

**Working Scientifically**

**Planning and prediction**

CORE

Explore the world around them and begin to ask simple questions

Recognise that questions can be answered in different ways by observing closely

Make simple predictions if appropriate (based on observations but without an explanation)

**Carrying out the investigation**

CORE

Make own suggestions on how to collect data with support

Able to observe closely using simple equipment

Use simple measurements and equipment (for example, hand lenses, egg timers) to gather data with support

Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them

Talk about what they have done in their investigation, presenting their results and findings in different ways

Perform simple tests with some support

**Recording and classification**

CORE

Gather and record data with support to help answer questions

Draw pictures of an experiment and its results

Help create a graph or chart to record findings

Describe simple observations using words, numbers, pictures, symbols etc

**Reviewing and evaluating**

CORE

Describe observations and ideas, using them to suggest answers to questions

Able to say what they found out and suggest some reasons why they happened

## Programme of Study

### Plants

#### CORE

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

### Animals including humans

#### CORE

Identify and name a variety of common animals that are carnivores, herbivores and omnivores

Identify and name a variety of common animals including fish, amphibians, reptiles, birds, mammals and invertebrates

Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds invertebrates 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

### Everyday materials

#### CORE

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 (such whether they are transparent, translucent, opaque, waterproof, flexible etc)

### Seasonal changes

#### CORE

Observe changes across the four seasons

Observe and describe weather associated with the seasons and how day length varies

## Working Scientifically

### Planning and prediction

#### CORE

Explore the world around them and ask simple questions, recognising they can be answered in different ways

Recognise when simple test is unfair

Make simple predictions if appropriate (based on observations)

### Carrying out the investigation

#### CORE

Use simple measurements and equipment (for example, hand lenses, egg timers, iPads, digital cameras etc) to gather data with increasing confidence

Able to observe closely

Use simple features to compare, identify and classify objects, materials and living things and decide how to group them.

Talk about what they have done in their investigations, beginning to notice patterns and relationships

Perform simple tests

### Recording and classification

#### CORE

Gather and record data to answer questions

Draw labelled pictures of an experiment or observations

Present their findings in a number of ways, including making block graphs, diagrams, simple pictograms or tables to show results

Begin to use simple scientific language in recording their observations

### Reviewing and evaluating

#### CORE

Describe observations confidently, using them to suggest answers to questions

Able to say what they found out and how they found out

Able to say whether results are what they expected

## Programme of Study

### Plants

#### CORE

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

#### CORE

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

### Use of everyday materials

#### CORE

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

Observe and identify forces as 'pushes' or 'pulls'

#### WORKING DEEPER

Notice some forces need contact between two surfaces (Y3)

### Living things and their habitats

#### CORE

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 or micro-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 habitat, including micro-habitats

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

## Working Scientifically

### Planning and prediction

#### CORE

From scientific experiences, begin to raise relevant questions

Start to make own decisions about which type of scientific enquiry to use when answering questions

Set up simple practical enquiries and comparative tests

Set up and carry out simple fair tests with support where needed

Make simple predictions based on everyday knowledge

### Recording and classification

#### CORE

Record findings and observations using simple scientific language

Record findings and observations using simple drawings and labelled diagrams

Record findings using simple keys

Record findings using simple bar charts and tables

Gather, record and present data in a variety of ways to help in answering questions

### Carrying out the investigation

#### CORE

Begin to make careful, systematic observations

Use a range of equipment, including thermometers and data loggers

Where appropriate, take measurements with a range of equipment (including thermometers, data loggers etc) using standard units where possible

## Reviewing and evaluating

### CORE

Use results to draw simple conclusions

Make predictions for new values, suggest improvements to experiments and raise further questions

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

Use straightforward scientific evidence and observations to answer questions or to support their findings

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

## Programme of Study

### Plants

#### CORE

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

#### CORE

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

Describe the basic parts of the skeletal system, observing and comparing animals with and without skeletons

Identify joints and explore how bones and muscles help us to move

### Rocks

#### CORE

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

#### CORE

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 and describe the reflections they see

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

## Forces and magnets

### CORE

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 the forces magnets produce, how they 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 and explain how the poles act

Predict whether two magnets will attract or repel each other, depending on which poles are facing

WE ARE ASTRONAUTS (extra - obj from Y5) describe the movement of the moon relative to the earth

WE ARE ASTRONAUTS (extra - obj from Y5) use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky



## Working Scientifically

### Carrying out the investigation

#### CORE

Make systematic and careful observations

Where appropriate, take accurate measurements from a range of scales using standard units

Use a range of equipment confidently, including thermometers and data loggers

### Planning and prediction

#### CORE

Use different types of scientific enquiries to answer questions

From scientific experiences, ask a range of relevant questions

Set up simple practical enquiries and comparative tests

Set up simple fair tests, identifying variables that will affect results

Make simple predictions based on everyday knowledge

### Recording and classification

#### CORE

Record findings using simple scientific language, drawings and/or labelled diagrams

Record findings using keys, bar charts or tables

Gather, record, classify and present data in a variety of ways to help in answering questions

## Reviewing and evaluating

### CORE

Identify patterns, similarities and differences in data to draw conclusions

Make predictions for new investigations, suggest improvements and raise further questions

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

Use straightforward scientific evidence and results to answer questions or form conclusions

Identify differences, similarities or changes in results related to simple scientific ideas and processes

Use research skills, recognising where secondary sources may help to answer questions that can't be answered through practical investigation

## Programme of Study

### Living things and their habitats

#### CORE

Recognise that living things can be grouped in a variety of ways

Explore and use classification keys to help observe, group, identify and name a variety of living things in their local and wider environment

Recognise that environments can change and this can sometimes pose dangers to living things

Understand the human impact on a variety of habitats

Devise and use a simple key to classify animals and plants

### Animals including humans

#### CORE

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

Recognise how and why we must take good care of our teeth

Construct and interpret a variety of food chains, identifying producers, predators and prey

### States of matter

#### CORE

Based on observations, 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)

Observe and recognise that some materials, eg water, may exist in solid, liquid and gas states

Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature

Observe what happens to a material when it evaporates or condenses

## Sound

### CORE

Identify how different sounds are made, associating some of them with something vibrating

Observe and name a variety of sources of sound, natural and made

Recognise that vibrations from sounds travel through a medium to the ear, noticing that we hear with our ears

Observe, compare and explore how sounds can have different pitches

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

## Electricity

### CORE

Identify common appliances that run on electricity

Recognise and classify appliances as being either mains or battery operated

Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers

Recognise what is needed to make a bulb light in a circuit, identifying whether or not a lamp will light in a range of simple series circuits

To explore the results produced by altering the components of a circuit, making comparative tests

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

Understand that electricity can be dangerous

## Working Scientifically

### Planning and prediction

#### CORE

Use experiences to raise questions

Plan different types of scientific enquiries to answer questions

Plan comparative and fair tests

Recognise and control variables where necessary

Predict the outcome of an investigation providing a simple explanation

### Carrying out the investigation

#### CORE

Take measurements using a range of scientific equipment to make accurate observations

Make their own decisions about what observations to make

Use a range of scientific equipment to make accurate measurements and take repeat readings when appropriate

Use simple or mathematical models to explore scientific concepts or processes

### Recording and classification

#### CORE

Record data and results using scientific diagrams and labels

Record data and results using classification keys

Record data and results using bar and line graphs

## Reviewing and evaluating

### CORE

Report and present findings from enquiries, using relevant scientific language in their explanations

Report and present conclusions from enquiries and recorded results

Consider degree of trust in results, in oral and written forms such as displays and other presentations

Use test results to make predictions to set up further comparative and fair tests

Identify scientific evidence that has been used to support or refute a theory and its ideas or arguments

Describe the discoveries of famous scientists and explore the different ways in which some scientists work

## Programme of Study

### Living things and their habitats

#### CORE

Describe the differences in the life cycle of a mammal, an amphibian, an insect and a bird

Describe the life process of reproduction in some plants and animals

### Animals including humans

#### CORE

Describe the changes as humans develop into old age, including puberty and adolescence

Compare and analyse the gestation periods of different animals

### Properties of changes and materials

#### CORE

Compare and group together everyday materials based on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal) and their 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

#### CORE

Describe the movement of the Earth, and other planets, relative to the Sun in the Solar System

Learn the names of the planets in our Solar System and how they are organised

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

### CORE

Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object

Observe a variety of forces that slow things down, identifying 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

Research, design and make machines that use levers, pulleys, springs and gears



## Working Scientifically

### Planning and prediction

#### CORE

Use experiences & ideas to raise variety 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 fair tests

Identify and manage variables when carrying out fair tests

Recognise when and how to set up comparative tests

Predict the outcome of an investigation providing a scientific explanation

### Carrying out the investigation

#### CORE

Make detailed observations and take measurements precisely and accurately using a range of scientific equipment

Choose the most appropriate equipment to make measurements and explain how to use it accurately

Make their own decisions about what observations to make, interpreting them to develop their explanations

Make their own decisions about what measurements to use and how long to make them for

Take repeat readings and find averages when appropriate

### Recording and classification

#### CORE

Record data and more complex results using scientific diagrams, labels and where needed classification keys

Record and analyse data and more complex results using bar, line or scatter graphs where appropriate

## Reviewing and evaluating

### CORE

Report and present findings from enquiries in a variety of ways, including conclusions and explanations

Consider degree of trust in results, in oral and written forms such as displays and other presentations

Use test results to make predictions to set up further comparative and fair tests

Make own decision on whether to repeat experiments and offer explanations for repeated measurements and results

Identify and use scientific evidence that has been used, or could be used, to support or refute ideas or arguments

Develop research skills from a variety of resources and interpret data

## Programme of Study

### Living things and their habitats

#### CORE

Describe how living things are classified into broad groups or five kingdoms scientifically according to common observable characteristics

To use similarities and differences from observations to classify into groups including micro-organisms, plants and animals

Give reasons for classifying plants and animals based on specific characteristics

Know the five kingdoms of living things include fungi (including moulds and yeast) and that fungi can be helpful or harmful

### Animals including humans

#### CORE

Identify and name the parts of the 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

Understand the need for a healthy, balanced diet and regular exercise

Describe the ways in which nutrients and water are transported within animals, including humans

### Evolution and inheritance

#### CORE

Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago

Know about the scientists who discover fossils and explore evolutionary timescales

Recognise that we inherit characteristics from our parents

Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents

Observe and record data about the differences and similarities in people, including eye colour, hair colour, height and shoe size

Identify how animals and plants are suited to their environment in different ways and that adaptation may lead to evolution, exploring the term 'natural selection'

## Light

### CORE

Recognise that light travels in straight lines

Explain that we see things because light travels in straight lines from light sources to our eyes or from light sources to objects and then to our eyes

Describe how light behaves at different reflective surfaces, suggesting explanations for their findings

Explain how shadows form and why they have the same shape as the objects that cast them

Explore how white light is made of more than one colour and that it can be split up or 'bent'

## Electricity

### CORE

Recall and use recognised symbols when representing a simple circuit in a diagram

Construct and explore simple circuits, recognising from a diagram whether or not it will work

Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells 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

Consider the impact on the environment of making electricity in various ways, looking at alternative forms of production