

Year 3 Science

Objectives	Topics-ideas	Milestone 2
<p>During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: □□asking relevant questions and using different types of scientific enquiries to answer them</p> <p>□□setting up simple practical enquiries, comparative and fair tests</p> <p>□□making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</p> <p>□□gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</p> <p>□□recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>□□reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>□□using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <p>□□identifying differences, similarities or changes related to simple scientific ideas and processes</p> <p>□□using straightforward scientific evidence to answer questions or to support their findings.</p> <p>Living things and their habitats</p> <p>Pupils should be taught to: □ 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.</p> <p>Electricity</p> <p>Pupils should be taught to: □ 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.</p> <p>Forces and Magnets</p> <p>Pupils should be taught to: □ 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.</p>	<p>Term 1 Electricity</p> <p>Term 2 Moving and Growing</p> <p>Helping Plants Grow</p> <p>Term 3 Magnets & Springs Forces</p>	<p>To understand electrical circuits</p> <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. <p>To understand plants</p> <ul style="list-style-type: none"> • Identify and describe the functions of different parts of flowering plants: roots, stem, 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 role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. <p>To understand animals and humans</p> <ul style="list-style-type: none"> • Identify that humans and some animals have skeletons and muscles for support, protection and movement. • 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. <p>To understand movement, forces and magnets</p> <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.

<p>Plants Pupils should be taught to:</p> <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. 		<p>MILESTONE 2 To work scientifically Year 3 & 4</p> <ul style="list-style-type: none"> • Ask relevant questions. • Set up simple, practical enquiries and comparative and fair tests. • Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers. • Gather, record, classify and present data in a variety of ways to help in answering questions. • Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables. • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. • Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests. • Identify differences, similarities or changes related to simple, scientific ideas and processes. • Use straightforward, scientific evidence to answer questions or to support their findings.
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Year 4 Science

Objectives	Topics-ideas	Milestone 2
<p>During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> □□ asking relevant questions and using different types of scientific enquiries to answer them □□ setting up simple practical enquiries, comparative and fair tests □□ making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers □□ gathering, recording, classifying and presenting data in a variety of ways to help in answering questions □□ recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables □□ reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions □□ using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions □□ identifying differences, similarities or changes related to simple scientific ideas and processes □□ using straightforward scientific evidence to answer questions or to support their findings. <p>Animals, including humans Pupils should be taught to: □ 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> <p>Animals, including humans Pupils should be taught to: □ 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> <p>State of matter Pupils should be taught to: □ 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.</p> <p>Rocks Pupils should be taught to: □ 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</p>	<p>Term 1 Materials Rocks and Soils</p> <p>Term 2 Habitats Teeth & Eating</p> <p>Term 3 Sound Light and Shadow</p>	<p>To investigate materials Rocks and Soils</p> <ul style="list-style-type: none"> • Compare and group together different kinds of rocks on the basis of their simple, physical properties. • Relate the simple physical properties of some rocks to their formation (igneous or sedimentary). • Describe in simple terms how fossils are formed when things that have lived are trapped within sedimentary rock. • Recognise that soils are made from rocks and organic matter. <p>States of Matter</p> <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 the temperature at which this happens in degrees Celsius (°C), building on their teaching in mathematics. • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. <p>To investigate living things</p> <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. <p>To understand animals and humans</p> <ul style="list-style-type: none"> • Identify that animals, including humans, need the right types and amounts of nutrition, that they cannot make their own food and they get nutrition from what they eat. • Construct and interpret a variety of food chains, identifying producers, predators and prey. • Identify that humans and some animals have skeletons and muscles for support, protection and movement. • 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. <p>To investigate sound and hearing</p> <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. <p>To understand light and seeing</p> <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

that soils are made from rocks and organic matter.

Light

Pupils should be taught to: □ 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 a solid object □ find patterns in the way that the size of shadows change.

Sound

Pupils should be taught to: □ 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.

light from a light source is blocked by a solid object.

- Find patterns in the way that the size of shadows change.

MILESTONE 2 To work scientifically Year 3 & 4

- Ask relevant questions.
- Set up simple, practical enquiries and comparative and fair tests.
- Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers.
- Gather, record, classify and present data in a variety of ways to help in answering questions.
- Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables.
- Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
- Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests.
- Identify differences, similarities or changes related to simple, scientific ideas and processes.
- Use straightforward, scientific evidence to answer questions or to support their findings.

Objectives	Topics-ideas	Milestone 3
<p>During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: □□planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary □□taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate □□recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs □□using test results to make predictions to set up further comparative and fair tests □□reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations □□identifying scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Year 5 & 6 Animals, including humans Pupils should be taught to: ▪ describe the changes as humans develop to old age. Pupils should be taught to: ▪ 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.</p> <p>Year 5 Properties and changes of material Pupils should be taught to: ▪ 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.</p> <p>Earth and Space Pupils should be taught to: ▪ 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.</p> <p>Forces Pupils should be taught to: ▪ explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</p>	<p>Term 1 Keeping healthy Life Cycles</p> <p>Term 2 Earth, Sun & Moon Forces</p> <p>Term 3 Materials-S, L & G, changing state, irreversible/revers ible</p> <p>Changing Sounds <i>Short unit</i></p>	<p>To understand animals and humans</p> <ul style="list-style-type: none"> • Describe the changes as humans develop to old age. • 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. <p>To understand the Earth’s movement in space</p> <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. <p>To understand movement, forces and magnets</p> <p>Magnets</p> <ul style="list-style-type: none"> • Describe magnets as having two poles. • Predict whether two magnets will attract or repel each other, depending on which poles are facing. <p>Forces</p> <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 effect of drag forces, such as air resistance, water resistance and friction that act between moving surfaces. • Describe, in terms of drag forces, why moving objects that are not driven tend to slow down. • Understand that force and motion can be transferred through mechanical devices such as gears, pulleys, levers and springs. • Understand that some mechanisms including levers, pulleys and gears, allow a smaller force to have a greater effect. <p>To investigate hearing and sound</p> <ul style="list-style-type: none"> • 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.

<ul style="list-style-type: none"> ▪ 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. <p>MILESTONE 3 To work scientifically YEAR 5 & 6</p> <ul style="list-style-type: none"> • Plan enquiries, including recognising and controlling variables where necessary. • Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work. • Take measurements, using a range of scientific equipment, with increasing accuracy and precision. • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models. • Report findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions. • Present findings in written form, displays and other presentations. • Use test results to make predictions to set up further comparative and fair tests. • Use simple models to describe scientific ideas, identifying scientific evidence that has been used to support or refute ideas or arguments. 		<p>To investigate materials</p> <ul style="list-style-type: none"> • Compare and group together everyday materials based on evidence from comparative and fair tests, including their hardness, solubility, conductivity (electrical and thermal), and response to magnets. • Understand how 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, oxidation and the action of acid on bicarbonate of soda.
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Objectives	Topics-ideas	Milestone 3
<p>Year 6</p> <p>Evolution Pupils should be taught to: <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. </p> <p>Light Pupils should be taught to: <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. </p> <p>Electricity Pupils should be taught to: <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. </p> <p>Year 5 & 6</p> <p>Living things and their habitats Pupils should be taught to: <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. Pupils should be taught to: <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 ▪ give reasons for classifying plants and animals based on specific characteristics. </p>	<p>Term 1 Interdependence/microorganisms</p> <p>Term 2 Electricity</p> <p>Term 3 Light Evolution</p>	<p>To investigate living things</p> <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. • Describe how living things are classified into broad groups according to common, observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. • Give reasons for classifying plants and animals based on specific characteristics. <p>To understand animals and humans</p> <ul style="list-style-type: none"> • Describe the changes as humans develop to old age. • 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. <p>To understand electrical circuits</p> <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. <p>To understand light and seeing</p> <ul style="list-style-type: none"> • Understand 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 eyes. • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them, and to predict the size of shadows when the position of the light source changes. • 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. <p>To understand evolution and inheritance</p> <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.