



## SCIENCE

### KS 1 National Curriculum

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 Progression of Knowledge and Skills

#### Year 1

##### **Sc1/1 Working Scientifically**

- Sc1/1.1 asking simple questions and recognising that they can be answered in different ways  
Sc1/1.2 observing closely, using simple equipment  
Sc1/1.3 performing simple tests  
Sc1/1.4 identifying and classifying  
Sc1/1.5 using their observations and ideas to suggest answers to questions  
Sc1/1.6 gathering and recording data to help in answering questions.

##### **Sc1/2.1 Plants**

- Sc1/2.1a identify and name a variety of common wild and garden plants, including deciduous and evergreen trees  
Sc1/2.1b identify and describe the basic structure of a variety of common flowering plants, including trees

##### **Sc1/2.2 Animals including humans**

- Sc1/2.2a identify and name a variety of common animals including, fish, amphibians, reptiles, birds and mammals  
Sc1/2.2b identify and name a variety of common animals that are carnivores, herbivores and omnivores  
Sc1/2.2c describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)  
Sc1/2.2d identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.

##### **Sc1/3.1 Everyday materials**

- Sc1/3.1a distinguish between an object and the material from which it is made  
Sc1/3.1b identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock  
Sc1/3.1c describe the simple physical properties of a variety of everyday materials  
Sc1/3.1d compare and group together a variety of everyday materials on the basis of their simple physical properties

##### **Sc1/4.1 Seasonal Changes – Covered in stages across the whole year**

- Sc1/4.1a observe changes across the 4 seasons  
Sc1/4.1b observe and describe weather associated with the seasons and how day length varies.

### Year 2 Progression of Knowledge and Skills

#### Year 2

##### **Sc2/1 Working Scientifically**

- Sc2/1.1 asking simple questions and recognising that they can be answered in different ways  
Sc2/1.2 observing closely, using simple equipment  
Sc2/1.3 performing simple tests  
Sc2/1.4 identifying and classifying  
Sc2/1.5 using their observations and ideas to suggest answers to questions  
Sc2/1.6 gathering and recording data to help in answering questions.

##### **Sc2/2.1 Living things and their habitats**

- Sc2/2.1a explore and compare the differences between things that are living, dead, and things that have never been alive



Sc2/2.1b 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

Sc2/2.1c identify and name a variety of plants and animals in their habitats, including microhabitats

Sc2/2.1d 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.

#### **Sc2/2.2 Plants**

Sc2/2.2a observe and describe how seeds and bulbs grow into mature plants

Sc2/2.2b find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

#### **Sc2/2.3 Animals including humans**

Sc2/2.3a notice that animals, including humans, have offspring which grow into adults

Sc2/2.3b find out about and describe the basic needs of animals, including humans, for survival (water, food and air)

Sc2/2.3c describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

#### **Sc2/3.1 Uses of everyday materials**

Sc2/3.1a identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for different uses

Sc2/3.1b compare how things move on different surfaces.

Sc2/3.1c find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching

### **KS2 National Curriculum**

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 Progression of Knowledge and Skills**

#### **Year 3**

##### **Sc3/1 Working Scientifically**

Sc3/1.1 asking relevant questions and using different types of scientific enquiries to answer them

Sc3/1.2 setting up simple practical enquiries, comparative and fair tests

Sc3/1.3 making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers

Sc3/1.4 gathering, recording, classifying and presenting data in a variety of ways to help in answering questions

Sc3/1.5 recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables

Sc3/1.6 reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions

Sc3/1.7 using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions

Sc3/1.8 identifying differences, similarities or changes related to simple scientific ideas and processes

Sc3/1.9 using straightforward scientific evidence to answer questions or to support their findings.



### **Sc3/2.1 Plants**

Sc3/2.1a identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers

Sc3/2.1b 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

Sc3/2.1c investigate the way in which water is transported within plants

Sc3/2.1d explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

### **Sc3/2.2 Animals including humans**

Sc3/2.2a 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

Sc3/2.2b identify that humans and some other animals have skeletons and muscles for support, protection and movement.

### **Sc3/3.1 Rocks**

Sc3/3.1a compare and group together different kinds of rocks on the basis of their appearance and simple physical properties

Sc3/3.1b describe in simple terms how fossils are formed when things that have lived are trapped within rock

Sc3/3.1c recognise that soils are made from rocks and organic matter.

### **Sc3/4.1 Light**

Sc3/4.1a recognise that they need light in order to see things and that dark is the absence of light

Sc3/4.1b notice that light is reflected from surfaces

Sc3/4.1c recognise that light from the sun can be dangerous and that there are ways to protect their eyes

Sc3/4.1d recognise that shadows are formed when the light from a light source is blocked by a solid object

Sc3/4.1e find patterns in the way that the size of shadows change.

### **Sc3/4.2 Forces and Magnets**

Sc3/4.2a compare how things move on different surfaces

Sc3/4.2b notice that some forces need contact between 2 objects, but magnetic forces can act at a distance

Sc3/4.2c observe how magnets attract or repel each other and attract some materials and not others

Sc3/4.2d 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

Sc3/4.2e describe magnets as having 2 poles

Sc3/4.2f predict whether 2 magnets will attract or repel each other, depending on which poles are facing.

## **Year 4 Progression of Knowledge and Skills**

### **Year 4**

#### **Sc4/1 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:

Sc4/1.1 asking relevant questions and using different types of scientific enquiries to answer them

Sc4/1.2 setting up simple practical enquiries, comparative and fair tests

Sc4/1.3 making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers

Sc4/1.4 gathering, recording, classifying and presenting data in a variety of ways to help in answering questions

Sc4/1.5 recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables

Sc4/1.6 reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions

Sc4/1.7 using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions

Sc4/1.8 identifying differences, similarities or changes related to simple scientific ideas and processes

Sc4/1.9 using straightforward scientific evidence to answer questions or to support their findings.



### **Sc4/2.1 All Living Things**

Sc4/2.1a recognise that living things can be grouped in a variety of ways

Sc4/2.1b explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment

Sc4/2.1c recognise that environments can change and that this can sometimes pose dangers to living things.

### **Sc4/2.2 Animals including humans**

Sc4/2.2a describe the simple functions of the basic parts of the digestive system in humans

Sc4/2.2b identify the different types of teeth in humans and their simple functions

Sc4/2.2c construct and interpret a variety of food chains, identifying producers, predators and prey.

### **Sc4/3.1 States of Matter**

Sc4/3.1a compare and group materials together, according to whether they are solids, liquids or gases

Sc4/3.1b 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)

Sc4/3.1c identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

### **Sc4/4.1 Sound**

Sc4/4.1a identify how sounds are made, associating some of them with something vibrating

Sc4/4.1b recognise that vibrations from sounds travel through a medium to the ear

Sc4/4.1c find patterns between the pitch of a sound and features of the object that produced it

Sc4/4.1d find patterns between the volume of a sound and the strength of the vibrations that produced it.

Sc4/4.1e recognise that sounds get fainter as the distance from the sound source increases.

### **Sc4/4.2 Electricity**

Sc4/4.2a identify common appliances that run on electricity

Sc4/4.2b construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers

Sc4/4.2c 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

Sc4/4.2d recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit

Sc4/4.2e recognise some common conductors and insulators, and associate metals with being good conductors.

## **Year 5 Progression of Knowledge and Skills**

### **Year 5**

#### **Sc5/1 Working Scientifically**

Sc5/1.1 planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary

Sc5/1.2 taking measurements, using a range of scientific equipment, with increasing accuracy and precision

Sc5/1.3 recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs

Sc5/1.4 using test results to make predictions to set up further comparative and fair tests

Sc5/1.5 reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results, in oral and written forms such as displays and other presentations

Sc5/1.6 identifying scientific evidence that has been used to support or refute ideas or arguments.

#### **Sc5/2.1 Living Things and their habitats**

Sc5/2.1a describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird

Sc5/2.1b describe the life process of reproduction in some plants and animals.

#### **Sc5/2.2 Animals, including humans**

Sc5/2.2a describe the changes as humans develop to old age.



### Sc5/3.1 Properties and Changes of Materials

- Sc5/3.1a 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
- Sc5/3.1b know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- Sc5/3.1c use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- Sc5/3.1d give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- Sc5/3.1e demonstrate that dissolving, mixing and changes of state are reversible changes
- Sc5/3.1f 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.

### Sc5/4.1 Earth and Space

- Sc5/4.1a describe the movement of the Earth, and other planets, relative to the Sun in the solar system
- Sc5/4.1b describe the movement of the Moon relative to the Earth
- Sc5/4.1c describe the Sun, Earth and Moon as approximately spherical bodies
- Sc5/4.1d use the idea of the Earth's rotation to explain day and night, and the apparent movement of the sun across the sky.

### Sc5/4.2 Forces

- Sc5/4.2a explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- Sc5/4.2b identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- Sc5/4.2c recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect

## Year 6 Progression of Knowledge and Skills

### **Year 6**

#### **Sc6/1 Working Scientifically**

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:

- Sc6/1.1 planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- Sc6/1.2 taking measurements, using a range of scientific equipment, with increasing accuracy and precision
- Sc6/1.3 recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs
- Sc6/1.4 using test results to make predictions to set up further comparative and fair tests
- Sc6/1.5 using simple models to describe scientific ideas
- Sc6/1.6 reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results, in oral and written forms such as displays and other presentations
- Sc6/1.7 identifying scientific evidence that has been used to support or refute ideas or arguments.

#### Sc6/2.1 Living Things and their habitats

- Sc6/2.1a 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
- Sc6/2.1b give reasons for classifying plants and animals based on specific characteristics.

#### Sc6/2.2 Animals including humans

- Sc6/2.2a identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood
- Sc6/2.2b recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function
- Sc6/2.2c describe the ways in which nutrients and water are transported within animals, including humans.

#### Sc6/2.3 Evolution and inheritance

- Sc6/2.3a recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
- Sc6/3.2b recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents



Sc6/2.3c identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

Sc6/4.1 Light

Sc6/4.1a recognise that light appears to travel in straight lines

Sc6/4.1b 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

Sc6/4.1c 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

Sc6/4.1d use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them

Sc6/4.2 Electricity

Sc6/4.2a associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit

Sc6/4.2b 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

Sc6/4.2c use recognised symbols when representing a simple circuit in a diagram