Science

Year 4

Scientific Enquiry

Raises their own relevant questions about the world around them.

Uses different types of scientific enquiry to answer the questions they raise.

Recognises when and how secondary sources should be used.

Practical Investigation

Starts to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions.

Recognises when a simple fair test is necessary and helps to decide how to set it up.

Begins to look for patterns and decides what data to collect to identify them.

Makes some decisions about what observations to make, how long to make them for and the type of simple equipment that might be used.

Uses a range of equipment, including thermometers and data loggers, appropriately.

Collect data from their own observations and measurements, using notes, simple tables and standard units.

Communicating

Helps to make decisions about how to record and analyse the data.

Gathers, records, classifies and presents data in a variety of ways to help in answering questions.

Uses relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences.

Records findings using a range of methods including drawings, labelled diagrams, keys, bar charts, and tables.

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

Interpreting Evidence

With help looks for changes, patterns, similarities and differences in their data in order to draw simple conclusions.

Uses straightforward scientific evidence to answer questions and to support their findings.

With support, identifies new questions arising from the data, and makes predictions for new values within or beyond the data they have collected.

Finds ways of improving what they have already done.

Animals including humans

Describes the simple functions of the basic parts of the digestive system in humans. .

Identifies the different types of teeth in humans and their simple functions.

Constructs and interprets a variety of food chains, identifying producers, predators and prey.

Could work scientifically by: comparing the teeth of carnivores and herbivores, and suggests reasons for the differences.

All living things

Recognises that living things can be grouped in a variety of ways.

Explores and uses classification keys to help group, identify and name a variety of living things in their local and wider environment.

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

Materials

Compares and groups materials together, according to whether they are solids, liquids or gases.

Observes that some materials change state when they are heated or cooled, and measures or researches the temperature at which this happens in degrees Celsius (°C).

Could work scientifically by: grouping and classifying a variety of different materials; exploring the effect of temperature on substances such as chocolate, butter, cream etc

Identifies the part played by evaporation and condensation in the water cycle and associates the rate of evaporation with temperature.

Sound

Identifies how sounds are made, associating some of them with something vibrating.

Recognises that vibrations from sounds travel through a medium to the ear.

Finds patterns between the pitch of a sound and features of the object that produced it.

Finds patterns between the volume of a sound and the strength of the vibrations that produced it.

Recognises that sounds get fainter as the distance from the sound source increases.

Could work scientifically by: finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses.

Electricity

Identifies common appliances that run on electricity.

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

Identifies 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.

Recognises that a switch opens and closes a circuit and associates this with whether or not a lamp lights in a simple series circuit.

Recognises some common conductors and insulators, and associate metals with being good conductors.

Could work scientifically by: observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit.

Science

Year 3

Scientific Enquiry

Responds to suggestions of how to answer questions about the world around them, and begins to raise their own relevant questions.

Is able to use suggested methods of enquiry.

With support recognises when and how secondary sources should be used.1

Practical Investigation

With support, discusses the most appropriate type of scientific enquiry they might use to answer questions.

Understands what a simple fair test is, and with support helps to set it up.

Begins to look for patterns and with help decides what data to collect to identify them.

With support helps to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used.

Learns how to use new equipment, such as data loggers, appropriately.

With help collects data from their own observations and measurements, using notes, simple tables and standard units.

Communicating

Talks about how the data may be recorded.

With support talks about criteria for grouping, sorting and classifying. Uses simple keys.

Beginning to use scientific language to discuss their ideas and communicate their findings.

With support is beginning to use some of the following methods to record their findings: drawings, labelled diagrams, keys, bar charts, and tables.

Beginning to report findings using basic oral and written explanations, displays or presentations of results.

Beginning to draw and express some conclusions.

Interpreting Evidence

With help, looks for straightforward changes, patterns, similarities and differences in their data in order to draw simple conclusions.

With support, begins to identify new questions arising from the data. With help makes predictions for new values within or beyond the data they have collected.

With support discusses the success of their working methods.

Plants

Identifies and describes the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.

Explores 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.

Investigates the way in which water is transported within plants.

Explores the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Could work scientifically by: comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser etc

Animals including humans

Identifies 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.

Identifies that humans and some other animals have skeletons and muscles for support, protection and movement.

Explores ideas about what would happen if humans did not have skeletons.

*Could work scientifically by: identifying and grouping animals with and without skeletons and observing and comparing their movement.*1

Materials

Compares and groups together different kinds of rocks on the basis of their appearance and simple physical properties.

Describes in simple terms how fossils are formed when things that have lived are trapped within rock.

Recognises that soils are made from rocks and organic matter.

Could work scientifically by: observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time.

Forces

Compares how things move on different surfaces.

Notices that some forces need contact between 2 objects, but magnetic forces can act at a distance.

Observes how magnets attract or repel each other and attract some materials and not others.

Compares and groups together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identifies some magnetic materials.

Describes magnets as having 2 poles.

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

Light

Recognises that they need light in order to see things and that dark is the absence of light.

Notices that light is reflected from surfaces.

Recognises that light from the sun can be dangerous and that there are ways to protect their eyes.

Recognises that shadows are formed when the light from a light source is blocked by a solid object.1

Could work scientifically by: finding patterns in the way that the size of shadows change.

Science

Year 2

Scientific Enquiry

Asks simple questions recognising that they can be answered in different ways.

Uses simple secondary sources to find answers.

Practical Investigation

Observes changes over time.

Uses simple measurements and equipment to gather data and carry out simple tests.

Communicating

With help, records and communicates findings in a range of ways and begins to use simple scientific language.

Talks about what they have found out and how they found it out.

Uses simple features to compare objects, materials and living things and with help, decides how to sort and group them.

Interpreting Evidence

Says whether what happened was what they expected.

With guidance, begins to notice patterns and relationships.

Plants

Observes and describes how seeds and bulbs grow into mature plants.

Finds out and describes how plants need water, light and a suitable temperature to grow and stay healthy.

Animals including humans

Notices that animals, including humans, have offspring which grow into adults.

Finds out about and describes the basic needs of animals, including humans, for survival (water, food and air).

Describes the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

All living things

Explores and compares the differences between things that are living, dead, and things that have never been alive.

Identifies that most living things live in habitats to which they are suited and describes how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.

Identifies and names a variety of plants and animals in their habitats, including microhabitats.

Describes how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identifies and names different sources of food.

Could work scientifically by: sorting and classifying things according to whether they are living, dead or were never alive, and recording their findings using charts, describing how they decided where to place things.

Materials

Identifies and compares the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.

Finds out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Science

Year 1

Scientific Enquiry

Asks questions raised by their own exploration of the world around them.

Draws on their everyday experiences to help answer questions.

Begins to use simple features to compare objects, materials and living things.

Asks people questions to find answers.

Practical Investigation

Responds to prompts by making some suggestions about how to find an answer or make observations.

Uses their senses and simple equipment to make observations.

Communicating

Begins to record data in simple templates provided for them.

Responds to prompts to talk about what they have found out.

Interpreting Evidence

Says what has changed when observing objects, living things or events.

Plants

Identifies and names a variety of common wild and garden plants, including deciduous and evergreen trees.

Identifies and describes the basic structure of a variety of common flowering plants, including trees.

Animals including humans

Identifies and names a variety of common animals including fish, amphibians, reptiles, birds and mammals.

Identifies and names a variety of common animals that are carnivores, herbivores and omnivores.

Describes and compares the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).

Identifies, names, draws and labels the basic parts of the human body and says which part of the body is associated with each sense.

Materials

Distinguishes between an object and the material from which it is made.

Identifies and names a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.

Describes the simple physical properties of a variety of everyday materials.

Compares and groups together a variety of everyday materials on the basis of their simple physical properties.

Could work scientifically by: performing simple tests to explore questions, for example 'What is the best material for ……..'.

Earth and Space

Names the four seasons and understands that they have differences.

Begins to describe the different seasons.

Observes changes across the 4 seasons and identifies what time of year they fall.

Observes and describes weather associated with the seasons and how day length varies.

Could work scientifically by: making tables and charts about the weather.

Science

P10

Scientific Enquiry

Chooses a question which interests them

Recognises a scientific link to everyday experience

Identify a similarity and a difference

Practical Investigation

Suggests how to find a piece of evidence

Select a piece of equipment to make an observation

Communicating

Add own data to a group chart or table

Draw/talk about work in everyday terms without support

Interpreting Evidence

With support identify a change

Respond when a change has occurred

Plants

Collect and/or record a variety of common wild and garden plants e.g. by samples, photographs or drawings

Name/match roots, stem, leaf, and flower

Animals including humans

Collect and record by photographs or drawings a variety of common animals

Name/match head, eye mouth, leg/fin, tail

Can use senses to explore environment

Materials

Can collect objects made of a given material e.g. wooden objects

Choose a criterion for sorting

Earth and Space

Examine a photograph and suggest what season it represents

Collect information about today's weather and record using photographs, symbols or drawings

Forces

Identify/match forces in everyday situations

P9

Practical Investigation

Use simple equipment provided, with help and in a safe manner

Sort materials using wider range of criteria, on the basis of simple physical properties

Make comments about the investigation

Communicating

Respond to teachers questions

Makes a guess

Contribute to a discussion about materials, their simple physical properties and how they can be changed

Describe things in everyday terms

Takes turns in a discussion

Contribute to thought showers

Shows an understanding of comparative language - same, better, more

Draw/talk about work in everyday terms - possibly with support

Interpreting Evidence

Observe changes across the 4 seasons

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

Begins to suggest how to collect evidence to answer questions

Contribute to class or group recording

Say if their guess was correct

Science

P8

Scientific Enquiry

Discusses what they are going to do including how and why.

Asks an increased range of questions e.g. Not all questions begin with "Why?"

Finds out some information from other children or books.

Begins to have awareness of the fact that scientific methods change over

Practical Investigation

Makes a suggestion about what to change.

Recognises hazards and consider safety.

Starts to show an awareness of amounts to use.

Gives reasons why a test was fair.

Gives reasons why a test was not fair.

Refers to something they have already encountered.

Observes more than one feature.

Observes a change.

Sorts a general set according to size.

Communicating

Talks about what they observe.

Displays their collections.

Draws an object and sticks it onto a chart drawn by the teacher.

Interpreting Evidence

Uses own experience when considering evidence.

Describes simply what happened.

Considers, with help, if their reference to something already encountered was correct.

Animals including humans

Knows that it is good to eat a range of foods that help growth, repair and give them energy

All living things

Categorises familiar things as being either alive/not alive

Sequences the life cycles of plants and animals

Starts to think about how plants and animals adapt to their environment

Starts to think about how plants and animals interact with each other in the environment

Materials

Explores and observes similarities, differences, patterns or regular changes in features of objects, or events.

Makes some contribution to planning and evaluation and to recording their findings in different ways.

Identifies a range of common materials and knows about some of their properties.

Sorts materials using simple criteria.

Communicates their observations of materials in terms of their properties.

Describes changes when questioned directly.

Forces

Shows they have observed patterns or regular changes in features of objects.

Makes their own observations of changes of movement that result from actions, and can describe the changes when questioned directly.

Makes some contribution to planning and evaluation and to recording their findings.

Light

Shows they have observed patterns or regular changes in features of objects.

Makes their own observations of changes of light that result from actions, and can describe the changes when questioned directly.

Makes some contribution to planning and evaluation and to recording their findings.

Sound

Shows they have observed patterns or regular changes in features of objects.

Makes their own observations of changes of sound that result from actions, and can describe the changes when questioned directly.

Makes some contribution to planning and evaluation and to recording their findings.

P7 Science

Skills

Talk about what they did

Ask one or two questions

Makes a suggestion about what to do

Show an awareness of treating things in the same way

Consider whether it is a fair test.

Make a general statement

Observe one feature

Say is something changed when asked about it.

Make sets using a very general category

Repeat action, to see if result is repeated.

Gather things together or cut up similar things from catalogue

Use the objects to record with

Describe simply what they did

Consider if their general statement was correct
Compare results

Explain differences

Can find some information from a book – with help?

Carry out a more complex 'finding' task

General Biology

Pupils understand the scientific use of some simple vocabulary, such as before, after, bumpy, grow, eat, move and can communicate related ideas and observations using simple phrases

Chemistry

Actively join in scientific investigations.

Understand the scientific use of some simple vocabulary, such as before, after, bumpy, grow, eat, move.

Communicate related ideas and observations using simple phrases,

Sort materials reliably with given criteria.

Pupils can observe demonstrate simple properties.

Make simple records of their findings.

Begin to make suggestions for planning and evaluating their work

Physics

Understand the scientific use of some simple vocabulary.

Communicate related ideas and observations using simple phrases,

Demonstrate simple properties of light, sound and movement,

Make simple records of their findings.

Begin to make suggestions for planning and evaluating their work,

P6

Skills

Show what they did

Use non-verbal communication

Begin to make generalisations, connections and predictions from regular experiences with in science-based situations

Play with and explore the materials they have been given

Begin to show an awareness of treating things in the same way

Make a simple statement

Show where they found an object.

Show what they did.

Use the objects to record with

Describe or show simply what they did.

Discuss what they are doing giving a reason.

Consider, with help, if their simple statement was correct

Carry out a simple 'finding' task

Carry out a simple test.

General Biology

Recognise the features of living things in their environment and know where they belong.

Chemistry

Explore objects and materials provided in an appropriate way.

Recognise distinctive features of objects,

Begin to make generalisations, connections and predictions from regular experience,

Consistently sort materials according to a given criterion when the contrast is obvious.

Closely observe changes that occur.

Physics

Recognise distinctive features of objects.

Begin to make generalisations, connections and predictions from regular experience.

Identify some appliances that use electricity.

Show they know some sources of sound and light.

Science

P5

Skills

Pupils take part in activities focused on the anticipation of and enquiry into science-based activities

They try out a range of scientific equipment in familiar and relevant situations

They respond to simple scientific questions – 'showing', 'demonstrating', 'trying out', 'responding' etc. by any means appropriate to the pupils' preferred communication and physical abilities - (for some pupils this may mean directing an adult undertaking the task, on their behalf).

General Biology

Pupils take part in activities focused on the anticipation of, and enquiry into, specific Environments.

Chemistry

Anticipate and join in activities.

Match and group objects and materials in terms of simple features or properties,

Indicate the before and after of material changes.
Engage in experimentation.

They try out a range of equipment in familiar and relevant situations,

Respond to simple scientific questions,

Physics

Take part in activities focused on the anticipation of and enquiry into specific environments.

Match objects and materials in terms of single features or properties.

Try out a range of equipment in familiar and relevant situations.

Respond to simple scientific questions.

P4

Skills

Pupils use exploration skills – exploring objects and equipment in science-based situations
Teachers should ensure that the pupils are assessing intended, not accidental, actions

General Biology

Pupils imitate actions involving the main body part, for example, clapping or stamping. They make sounds using their own bodies, for example tapping, singing or vocalising, and imitate or copy sounds.

Chemistry

Explore objects and materials provided.
Changing some materials by physical means and observing the outcomes,

Pupils communicate their awareness of changes.

Physics

Explore objects and materials provided,

Communicate awareness of changes in light, sound or movement.

Make sounds using their own bodies and imitate or copy sounds.

Cause movement by a pushing or pulling action.