

Hazelbury Bryan Primary School

Science Disciplinary Knowledge Progression

Science progression across the school

To be achieved by:	Key Stage 1		Lower Key Stage 2		Upper Key Stage 2	
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Questioning and enquiring Planning	<p>Ask simple questions about the world around us.</p> <p>Begin to recognise that they can be answered in different ways (different types of enquiry including - observing changes over time, noticing patterns, grouping and classifying, carrying out simple comparative tests, finding things out from secondary sources).</p>	<p>Ask questions about the world around us.</p> <p>Recognise that they can be answered in different ways (different types of enquiry including - observing changes over time, noticing patterns, grouping and classifying, carrying out simple comparative tests, finding things out from secondary sources).</p>	<p>Ask some relevant questions and use different types of scientific enquiries to answer them.</p> <p>Begin to explore everyday phenomena and the relationships between living things and familiar environments.</p> <p>Begin to develop their ideas about functions, relationships and interactions.</p> <p>Begin to raise their own questions about the world around them.</p> <p>Begin to make some decisions about which types of enquiry will be the best way of answering questions including observing changes over time, noticing patterns, grouping and classifying, carrying out simple practical enquiries, comparative and fair tests, finding things out using secondary sources.</p>	<p>Ask relevant questions and use different types of scientific enquiries to answer them.</p> <p>Explore everyday phenomena and the relationships between living things and familiar environments.</p> <p>Begin to develop their ideas about functions, relationships and interactions.</p> <p>Raise their own questions about the world around them.</p> <p>Make some decisions about which types of enquiry will be the best way of answering questions including observing changes over time, noticing patterns, grouping and classifying, carrying out simple practical enquiries, comparative and fair tests, finding things out using secondary sources.</p>	<p>Begin to plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Begin to explore and talk about ideas, ask their own questions about scientific phenomena, analyse functions, relationships and interactions more systematically.</p> <p>Begin to recognise some more abstract ideas and begin to recognise how these ideas help them to understand how the world operates.</p> <p>Begin to recognise scientific ideas change and develop over time.</p> <p>Begin to 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, carrying out</p>	<p>Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Explore and talk about ideas, ask their own questions about scientific phenomena, analyse functions, relationships and interactions more systematically.</p> <p>Begin to recognise more abstract ideas and begin to recognise how these ideas help them to understand how the world operates.</p> <p>Begin to recognise scientific ideas change and develop over time.</p> <p>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, carrying out</p>

					comparative and fair tests and finding things out using a wide range of secondary sources of information.)	comparative and fair tests and finding things out using a wide range of secondary sources of information.)
Observing, measuring and pattern seeking	<p>Begin to observe closely, using simple equipment.</p> <p>Use simple observations and ideas to suggest answers to questions.</p> <p>To observe simple changes over time and, with guidance, begin to notice patterns and relationships.</p> <p>To say what I am looking for and what I am measuring. To know how to use simple equipment safely.</p> <p>Use simple measurements and equipment with support (eg hand lenses and egg timers)</p> <p>Begin to progress from non-standard units, reading cm, m, cl, l, °C</p>	<p>Observe closely, using simple equipment.</p> <p>Use observations and ideas to suggest answers to questions.</p> <p>To observe changes over time and, with guidance, begin to notice patterns and relationships.</p> <p>To say what I am looking for and what I am measuring. To know how to use simple equipment safely.</p> <p>Use simple measurements and equipment with increasing independence (eg hand lenses and egg timers)</p> <p>Begin to progress from non-standard units, reading mm, cm, m, ml, l, °C</p>	<p>Begin to make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p>Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them.</p> <p>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.</p> <p>Learn to use some new equipment appropriately (eg data loggers).</p> <p>Begin to see a pattern in my results.</p> <p>Begin to choose from a selection of equipment.</p> <p>Begin to observe and measure accurately using standard units including time in minutes and seconds.</p>	<p>Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p>Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them.</p> <p>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.</p> <p>Learn to use new equipment appropriately (eg data loggers).</p> <p>Can see a pattern in my results.</p> <p>Can choose from a selection of equipment.</p> <p>Can observe and measure accurately using standard units including time in minutes and seconds.</p>	<p>Begin to take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate.</p> <p>Begin to identify patterns that might be found in the natural environment.</p> <p>Begin to 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 and explain how to use it accurately.</p> <p>Begin to interpret data and find patterns.</p> <p>Select equipment on my own.</p> <p>Make a set of observations and say what the interval and range are.</p> <p>Begin to take accurate and precise measurements - N, g, kg, mm, cm, mins, seconds, cm² V, km/h, m per sec, m/ sec Graphs - pie, line</p>	<p>Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate.</p> <p>Identify patterns that might be found in the natural environment.</p> <p>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 and explain how to use it accurately.</p> <p>Can interpret data and find patterns. Select equipment on my own.</p> <p>Make a set of observations and say what the interval and range are.</p> <p>Accurate and precise measurements - N, g, kg, mm, cm, mins, seconds, cm² V, km/h, m per sec, m/ sec Graphs - pie, line, bar (Year 6)</p>
Investigating	<p>Perform simple tests with support.</p> <p>To begin to discuss my ideas</p>	<p>Perform simple tests.</p> <p>To discuss my ideas about how to find things out.</p>	<p>Set up some simple practical enquiries, comparative and fair tests.</p>	<p>Set up simple practical enquiries, comparative and fair tests.</p>	<p>Begin to use test results to make predictions to set up further</p>	<p>Use test results to make predictions to set up further comparative and fair tests.</p>

	<p>about how to find things out.</p> <p>To begin to say what happened in my investigation.</p>	<p>To say what happened in my investigation.</p>	<p>Begin to recognise when a simple fair test is necessary and help to decide how to set it up.</p> <p>Begin to think of more than one variable factor.</p>	<p>Recognise when a simple fair test is necessary and help to decide how to set it up.</p> <p>Can think of more than one variable factor.</p>	<p>comparative and fair tests.</p> <p>Begin to recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why.</p> <p>Begin to suggest improvements to my method and give reasons. Begin to decide when it is appropriate to do a fair test.</p>	<p>Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why.</p> <p>Suggest improvements to my method and give reasons. Decide when it is appropriate to do a fair test.</p>
<p>Recording and Reporting Findings</p>	<p>Gather and record data with some adult support, to help in answering questions.</p> <p>Begin to record simple data.</p> <p>Begin to record and communicate their findings in a range of ways.</p> <p>Can show my results in a simple table that my teacher has provided.</p>	<p>Gather and record data to help in answering questions.</p> <p>Record simple data.</p> <p>Record and communicate their findings in a range of ways.</p> <p>Can show my results in a table that my teacher has provided.</p>	<p>Gather, record, and begin to classify and present data in a variety of ways to help in answering questions.</p> <p>Begin to record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.</p> <p>Begin to report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>Begin to use notes, simple tables and standard units and help to decide how to record and analyse their data.</p>	<p>Gather, record, classify and present data in a variety of ways to help in answering questions.</p> <p>Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.</p> <p>Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>Use notes, simple tables and standard units and help to decide how to record and analyse their data.</p>	<p>Begin to record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables and bar and line graphs.</p> <p>Begin to report and present findings from enquiries.</p> <p>Begin to decide how to record data from a choice of familiar approaches.</p> <p>Begin to choose how best to present data.</p>	<p>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables and bar and line graphs.</p> <p>Report and present findings from enquiries.</p> <p>Decide how to record data from a choice of familiar approaches.</p> <p>Can choose how best to present data.</p>
<p>Identifying, Grouping and Classifying</p>	<p>Identify and classify with some support.</p> <p>To begin to observe and identify, compare and describe.</p> <p>To begin to use simple features to compare objects, materials and</p>	<p>Identify and classify.</p> <p>Observe and identify, compare and describe.</p> <p>Use simple features to compare objects, materials and living things and, with help, decide how to sort</p>	<p>Begin to identify differences, similarities or changes related to simple scientific ideas and processes.</p> <p>Begin to talk about criteria for grouping, sorting and classifying and use</p>	<p>Identify differences, similarities or changes related to simple scientific ideas and processes.</p> <p>Talk about criteria for grouping, sorting and classifying and use simple keys.</p>	<p>Begin to use and develop keys and other information records to identify, classify and describe living things and materials.</p>	<p>Use and develop keys and other information records to identify, classify and describe living things and materials.</p>

	living things and, with help, decide how to sort and group them.	and group them.	simple keys. Begin to compare and group according to behaviour or properties, based on testing.	Compare and group according to behaviour or properties, based on testing.		
Research	To begin to use simple secondary sources to find answers. To begin to find information to help me from books and computers with help.	Use simple secondary sources to find answers. Can find information to help me from books and computers with help.	Begin to recognise when and how secondary sources might help to answer questions that cannot be answered through practical investigations.	Begin to recognise when and how secondary sources might help to answer questions that cannot be answered through practical investigations.	Begin to recognise which secondary sources will be most useful to research their ideas.	Recognise which secondary sources will be most useful to research their ideas.
Conclusions	Begin to talk about what they have found out and how they found it out. To begin to say what happened in my investigation. To begin to say whether I was surprised at the results or not. To begin to say what I would change about my investigation.	Talk about what they have found out and how they found it out. To say what happened in my investigation. To say whether I was surprised at the results or not. To say what I would change about my investigation.	Begin to use results to draw simple conclusions , make predictions for new values, suggest improvements and raise further questions. Am beginning to use straightforward scientific evidence to answer questions or to support their findings. With help, am beginning to look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. With support, am beginning to identify new questions arising from the data, make new predictions and find ways of improving what they have already done. Am beginning to see a pattern in my results. Am beginning to say what I found out, linking cause and effect. Am beginning to say how I could make it better.	Using results to draw simple conclusions , make predictions for new values, suggest improvements and raise further questions. Use straightforward scientific evidence to answer questions or to support their findings. With help, look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. With support, identify new questions arising from the data, make new predictions and find ways of improving what they have already done. Can see a pattern in my results. Can say what I found out, linking cause and effect.	Am beginning to report and present findings from enquiries , including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Begin to identify scientific evidence that has been used to support or refute ideas or arguments. Begin to draw conclusions based on their data and observations, use evidence to justify their ideas, use scientific knowledge and understanding to explain their findings. Begin to use test results to make predictions to set up further comparatives and fair tests. Begin to look for different causal relationships in their	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. Identify scientific evidence that has been used to support or refute ideas or arguments. Draw conclusions based on their data and observations, use evidence to justify their ideas, use scientific knowledge and understanding to explain their findings. Use test results to make predictions to set up further comparatives and fair tests. Look for different causal relationships in their data and identify evidence that refutes or supports their ideas.

			<p>Am beginning to answer questions from what I have found out.</p>	<p>Can say how I could make it better. Can answer questions from what I have found out.</p>	<p>data and identify evidence that refutes or supports their ideas.</p> <p>Use their results to identify when further tests and observations are needed.</p> <p>Begin to separate opinion from fact.</p> <p>Begin to draw conclusions and identify scientific evidence. Can use simple models. Know which evidence proves a scientific point.</p> <p>Begin to use test results to make predictions to set up further comparative and fair tests.</p>	<p>Use their results to identify when further tests and observations are needed.</p> <p>Separate opinion from fact.</p> <p>Can draw conclusions and identify scientific evidence. Can use simple models. Know which evidence proves a scientific point.</p> <p>Use test results to make predictions to set up further comparative and fair tests.</p>
<p>Vocabulary</p>	<p>Use some simple scientific language. Begin to use some science words. Use comparative language with support.</p>	<p>Use simple scientific language and some science words.</p> <p>Use comparative language - bigger, faster etc</p>	<p>Begin to use some scientific language to talk and, later, write about what they have found out.</p> <p>Begin to use relevant scientific language.</p> <p>Begin to use comparative and superlative language.</p>	<p>Use some scientific language to talk and, later, write about what they have found out.</p> <p>Use relevant scientific language.</p> <p>Use comparative and superlative language</p>	<p>Begin to read, spell and pronounce scientific vocabulary correctly. Begin to use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.</p> <p>Begin to confidently use a range of scientific vocabulary.</p> <p>Begin to use conventions such as trend, rogue result, support prediction and -er word generalisation.</p> <p>Begin to use scientific ideas when describing simple processes. Begin to use the correct science vocabulary</p>	<p>Read, spell and pronounce scientific vocabulary correctly.</p> <p>Use relevant scientific language. And illustrations to discuss, communicate and justify scientific ideas.</p> <p>Can confidently use a range of scientific vocabulary.</p> <p>Can use conventions such as trend, rogue result, support prediction and -er word generalisation.</p> <p>Can use scientific ideas when describing simple processes. Can use the correct science vocabulary</p>

Understanding

Can begin to talk about how science helps us in our daily lives eg. torches and lights help us see when it is dark.

Am beginning to understand science can sometimes be dangerous.

Can talk about how science helps us in our daily lives eg. torches and lights help us see when it is dark.

Am beginning to understand science can sometimes be dangerous.

Begin to know which things in science have made our lives better.

Can begin to understand risk in science.

Knows which things in science have made our lives better.

Can understand there is some risk in science.

Begin to talk about how scientific ideas have changed over time.

Begin to explain the positive and negative effects of scientific development.

Begin to see how science is useful in everyday life.

Begin to say which parts of our lives rely on science.

Can talk about how scientific ideas have changed over time.

Can explain the positive and negative effects of scientific development.

Can see how science is useful in everyday life.

Can say which parts of our lives rely on science.

Progression in Topic Related Knowledge

National Curriculum statements in red are from other linked topics.

Plants

Early learning goal	<ul style="list-style-type: none"> Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
Year 1	<ul style="list-style-type: none"> Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees.
Year 2	<ul style="list-style-type: none"> Observe and describe how seeds and bulbs grow into mature plants. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats)
Year 3	<ul style="list-style-type: none"> 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.
Year 4	<ul style="list-style-type: none"> Recognise that living things can be grouped in a variety of ways. (Y4 - Living things and their habitats) Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. (Y4 - Living things and their habitats) Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats)
Year 5	<ul style="list-style-type: none"> Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats)
Year 6	<ul style="list-style-type: none"> Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. (Y6 - Living things and their habitats) Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)
KS3	<ul style="list-style-type: none"> Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms.

Living things and their habitats

Early learning goal	<ul style="list-style-type: none"> • Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
Year 1	<ul style="list-style-type: none"> • Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants) • Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants) • Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans) • Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals including humans) • Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 – Animals, including humans) • Observe changes across the four seasons. (Y1 - Seasonal change)
Year 2	<ul style="list-style-type: none"> • 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. • Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals including humans)
Year 3	<ul style="list-style-type: none"> • Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants)
Year 4	<ul style="list-style-type: none"> • 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. • Construct and interpret a variety of food chains, identifying producers, predators and prey. (Y4 - Animals, including humans)
Year 5	<ul style="list-style-type: none"> • 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.
Year 6	<ul style="list-style-type: none"> • 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. • Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. (Y6 - Evolution and inheritance)

	<ul style="list-style-type: none">• Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. (Y6 - Evolution and inheritance)
KS3	<ul style="list-style-type: none">• Reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta.• Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms.• Differences between species.

Animals, including humans

<p>Early learning goal</p>	<ul style="list-style-type: none"> • Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
<p>Year 1</p>	<ul style="list-style-type: none"> • 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.
<p>Year 2</p>	<ul style="list-style-type: none"> • 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. • 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. (Y2 - Living things and their habitats)
<p>Year 3</p>	<ul style="list-style-type: none"> • 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.
<p>Year 4</p>	<ul style="list-style-type: none"> • 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.
<p>Year 5</p>	<ul style="list-style-type: none"> • Describe the changes as humans develop to old age. • Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. (Y5 - Living things and their habitats) • Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats)
<p>Year 6</p>	<ul style="list-style-type: none"> • 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. • Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. (Y6 - Living things and their habitats) • Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)

KS3

- Reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta.
- The consequences of imbalances in the diet, including obesity, starvation and deficiency diseases.
- The effects of recreational drugs (including substance misuse) on behaviour, health and life processes.
- The structure and functions of the gas exchange system in humans, including adaptations to function.
- The mechanism of breathing to move air in and out of the lungs.
- The impact of exercise, asthma and smoking on the human gas exchange system.

Evolution and inheritance

Early learning goal	<ul style="list-style-type: none"> Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
Year 1	
Year 2	<ul style="list-style-type: none"> Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. (Y2 - Living things and their habitats) Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans)
Year 3	<ul style="list-style-type: none"> Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Y3 - Rocks) Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants)
Year 4	<ul style="list-style-type: none"> Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats)
Year 5	<ul style="list-style-type: none"> Describe the life process of reproduction in some plants and animals. (Living things and their habitats - Y5)
Year 6	<ul style="list-style-type: none"> Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
KS3	<ul style="list-style-type: none"> Heredity as the process by which genetic information is transmitted from one generation to the next. A simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model. The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection. Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction.

Seasonal changes

Early learning goal	<ul style="list-style-type: none">• Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
Year 1	<ul style="list-style-type: none">• Observe changes across the four seasons.• Observe and describe weather associated with the seasons and how day length varies.
Year 2	
Year 3	<ul style="list-style-type: none">• Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. (Y3 - Light)
Year 4	
Year 5	<ul style="list-style-type: none">• Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky. (Y5 - Earth and space)
Year 6	
KS3	<ul style="list-style-type: none">• The seasons and the Earth's tilt, day length at different times of year, in different hemispheres.

Materials

Early learning goal	<ul style="list-style-type: none"> • Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
Year 1	<ul style="list-style-type: none"> • 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.
Year 2	<ul style="list-style-type: none"> • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.
Year 3	<ul style="list-style-type: none"> • Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. (Y3 - Rocks) • Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Y3 - Rocks) • 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. (Y3 - Forces and magnets)
Year 4	<ul style="list-style-type: none"> • 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. • Recognise some common conductors and insulators, and associate metals with being good conductors. (Y4 - Electricity)
Year 5	<ul style="list-style-type: none"> • Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. • Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. • Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. • Demonstrate that dissolving, mixing and changes of state are reversible changes. • Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.

Year 6	
KS3	<ul style="list-style-type: none">• Chemical reactions as the rearrangement of atoms.• Representing chemical reactions using formulae and using equations.• Combustion, thermal decomposition, oxidation and displacement reactions.• Defining acids and alkalis in terms of neutralisation reactions.• The pH scale for measuring acidity/alkalinity; and indicators.

Rocks

Early learning goal	<ul style="list-style-type: none">• Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
Year 1	<ul style="list-style-type: none">• Distinguish between an object and the material from which it is made. (Y1 - Everyday materials)• Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials)• Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials)• Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials)
Year 2	<ul style="list-style-type: none">• Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)
Year 3	<ul style="list-style-type: none">• 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.
Year 4	
Year 5	
Year 6	<ul style="list-style-type: none">• Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. (Y6 - Evolution and inheritance)
KS3	<ul style="list-style-type: none">• The composition of the Earth.• The structure of the Earth.• The rock cycle and the formation of igneous, sedimentary and metamorphic rocks.

Light

Early learning goal	<ul style="list-style-type: none"> • Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
Year 1	<ul style="list-style-type: none"> • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans) • Describe the simple physical properties of a variety of everyday materials. (Y1 - Materials)
Year 2	
Year 3	<ul style="list-style-type: none"> • 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.
Year 4	
Year 5	<ul style="list-style-type: none"> • 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. (Y5 - Properties and changes of materials)
Year 6	<ul style="list-style-type: none"> • 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.
KS3	<ul style="list-style-type: none"> • The similarities and differences between light waves and waves in matter. • Light waves travelling through a vacuum; speed of light. • The transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface. • Use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative); the human eye. • Light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras. • Colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection.

Forces

Early learning goal	<ul style="list-style-type: none">• Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
Year 1	
Year 2	<ul style="list-style-type: none">• Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)
Year 3	<ul style="list-style-type: none">• Compare how things move on different surfaces.• Notice that some forces need contact between two objects, but magnetic forces can act at a distance.• Observe how magnets attract or repel each other and attract some materials and not others.• Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.• Describe magnets as having two poles.• Predict whether two magnets will attract or repel each other, depending on which poles are facing.
Year 4	
Year 5	<ul style="list-style-type: none">• Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.• Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.• Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.
Year 6	
KS3	<ul style="list-style-type: none">• Magnetic fields by plotting with compass, representation by field lines.• Earth's magnetism, compass and navigation.• Forces as pushes or pulls, arising from the interaction between two objects.• Using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces.• Moment as the turning effect of a force.• Forces: associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water.• Forces measured in Newtons, measurements of stretch or compression as force is changed.

Sound

Early learning goal	<ul style="list-style-type: none">• Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
Year 1	<ul style="list-style-type: none">• Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans)
Year 2	
Year 3	
Year 4	<ul style="list-style-type: none">• 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.
Year 5	
Year 6	
KS3	<ul style="list-style-type: none">• Waves on water as undulations which travel through water with transverse motion; these waves can be reflected, and add or cancel – superposition.• Frequencies of sound waves, measured in Hertz (Hz); echoes, reflection and absorption of sound.• Sound needs a medium to travel, the speed of sound in air, in water, in solids.• Sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal.• Auditory range of humans and animals.• Pressure waves transferring energy; use for cleaning and physiotherapy by ultra-sound.• Waves transferring information for conversion to electrical signals by microphone.

Electricity

Early learning goal	<ul style="list-style-type: none">• Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
Year 1	
Year 2	
Year 3	
Year 4	<ul style="list-style-type: none">• Identify common appliances that run on electricity.• Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. • Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery.• Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. • Recognise some common conductors and insulators, and associate metals with being good conductors.
Year 5	
Year 6	<ul style="list-style-type: none">• Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. • Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.• Use recognised symbols when representing a simple circuit in a diagram.
KS3	<ul style="list-style-type: none">• Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge.• Potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current.• Differences in resistance between conducting and insulating components (quantitative).• Static electricity.

Earth and space

Early learning goal	<ul style="list-style-type: none">• Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
Year 1	<ul style="list-style-type: none">• Observe changes across the four seasons. (Y1 - Seasonal changes)• Observe and describe weather associated with the seasons and how day length varies. (Y1 - Seasonal changes)
Year 2	
Year 3	
Year 4	
Year 5	<ul style="list-style-type: none">• 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.
Year 6	
KS3	<ul style="list-style-type: none">• Gravity force, weight = mass x gravitational field strength (g), on Earth $g=10$ N/kg, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only).• Our Sun as a star, other stars in our galaxy, other galaxies.• The seasons and the Earth's tilt, day length at different times of year, in different hemispheres.• The light year as a unit of astronomical distance.