

National curriculum – key stage one

Working scientifically

During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking simple questions and recognising that they can be answered in different ways
- observing closely, using simple equipment
- performing simple tests
- identifying and classifying
- using their observations and ideas to suggest answers to questions
- gathering and recording data to help in answering questions

Year 1 and 2 programme of study

Plants

Y1

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

y2

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

Animals, including humans

Y1

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

y2

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

Everyday materials

Y1

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

y2
 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

Seasonal changes

Pupils should be taught to:

observe changes across the 4 seasons
 observe and describe weather associated with the seasons and how day length varies

Living things and their habitats

explore and compare the differences between things that are living, dead, and things that have never been alive
 identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other
 identify and name a variety of plants and animals in their habitats, including microhabitats
 describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food

<p>Year A</p>	<p><u>Everyday materials</u> Y1</p> <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 	<p><u>Animals, including humans (just animals for this unit)</u> Y1</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, 	<p><u>Plants</u> Y1</p> <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 <p>y2</p> <ul style="list-style-type: none"> observe and describe how seeds and bulbs grow into mature plants
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	<ul style="list-style-type: none"> compare and group together a variety of everyday materials on the basis of their simple physical properties <p>y2</p> <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 	<p>amphibians, reptiles, birds and mammals including pets)</p> <ul style="list-style-type: none"> describe the basic needs of animals, including humans, for survival (water, food and air) 	<ul style="list-style-type: none"> find out and describe how plants need water, light and a suitable temperature to grow and stay healthy 	
Year B	<p><u>Seasonal changes</u></p> <ul style="list-style-type: none"> observe changes across the 4 seasons observe and describe weather associated with the seasons and how day length varies 	<p><u>Animals, including humans (just humans for this unit)</u></p> <p>Y1</p> <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 <p>y2</p> <ul style="list-style-type: none"> notice that animals, including humans, have offspring which grow into adults find out about 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 	<p><u>Living things and their habitats</u></p> <ul style="list-style-type: none"> explore and compare the differences between things that are living, dead, and things that have never been alive describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food 	<p><u>Living things and their habitats</u></p> <ul style="list-style-type: none"> identify that most living things live in habitats to which they are suited 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

National curriculum – key stage Two – Lower Key Stage Two.

Working scientifically

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

asking relevant questions and using different types of scientific enquiries to answer them

setting up simple practical enquiries, comparative and fair tests

making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers

gathering, recording, classifying and presenting data in a variety of ways to help in answering questions

recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables

reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions

using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions

identifying differences, similarities or changes related to simple scientific ideas and processes

using straightforward scientific evidence to answer questions or to support their findings.

Year 3 programme of study

Plants

Pupils should be taught to:

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

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

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 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 an opaque object

find patterns in the way that the size of shadows change

Forces and magnets

compare how things move on different surfaces

notice that some forces need contact between 2 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 2 poles

predict whether 2 magnets will attract or repel each other, depending on which poles are facing

Year 4 programme of study

Living things and their habitats

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

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

States 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

Sound

Pupils should be taught to:

	<p>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</p> <p><u>Electricity</u> 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>Class 3 year A</p>	<p><u>Y3 Plants</u> 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 	<p><u>y4 Animals, including humans</u></p> <ul style="list-style-type: none"> • 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><u>y3 Rocks</u> 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 that soils are made from rocks and organic matter</p>	<p><u>Y4 States of matter</u> 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><u>y3 Forces and magnets</u> compare how things move on different surfaces notice that some forces need contact between 2 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 2 poles</p>

	<p>transported within plants</p> <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 				<p>predict whether 2 magnets will attract or repel each other, depending on which poles are facing</p>
Class 3 Year B	<p><u>y4 Living things and their habitats</u></p> <ul style="list-style-type: none"> • 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><u>y3 Animals, including humans</u></p> <p>Pupils should be taught to:</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><u>y4 Sound</u></p> <p>Pupils should be taught to:</p> <p>identify how sounds are made, associating some of them with something vibrating</p> <p>recognise that vibrations from sounds travel through a medium to the ear</p> <p>find patterns between the pitch of a sound and features of the object that produced it</p> <p>find patterns between the volume of a sound and the strength of the vibrations that produced it</p> <p>recognise that sounds get fainter as the distance from the sound source increases</p>	<p><u>y3 Light</u></p> <p>Pupils should be taught to:</p> <p>recognise that they need light in order to see things and that dark is the absence of light</p> <p>notice that light is reflected from surfaces</p> <p>recognise that light from the sun can be dangerous and that there are ways to protect their eyes</p> <p>recognise that shadows are formed when the light from a light source is blocked by an opaque object</p> <p>find patterns in the way that the size of shadows change</p>	<p><u>y4 Electricity</u></p> <p>Pupils should be taught to:</p> <p>identify common appliances that run on electricity</p> <p>construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</p> <p>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</p> <p>recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</p> <p>recognise some common conductors and insulators, and associate metals with being good conductors</p>
<p>National curriculum – key stage Two – Upper Key Stage Two</p>					
<p>Upper key stage 2 programme of study Working scientifically</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 a degree of trust in results, in oral and written forms such as displays and other presentations
identifying scientific evidence that has been used to support or refute ideas or arguments

Year 5 programme of study

Living things and their habitats

Pupils should be taught to:

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

Animals, including humans

Pupils should be taught to:

describe the changes as humans develop to old age

Properties and changes of materials

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

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

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

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 programme of study

Living things and their habitats

Pupils should be taught to:

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

Animals including humans

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

Evolution and inheritance

Pupils should be taught to:

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

Light

Pupils should be taught to:

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

Electricity

Pupils should be taught to:

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				
Year 5/6 Year A	<u>Y5 Living things and their habitats</u> 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 	<u>Y6 Animals including humans</u> Pupils should be taught to: <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 the changes as humans develop to old age (<u>Animals, including humans</u>) 	<u>Y5 Earth and space</u> Pupils should be taught to: <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 		<u>Y6 Light</u> 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
Years 5 / 6 Year B	<u>Y6 Living things and their habitats</u> Pupils should be taught to: <ul style="list-style-type: none"> describe how living things are classified into broad groups according to common 	<u>Y5 Properties and changes of materials</u> Pupils should be taught to: <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 	<u>Y6 Evolution and inheritance</u> 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 	<u>Y5 Forces</u> Pupils should be taught to: <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 	<u>Y6 Electricity</u> 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

	<p>observable characteristics and based on similarities and differences, including micro-organisms, plants and animals</p> <ul style="list-style-type: none"> • give reasons for classifying plants and animals based on specific characteristics 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 	<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>in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches</p> <p>use recognised symbols when representing a simple circuit in a diagram</p>
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