils might work scientifically by** deciding where to place rear-view mirrors on cars; designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works. They might investigate the relationship between light sources, objects and shadows by using shadow puppets. They could extend their experience of light by looking a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters (they do not need to explain why these phenomena occur).

B. Science Content - Learning Progression
Year 6

Biology - Living Things and their Habitats, Evolution and Inheritance (Y6)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Living things can be classified according to observable features	*Describe how living things are classified into broad groups according to common*	Identify the broad groups into which living things are classified, e.g. mammals.	Use similarities and differences in observable features to decide how living things should	Explore why some living things, such as the duck billed platypus, don't neatly fit into one group.

	observable characteristics and based on similarities and differences, including micro-organisms, plants and animals		be grouped, e.g. a cat is a mammal because it is warm blooded and gives birth to live young.	
	Give reasons for classifying plants and animals based on specific characteristics	State how plants and animals can be classified using specific characteristics.	Explain why certain features are useful in classifying living things, e.g. backbones in animals and flowers in plants.	Explain why other features are less useful as a basis for classification, such as size or colour.
Living things exhibit variation and adaptation and these may lead to evolution	*Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago*	Recognise that fossils provide information about living things from millions of years ago, e.g. understand that they are preserved remains of extinct living things.	Use fossils as evidence that living things have changed over time, e.g. explain that these have died out and others have taken their place.	Suggest possible reasons for changes to living things over time, e.g. why penguins can't fly but are good at swimming.
	Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents	Recognise that living things produce offspring of the same kind, but normally offspring vary, e.g. that puppies have common features but are not identical.	Recognise that offspring normally vary from each other and from their parents, e.g. that puppies vary from each other and from their parents.	Recognise that selective breeding may result in offspring with certain features, e.g. pedigree dogs with a certain shape or colour.
	Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution	Identify ways in which certain animals and plants are adapted to suit their environment in different ways.	Describe examples of a living thing that has adapted to live in a particular habitat and evolved as a result, e.g. a polar bear or cactus.	Give examples of living things that have evolved in different ways, e.g. different types of finch.
Biology – Animals including Humans (Y6)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
The human body has a number of systems, each with its own function	*Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood*	Name the main parts of the human circulatory system, e.g. heart, arteries, veins.	Describe what heart, blood vessels and blood do, e.g. carry oxygen to all parts of the body.	Explain some characteristics of the heart, blood vessels and blood, e.g. explain that the arteries are thicker because they carry blood at a higher pressure.
	Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function	Recognise that diet, exercise, drugs and lifestyle impact on the way the body functions, e.g. knowing that exercise	Suggest how their bodies are affected by substances and actions, e.g. that a high fat diet coupled with little exercise is	Explain how decisions about lifestyle can affect the quality of life, e.g. recognise that making excessive use of convenience

		changes the body.	likely to lead to obesity.	foods may introduce more additives into the diet.
	Describe the ways in which nutrients and water are transported within animals, including humans	Describe that nutrients and water are transported within humans.	Describe with aid of diagrams the route that water takes within animals, e.g. through the human body.	Compare the ways in which nutrients and water are transported in two animals that are quite different.
Physics – Light (Y6)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Light and sound can be reflected and absorbed and enable us to see and hear	*Recognise that light appears to travel in straight lines*	Recognise that light travels from one point to another.	Represent light using straight line ray diagrams.	Recognise that even when light changes in direction, the path is still continuous.
	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	Recognise that some objects reflect light.	Draw diagrams using straight lines showing light travelling to the eye.	Draw diagrams using straight lines showing light reflecting off objects and 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	Describe how light travels from light sources to our eyes.	Explain how we can see an object by referring to light travelling into the eye.	Refer to the idea that some objects may be better reflectors than others.
	Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them	Relate the shape of shadows to the shape of the object that makes them.	Draw a diagram showing an object, shadow and light to relate object shape to shadow shape.	Use a diagram to explain that although a shadow is the same shape as the object, it may not be the same size.
Physics – Electricity (Y6)	**Progression Statement**	**Working Towards**	**Working At**	**Working Beyond**
Electricity can make circuits work and can be controlled to perform useful functions	*Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in a circuit*	Recognise that changing the number and voltage of cells may alter the operation of a circuit.	Explain how number and voltage of cells affects the lamp or buzzer.	Relate the number or voltage of cells to the number and operation of bulbs or buzzers that can be run from them.
	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*	Identify the function and operation of different components.	Explain the use of switches, how bulbs can be made brighter and buzzers made louder.	Explain the effect of changing the order of the components in a circuit.
	Use recognised symbols when	Understand that components	Represent a circuit that has	Design circuits using symbols.

	representing a simple circuit in a diagram	can be represented by symbols.	been constructed using symbols.	