



Science – Early Years Foundation Stage and The National Curriculum

By the end of each Key Stage, children are expected to:

To inspire curiosity in the world around us.

EYFS	KS1	KS2	
<p>Children will make sense of their physical world and their community through opportunities to explore, observe and find out about people, places, technology and the environment.</p> <p style="text-align: center;">Understanding the world</p> <ul style="list-style-type: none"> • The world: children will be taught about similarities and differences in relation to places, objects, materials and living things. They will talk about the features of their own immediate environment and how environments might vary from one another. They will make observations of animals and plants, explain why some things occur, and talk about changes. • People and communities: children will talk about past and present events in their own lives and in the lives of family members. They will know that other children don't always enjoy the same things, and are sensitive to this. They will know about similarities and differences between themselves and others, and among families, communities and traditions. • Technology: children will recognise that a range of technology is used in places such as homes and schools. They select and use technology for particular purposes. 	<p>Pupils will experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. They will be encouraged to be curious and ask questions about what they notice. They will 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 will also 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.</p> <p><i>Pupils will be taught through:</i></p> <ul style="list-style-type: none"> • Use of first-hand practical experiences, but also be some use of appropriate secondary sources, such as books, photographs and videos. • 'Work Scientifically,' in a way that is clearly related to the teaching of substantive science content in the programme of study. • Reading and spelling scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1. 	<p>Years 3/4</p> <p>Pupils will broaden their scientific view of the world around them. They will 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 will draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.</p> <p><i>Pupils will be taught through:</i></p> <ul style="list-style-type: none"> • 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. • Working scientifically in a way that is clearly related to substantive science content in the programme of study. • Enabling them to read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. 	<p>Years 5/6</p> <p>Pupils will develop a deeper understanding of a wide range of scientific ideas. They will explore and talk about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, as they encounter more abstract ideas they will begin to recognise how these ideas help them to understand and predict how the world operates. They will also begin to recognise that scientific ideas change and develop over time. Pupils will experiment and make conclusions based on their data and observations, using evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.</p> <p><i>Pupils will be taught through:</i></p> <ul style="list-style-type: none"> • 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. • Working scientifically in substantive science content linked to their programme of study. • Being shown how scientific methods and skills might be linked to specific elements of the content. • Enabling them to read and spell and pronounce scientific vocabulary correctly.

CWorking Scientifically	Foundation Expectations	Y1 Expectations	Lower KS2 Expectations	Upper KS2 Expectations
Overview	Children in Foundation Stage will be taught about similarities and differences in relation to places, objects, materials and living things. They will talk about the features of their own immediate environment and how environments might vary from one another. They will make observations of animals and plants, explain why some things occur, and talk about changes.	Pupils in years 1 and 2 will explore the world around them and raise their own questions. They will experience different types of scientific enquiries, including practical activities, and begin to recognise ways in which they might answer scientific questions. They will 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 will ask people questions and use simple secondary sources to find answers. They will 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. They will be given opportunities to work scientifically and with help, they will record and communicate their findings in a range of ways and begin to use simple scientific language.	Pupils in years 3 and 4 will 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 also 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. 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. Opportunities for working scientifically will 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.	Pupils in years 5 and 6 will 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. They should have 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.
Practical Skills Assessment	<ul style="list-style-type: none"> • I can make observation about my environment. • I can state similarities and differences. • I can explain why some things occur. • I can compare materials, objects and living things. 	<ul style="list-style-type: none"> • I can ask simple questions and recognise that they can be answered in different ways • I can observe closely, using simple equipment. • I can perform simple tests. • I can identify and classify things. • I can use my observations and ideas to suggest answers to questions. • I can gather and record data to help in answer questions. 	<ul style="list-style-type: none"> • I can ask relevant questions and use different types of scientific enquiries to answer them. • I can set up simple practical enquiries, comparative and fair tests. • I can make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. • I can gather, record, classify and present data in a variety of ways to help in answering questions. • I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. • I can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. • I can use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. • I can identify differences, similarities or changes related to simple scientific ideas and processes. • I can use straightforward scientific evidence to answer questions or to support their findings. 	<ul style="list-style-type: none"> • I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. • I can take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. • I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. • I can use test results to make predictions to set up further comparative and fair tests. • I can 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. • I can identify scientific evidence that has been used to support or refute ideas or arguments.
Key Vocabulary	changes, similarities and difference, why,	question, answer, observe, test, gather, record, data, suggest, primary, secondary, sources, practical, enquiry, compare, contrast, patterns, change, group, sort, features	relevant, comparative, fair, systematic, measurements, units, equipment, loggers, diagrams, labels, conclusions, present, classify, explanation, predictions, improvements, findings, support, differences, keys, bar charts, tables, scientific, thermometers, accurate, processes, results, range	refute, trust, displays, presentations, scatter graph, line graphs, illustrate, justify, discuss, develop, causal relationships

Chemistry

Materials, including rocks and states of matter, evolution	Foundation Expectations	Y1 Expectations	Y2 Expectations	Y3 Expectations	Y4 Expectations	Y5 Expectations	Y6 Expectations
Overview	Pupils should know about similarities and differences in relation to materials.	Materials Pupils will explore, name, discuss and raise/answer questions about everyday materials so that they become familiar with their names and properties.	Materials Pupils will identify and discuss the uses of different everyday materials so that they become familiar with how some materials are used for more than one or different materials are used for the same thing. Pupils should think about the properties of materials that make them suitable or unsuitable for particular purposes. Pupils might find out about people who have developed useful new materials.	Rocks Pupils will observe rocks and explore how and why they might have changed over time. Pupils will research and discuss the different kinds of living things whose fossils are found and explore how fossils are formed. Pupils will also explore different soils and identify similarities and differences between them.	States of Matter Pupils will explore a variety of everyday materials and develop simple descriptions of the states of matter. Pupils will observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled.	Properties and Changes of Material Pupils will 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. Pupils will observe and compare the changes that take place. They will explore reversible changes, including, evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes. Pupils will also find out about how chemists create new materials and research/discuss how chemical changes have an impact on our lives.	Evolution and Inheritance Pupils will build on what they learned about fossils in the topic on rocks in year 3, finding out more about how living things on earth have changed over time. They will be introduced to the idea that characteristics are passed from parents to their offspring. They will appreciate that variation in offspring over time can make animals more or less able to survive in particular environments. Pupils will also find out about the work of paleontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution.
Key Terminology	materials environment describing words e.g. smooth rough bumpy	hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent. Material, wood, plastic, glass, metal, water, rock, brick, paper, fabrics, elastic, foil	uses, identify classifying, record, observe, properties, purpose,	soils, rocks, fossils- amber/cast etc sediment, adjectives for categorisation e.g.- permeable, porous	temperature, heat, cool, observe, change, non-chemical, state, solid, liquid, gas, evaporation, condensation, precipitation, water cycle, degrees	solubility, transparency, conductivity (electrical and thermal), filtering, sieving, dissolving, substance, solution, reversible, irreversible, separating, burning, evaporating, mixing, state, evidence	evolution, environment, paleontologist, characteristics, survival, adapt
Practical Assessment Criteria	<ul style="list-style-type: none"> I can talk about the features of my own immediate environment and how environments might vary from one another. 	<ul style="list-style-type: none"> I can explore and experiment with a wide variety of materials by performing simple tests to explore questions. 	<ul style="list-style-type: none"> I can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. I can observe closely, identifying and classifying the uses of different materials, and recording mt observations. 	<ul style="list-style-type: none"> I can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. 	<ul style="list-style-type: none"> I can compare and group materials together, according to whether they are solids, liquids or gases. I can 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). 	<ul style="list-style-type: none"> I can compare and group together everyday materials on the basis of their properties and response to magnets. I can use my knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. I can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. I can demonstrate that dissolving, mixing and changes of state are reversible changes. 	<ul style="list-style-type: none"> I can observe and raise questions about local animals and how they are adapted to their environment.

<p>Knowledge Assessment Criteria</p>	<ul style="list-style-type: none"> I can make observations of materials and explain why some things occur, and talk about changes. 	<ul style="list-style-type: none"> I can distinguish between an object and the material from which it is made. I can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. I can describe the simple physical properties of a variety of everyday materials I can compare and group together a variety of everyday materials on the basis of their simple physical properties. 	<ul style="list-style-type: none"> I can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. 	<ul style="list-style-type: none"> I can describe in simple terms how fossils are formed when things that have lived are trapped within rock. I recognise that soils are made from rocks and organic matter. 	<ul style="list-style-type: none"> I can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. 	<ul style="list-style-type: none"> I know that some materials will dissolve in liquid to form a solution and can describe how to recover a substance from a solution. I can 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. 	<ul style="list-style-type: none"> I recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. I recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. I can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
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Biology

Plants	Foundation Expectations	Y1 Expectations	Y2 Expectations	Y3 Expectations
Overview	Pupils should know about similarities and differences in relation to places and living things, including plants.	Pupils will 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 that they have planted. They should become familiar with common names of flowers, examples of deciduous and evergreen trees, and plant structures.	Pupils will use the local environment throughout the year to observe how different plants grow. 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.	Pupils will be introduced to the relationship between structure and function: the idea that every part of a plant 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
Key Terminology	plants, living, dead, environment, features, changes	plants, leaves, flowers, (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem), trees, evergreen, deciduous, habitat, growing, environment	growth, germination, survival, reproduction, seed, bulb, water, light, observe, temperature, healthy	nutrient, light, soil, nutrition, flowering, pollination, seed dispersal, life cycle, functions, reproduction
Practical Assessment Criteria	<ul style="list-style-type: none"> I can talk about the features of my own immediate environment and how environments might vary from one another. 	<ul style="list-style-type: none"> I can observe plants closely, using simple equipment. I can compare and contrast familiar plants; describing how I am able to identify and group them. I can draw diagrams showing the parts of different plants including trees. I can record how plants have changed over time. 	<ul style="list-style-type: none"> I can observe and describe how seeds and bulbs grow into mature plants. I can set up a comparative test to show that plants need light and water to stay healthy. 	<ul style="list-style-type: none"> I can investigate the way in which water is transported within plants. I can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. I can observe factors of plant growth over time.
Knowledge Assessment Criteria	<ul style="list-style-type: none"> I can make observations of animals and plants and explain why some things occur and talk about changes. 	<ul style="list-style-type: none"> I can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. I can identify and describe the basic structure of a variety of common flowering plants, including trees. 	<ul style="list-style-type: none"> I can find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. 	<ul style="list-style-type: none"> I can identify and describe the functions of different parts of flowering plants. I understand the requirements of plants for life/growth and how they vary from plant to plant.

Animals Including Humans	Foundation Expectations	Y1 Expectations	Y2 Expectations	Y3 Expectations	Y4 Expectations	Y5 Expectations	Y6 Expectations
Overview	<p>Pupils will learn about similarities and differences in relation to places and living things, including plants.</p> <p>Pupils learn about similarities and differences between themselves and others, and among families, communities and traditions.</p>	<p>Pupils will understand how to take care of animals taken from their local environment and the need to return them safely after study.</p> <p>Pupils will become familiar with the common names of some fish, amphibians, reptiles, birds and mammals, including those that are kept as pets.</p>	<p>Pupils will be introduced to the basic needs of animals for survival, as well as the importance of exercise and nutrition for humans.</p> <p>Pupils will also be introduced to the processes of reproduction and growth in animals.</p>	<p>Pupils will 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.</p>	<p>Pupils will be introduced to the main body parts associated with the digestive system, for example, and explore questions that help them to understand their special functions.</p> <p>Pupils will also be able to construct and interpret a range of food chains.</p>	<p>Pupils will be able to describe the changes as humans develop to old age, contrasting them with other animals.</p>	<p>Pupils will build on their learning from years 3 and 4 about the main body parts and internal organs 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 will explore the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.</p>
Key Terminology	plants, living, dead, environment, features, changes, similarities, differences, family, community, traditions.	hear, taste, touch, smell, feel, eyes, ears, mouth, nose, sense, carnivore, herbivore, omnivore, animals, mammals, fish, amphibians, reptiles, birds, pets, structure. Names of basic body parts and common animals.	needs, offspring, baby, child, teenager, adult, hygiene, water, food, shelter, egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep, exercise, nutrition.	muscles/names of key muscles e.g. biceps, skeleton/names of bones e.g. tibia, joints/types of e.g. ball and socket, function, protection, movement, support, nutritional groups e.g. protein.	producer, predator, prey, food chain, parts of digestive system e.g. stomach mouth, tongue, teeth, oesophagus, and small and large intestine, types of teeth e.g. molars, functions of each e.g. digest, swallow, break down, grind etc.	puberty, degeneration, adolescence, conditions, womb, hormones	circulatory system and words of parts of this and skeletal/muscular/digestive system, internal organs, drugs-legal/illegal, diet, damage, substances, function
Practical Assessment Criteria	<ul style="list-style-type: none"> I can talk about the features of my own immediate environment and how environments might vary from one another. I can talk about similarities and differences myself and other families, communities and traditions. 	<ul style="list-style-type: none"> I can use my local environment throughout the year to explore and answer questions about animals in their habitat. I can work scientifically by: using observations to compare, contrast and group animals. I can use my senses to compare different textures, sounds and smell. 	<ul style="list-style-type: none"> I can observe how different animals, including humans, grow I can ask questions about what things animals need for survival and what humans need to stay healthy; and suggesting ways to find answers to their questions. 	<ul style="list-style-type: none"> I can identify animals with and without skeletons and observing and comparing their movement. I can research different food groups and how they keep us healthy and design meals based on what I find out. . 	<ul style="list-style-type: none"> I can construct and interpret a variety of food chains, identifying producers, predators and prey. I can discuss my ideas about the digestive system and compare them with models or images. I can find out reasons that damage teeth. 	<ul style="list-style-type: none"> I can research and compare the gestation periods of other animals with humans. I can compare/contrast changes in humans as they age. 	<ul style="list-style-type: none"> I can conduct experiments and collect data to explore the effect of drugs, exercise and diet on the body.
Knowledge Assessment Criteria	<ul style="list-style-type: none"> I can make observations of animals and plants and explain why some things occur, and talk about changes. 	<ul style="list-style-type: none"> I can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. I can identify and name a variety of common animals that are carnivores, herbivores and omnivores. I can describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) I can identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. 	<ul style="list-style-type: none"> I know that that animals, including humans, have offspring which grow into adults. I can describe the basic needs of animals, including humans, for survival (water, food and air). I can describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. 	<ul style="list-style-type: none"> I know that animals, including humans, need the right types and amount of nutrition. I know that they cannot make their own food; they get nutrition from what they eat. I understand that humans and some other animals have skeletons and muscles for support, protection and movement. 	<ul style="list-style-type: none"> I can describe the simple functions of the basic parts of the digestive system in humans. I can identify the different types of teeth in humans and their simple functions. 	<ul style="list-style-type: none"> I can draw a timeline to indicate stages in the growth and development of humans. I understand the changes experienced in puberty. 	<ul style="list-style-type: none"> I can describe the ways in which nutrients and water are transported within animals, including humans. I can identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. I recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.

Living things and their habitats	Foundation Expectations	Y2 Expectations	Y4 Expectations	Y5 Expectations	Y6 Expectations
Overview	Pupils will learn about similarities and differences in relation to places and living things, including animals.	Pupils will be introduced to the idea that all living things have certain characteristics that are essential for keeping them alive and healthy. Pupils will be introduced to the term 'habitat' and 'micro-habitat.' Pupils will 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 will 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 will 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.	Pupils will 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 behaviorists. 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, asking pertinent questions and suggesting reasons for similarities and differences.	Pupils will 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.
Key Terminology	environment, features, changes, similarities, differences, family, community, traditions, habitat.	food chain, source, need, dependence, micro-habitat, living, life processes, dead, characteristics, healthy, natural, food, habitat names- seashore, ocean, etc	classify, key, local/wider environment, environmental change,	life-cycle, naturalist, behavioralist, sexual/asexual reproduction, growth	broad grouping, micro-organism, subdivided, invertebrates, pioneer, classification system, immediate environment
Practical Assessment Criteria	<ul style="list-style-type: none"> I can talk about the features of my own immediate environment and how environments might vary from one another. 	<ul style="list-style-type: none"> I can compare the differences between things that are living, dead, and things that have never been alive. Recording findings and using chart. I can identify and study a variety of plants and animals within their habitat and observe how living things depend on each other. I can raise and answer questions about life processes and my local environment. 	<ul style="list-style-type: none"> I recognise that living things can be grouped in a variety of ways. I can explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. 	<ul style="list-style-type: none"> I can grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. I can observe changes in an animal/plant over a period of time. I can compare how different animals reproduce and grow. 	<ul style="list-style-type: none"> I can use classification systems and keys to identify some animals and plants in my immediate environment. I can research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system.
Knowledge Assessment Criteria	<ul style="list-style-type: none"> I can make observations of animals and plants and explain why some things occur, and talk about changes. 	<ul style="list-style-type: none"> I know 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. I can identify and name a variety of plants and animals in their habitats, including microhabitats. I can 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. 	<ul style="list-style-type: none"> I recognise that environments can change and that this can sometimes pose dangers to living things. 	<ul style="list-style-type: none"> I can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. I can describe the life process of reproduction in some plants and animals. 	<ul style="list-style-type: none"> I can 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. I can give reasons for classifying plants and animals based on specific characteristics.

Physics

Seasonal Change/ Light/Earth and Space	Y1 Expectations	Y3 Expectations	Y5 Expectations	Y6 Expectations
Overview	<p>Seasonal Changes Pupils will observe and talk about changes in the weather and the seasons. Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. Pupils should 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.</p>	<p>Light Pupils will 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. Pupils should look for, and measure, shadows, and find out how they are formed and what might cause the shadows to change. Pupils should think about why it is important to protect their eyes from bright lights. be warned that it is not safe to look directly at the Sun, even when wearing dark glasses.</p>	<p>Earth and Space Pupils will be introduced to a model of the Sun and Earth that enables them to explain day and night. They will 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). 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.</p>	<p>Light Pupils will build on the work on light in year 3, exploring the way that light behaves, including light sources, reflection and shadows. They will talk about what happens and make predictions.</p>
Key Terminology	season, Spring, Summer, Autumn, Winter, changes, day, night, sunrise/set, sky, light, months of the year, weather terminology, changes	darkness, light, shadow, opaque, transparent, blocked, transparent, source, patterns, safety, protect, rays, mirror, reflect, reflective surface, object.	Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune, Sun, star, Solar System, sundial, midday, celestial body, Moon, geocentric, rotation, movement, astronomy	cast, periscope, bent, filters
Practical Assessment Criteria	<ul style="list-style-type: none"> • I can observe changes across the four seasons. • I can observe weather associated with the seasons and how day length varies. 	<ul style="list-style-type: none"> • I can explore how shadows are formed when the light from a light source is blocked by an opaque object. • I can find patterns in the way that the size of shadows change when the position/distance of a light source changes. 	<ul style="list-style-type: none"> • I can compare the time of day at different places on the Earth through internet links and direct communication. • I can create simple models of the solar system and construct simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day. 	<ul style="list-style-type: none"> • I can designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works. • I can investigate the relationship between light sources, objects and shadows by using shadow puppets.
Knowledge Assessment Criteria	<ul style="list-style-type: none"> • I can describe weather associated with the seasons. • I know that day length varies seasonally. 	<ul style="list-style-type: none"> • I recognise that they need light in order to see things and that dark is the absence of light. • I notice that light is reflected from surfaces. • I recognise that light from the sun can be dangerous and that there are ways to protect my eyes. 	<ul style="list-style-type: none"> • I can describe the movement of the Earth, and other planets, relative to the Sun in the solar system. • I can describe the movement of the Moon relative to the Earth. • I can describe the Sun, Earth and Moon as approximately spherical bodies. • I can use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. 	<ul style="list-style-type: none"> • I recognise that light appears to travel in straight lines. • I can 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. • I can 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. • I can use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

Sound	Y4 Expectations
Overview	<p>Pupils should explore and identify the way sound is made through vibration in a range of different objects and musical instruments from around the world; and find out how the pitch and volume of sounds can be changed in a variety of ways.</p> <p>Pupils will work scientifically by: finding patterns in the sounds that are made by different objects/sizes/shapes, also by investigating a variety of different materials to see which provides the best insulation against sound.</p>
Key Terminology	<p>sound, vibration, instruments, pitch, volume, distance, loud, quiet, soft faint, high, low, patterns, travel, ear, increase, decrease, muffle, insulate</p>
Practical Assessment Criteria	<ul style="list-style-type: none"> • I can explore patterns between the pitch of a sound and features of the object that produced it. • I can find patterns between the volume of a sound and the strength of the vibrations that produced it. • I recognise that sounds get fainter as the distance from the sound source increases.
Knowledge Assessment Criteria	<ul style="list-style-type: none"> • I understand how sounds are made, associating some of them with something vibrating. • I recognise that sounds travel through a medium to the ear.

Forces and Magnets, Electricity	Y3 Expectations	Y4 Expectations	Y5 Expectations	Y6 Expectations
Overview	<p>Forces and Magnets Pupils will observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary. Pupils should explore the behavior and everyday uses of different magnets. Pupils should explore 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.</p>	<p>Electricity Pupils will 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.</p>	<p>Forces Pupils will explore falling objects and raise questions about the effects of air resistance. They will 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.</p>	<p>Electricity Pupils will build on their electricity work in year 4, constructing simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors. They will also learn how to represent a simple circuit in a diagram using recognised symbols.</p>
Key Terminology	magnet, poles, magnetic, forces, attract, repel, materials, surfaces, friction, contact,	electricity, construct, circuit, cells, wires, bulbs, buzzers, brighter, dimmer, conductor, insulator, series, metals, materials, safety, component, appliance, lamp, loop, complete, open/closed switch	gravity, air/water resistance, theory, levers, gears, falling, unsupported, pulleys, brakes, moving surfaces,	systematic, variation, voltage, motor,
Practical Assessment Criteria	<ul style="list-style-type: none"> I can observe how magnets attract or repel each other and attract some materials and not others. I can compare how things move on different surfaces. <ul style="list-style-type: none"> I can 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. I can predict whether two magnets will attract or repel each other, depending on which poles are facing. 	<ul style="list-style-type: none"> I can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. I can 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, I recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. 	<ul style="list-style-type: none"> I can identify the effects of air resistance, water resistance and friction, that act between moving surfaces. I recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. 	<ul style="list-style-type: none"> I can 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
Knowledge Assessment Criteria	<ul style="list-style-type: none"> I know that some forces need contact between two objects, but magnetic forces can act at a distance. I can describe magnets as having two poles. I can identify how these properties make magnets useful in everyday items and suggesting creative uses for different magnets. 	<ul style="list-style-type: none"> I can identify common appliances that run on electricity. I can recognise some common conductors and insulators, and associate metals with being good conductors. 	<ul style="list-style-type: none"> I can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. 	<ul style="list-style-type: none"> I can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. I can use recognised symbols when representing a simple circuit in a diagram.

