

Science:
Skills and
Knowledge

Year 1

Working Scientifically

Over the year, pupils should be given the opportunity to take part in a range of scientific enquiry: observation over time, pattern seeking, identifying & grouping, comparing and research using secondary sources.

Can I ask simple questions and know that there can be more than one answer? (K)
K Can I use simple equipment to look very closely at things so I can understand them better? (K)

Can I test things in simple ways?

Can I identify different things in Science and group similar ones together? (K)

Can I use what I have seen and think to help me when I answer questions?

Can I find information and write it down which helps me when I have to answer questions?

Plants

Can I name some plants that I often see in the garden and countryside as well as some trees that drop their leaves and some that don't?

Can I understand the inside of some plants and trees and how they grow which I can explain to others?

Seasonal Changes

Can I notice and describe the changes that happen from Spring to Summer to Autumn and into Winter?

Do I know what weather we might find in spring, summer, autumn and winter and I know winter days are shorter than summer days?

ALL YEAR

Everyday Materials

Do I know that the name of an object and name the material it is made from will be different?

Do I know the name of some materials I see everyday, including wood, plastic, glass, metal, water, and rock?

Can I describe the simple physical properties of a variety of everyday materials?

Can I compare the simple physical properties of a variety of everyday materials and group similar ones together?

Animals

Can I identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammal?

Do I know the names of animals I often see which eat meat, others that eat vegetables and some that eat both?

Can I describe the different shape and form of a number of animals that I often see including my pets?

Do I know the parts of the human body, can draw a picture of it and name the parts. I know which part of the body lets me hear, taste and smell?

Year 2

Working Scientifically	Plants	Everyday Materials	
<p>Can I ask simple questions and know that there can be more than one answer?</p> <p>Can I use simple equipment to look very closely at things so I can understand them better?</p> <p>Can I test things in simple ways? (K)</p>	<p>Can I describe how seeds and bulbs grow into mature plants?</p> <p>Can I describe what plants need and to grow and stay healthy?</p>	<p>Can I talk about which everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard are suitable for particular uses?</p> <p>Can I talk about how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching?</p>	
	Living Things	Animals	Habitats
<p>Can I identify different things in Science and group similar ones together?</p> <p>Can I use what I have seen and think to help me when I answer questions? (K)</p> <p>Can I find information and write it down which helps me when I have to answer questions? (K)</p>	<p>Can I explore and compare the differences between things that are living, dead, and things that have never been alive?</p> <p>Can I understand the simple food chain and identify and name different places to get food?</p> <p>Can I describe how animals get their food from plants and other animals?</p>	<p>Can I talk about animals and humans babies and how they grow?</p> <p>Can I describe what animals and humans need to survive?</p> <p>Can I describe that exercise, eating the right amounts of different types of food, and hygiene are all important for humans?</p>	<p>Can I identify that most living things live in places which suit their basic needs?</p> <p>Can I describe how different kinds of animals and plants, need different types of places to live and that they depend on each other?</p> <p>Can I identify and name a variety of plants and animals in their habitats, including micro-habitats?</p>

Working Scientifically

Plants

Forces and Magnets

Can I ask relevant questions and use different types of scientific enquiry to answer them? (K)

Can I set up simple practical enquiries and fair tests? (K)

Can I make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment?

Can I gather, record and present data in a variety of ways to help in answering questions?

Can I record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables? (K)

Can I report on findings from enquiries, including oral and written explanations?

Can I use results to draw simple conclusions, make predictions for new values and suggest improvements?

Can I identify differences, similarities or changes related to simple scientific ideas and processes?

Can I use straightforward scientific evidence to answer questions or to support my findings?

Pupils should be introduced to the relationship between structure and function: the idea that every part has a job to do. They should explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction. Pupils can be introduced to the idea that plants can make their own food, but at this stage they do not need to understand how this happens.

Skills:

Can I identify and describe the different parts of a plant?

Can I describe the requirements of plants for life and growth and how these can vary from plant to plant?

Can I describe the way water is transported within plants?

Can I describe the lifecycle of a flowering plant including pollination, seed formation and seed dispersal?

Pupils might work scientifically by: comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser; discovering how seeds are formed by observing the different stages of plant life cycles over a period of time; looking for patterns in the structure of fruits that relate to how the seeds are dispersed. They might observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers.

Pupils should observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary. They should explore the behaviour and everyday uses of different magnets.

Skills:

Can I compare how different things move on different surfaces?

Can I describe how some forces need contact between 2 objects?

Can I describe how magnets act at a distance?

Can I observe how magnets behave?

Can I compare and group together materials that are magnetic?

Can I identify magnetic objects?

Can I describe the properties of magnets?

Pupils might work scientifically by: comparing how different things move and grouping them; raising questions and carrying out tests to find out how far things move on different surfaces and gathering and recording data to find answers their questions; exploring the strengths of different magnets and finding a fair way to compare them; sorting materials into those that are magnetic and those that are not; looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another; identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets.

Rocks and Soils

Skeleton & Nutrition

Light

Linked with work in geography, pupils should explore different kinds of rocks and soils, including those in the local environment.

Skills:

Can I describe in simple terms how fossils are formed when things that have lived are trapped within rock (formation of sedimentary rocks)

Can I recognise that soils are made from rocks and organic matter?

Can I raise and answer questions about the way soils are formed.

Can I compare and group together rocks based on various characteristics?

Can I describe how soils are formed?

Pupils might work scientifically by: observing rocks, including those used in buildings, and exploring how and why they might have changed over time; using a hand lens or microscope to help them to identify and classify rocks according to grains or crystals, and whether they have fossils in them. Pupils might research and discuss the different kinds of living things whose fossils are found in **sedimentary rock** and explore how fossils are formed. Pupils could explore different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together or what changes occur when they are in water.

Pupils should explore different kinds of skeletons as well as rocks and soils, including those in the local environment.

Skills:

Can I identify that animals need to right food and amount of food and that they cannot make their own food?

Can I recognise that animals get their nutrition from the food that they eat?

Can I identify why humans and animals have skeletons and muscles?

Pupils might work scientifically by: looking at dietary requirements for humans or animals and identifying the content of different foods.

Pupils should explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them to answer questions about how light behaves. They should think about why it is important to protect their eyes from bright lights. They should look for, and measure, shadows, and find out how they are formed and what might cause the shadows to change. Pupils should be warned that it is not safe to look directly at the sun, even when wearing dark glasses.

Skills:

Can I explain why we need light to see and that dark is the absence of light?

Can I explain how we see things? i.e. Light is reflected from surfaces

Can I explain why light from the sun can be dangerous and how we protect our eyes?

Can I explain how shadows are formed?

Can I find and describe patterns in the way that the size of shadows changes?

Pupils might work scientifically by: looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.

Year 4

Working Scientifically

Over the year, pupils should be given the opportunity to take part in a range of scientific enquiry: observation over time, pattern seeking, identifying & grouping, comparing and research using secondary sources.

Can I ask relevant questions and use different types of scientific enquiry to answer them?

Can I set up simple practical enquiries, comparative and fair tests?

Can I make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers? (K)

Can I gather, record, classify and presenting data in a variety of ways to help in answering questions? (K)

Can I record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables?

Can I report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions?

Can I use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions?

Can I identify differences, similarities or changes related to simple scientific ideas and processes? (K)

Can I use straightforward scientific evidence to answer questions or to support their findings?

Electricity

Can I identify common appliances that run on electricity?

Can I make and identify the parts of a simple series circuit?

Can I investigate different circuits where a bulb will or will not light up?

Can I recognise what a switch does in a circuit and whether it allows a bulb to light up?

Can I identify insulators and conductors and explain why they do this?

Sound

Can I explain how sounds are made? i.e. Vibrations

Can I recognise that vibrations from sounds travel through a medium to the ear?

Can I find patterns between the pitch of a sound and features of the object that produces it?

Can I find patterns between the volume of a sound and the strength of the vibrations that produced it?

Can I recognise that what happens to sounds as they are moved away from the sound source?

States of Matter

Can I compare and group materials according to whether they are solids, liquids or gases?

Can I observe materials that change state when they are heated or cooled?

Can I measure or research the temperature that a change of state occurs?

Can I identify evaporation/condensation in the water cycle and associate this with the rate of evaporation with temperature?

Habitats

Can I recognise that living things can be grouped in different ways?

Can I use classification keys to identify a variety of living things in the local and wider environment?

Can I recognise that environments can change and that this can sometimes pose a threat to living things?

Animals: Digestion and Teeth

Can I describe the simple functions of the basic parts of the digestive system in humans?

Can I identify the different types of teeth in humans and their simple functions?

Can I construct and interpret a variety of food chains? Identify producers, predators and prey

Year 5

Working Scientifically	Life Cycles and Reproduction	Forces
<p>Can I plan different types of scientific enquiry to answer questions? (K)</p> <p>Can I take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate? (K)</p> <p>Can I record data and results of increasing complexity using scientific diagrams and labels etc? (K)</p> <p>Can I report and present 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?</p> <p>Can I identify scientific evidence that has been used to support or refute ideas or arguments?</p>	<p>Can I describe the differences in the life cycles of a mammal, amphibian, insect and bird?</p> <p>Can I describe the life process of reproduction in some plants and animals?</p>	<p>Can I explain why unsupported objects fall towards the Earth?</p> <p>Can I identify the effects of air resistance? Describe effects of forces that act between moving forces</p> <p>Can I identify the effects of water resistance? Describe effects of forces that act between moving forces</p> <p>Can I identify the effects of friction? Describe effects of forces that act between moving forces</p> <p>Can I recognise that some mechanisms allow a smaller force to have a greater effect? Work with levers, pulleys and gears. Could do through D&T.</p>
Earth and Space	Animals and Growth	Properties and Change: Materials
<p>Can I describe the movement of the Earth and other planets relative to the sun in the solar system?</p> <p>Can I describe the movement of the moon relative to the Earth?</p> <p>Can I describe the shape of the sun, Earth and moon?</p> <p>Can I explain how rotation of the Earth causes day and night and the apparent movement of the sun across the sky?</p>	<p>Can I describe the changes as humans develop to old age?</p>	<p>Can I compare and group together everyday objects on the basis of their properties?</p> <p>Can I identify that some materials will dissolve in a liquid to form a solution?</p> <p>Can I describe how to recover a substance from a solution?</p> <p>Can I use my knowledge of solids, liquids and gases to decide how mixtures might be separated?</p> <p>E.g. Filtering , sieving and evaporation</p> <p>Can I give reasons based on evidence from comparative and fair tests, for the particular use of everyday materials?</p> <p>Can I demonstrate that dissolving, mixing and changes of state are reversible changes?</p> <p>Can I explain that some changes result in the formation of new materials?</p> <p>Can I explain that not all changes are reversible? E.g. Burning, action of acid on bicarbonate of soda</p>

Year 6

Working Scientifically

Electricity

Light

Can I plan different types of scientific enquiry to answer questions? (K)

Can I take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate?
Can I record data and results of increasing complexity using scientific diagrams and labels etc?

Can I report and present 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? (K)
Can I identify scientific evidence that has been used to support or refute ideas or arguments? (K)

Can I explain the brightness of a lamp or volume of a buzzer and the association between the number and voltage of cells used in a circuit?
Can I compare and give reasons for variations in how components function? E.g. Brightness of bulbs, loudness of buzzers and the on/off position of switches
Can I use recognised symbols when representing a simple circuit as a diagram?

Can I recognise and explain how light appears to travel in straight lines?
Can I explain the idea that objects are seen because they give out or reflect light into the eye?
Can I explain how we see objects?
Can I explain why shadows are different shapes?

Animals: Circulation and Transportation

Living Things: Classification

Evolution and Inheritance

Can I identify and name the main parts of the human circulatory system and their functions?
Can I recognise and explain the impact of diet, exercise, drugs and lifestyle have on the way our bodies function?
Can I describe the ways in which nutrients and water are transported with animals, including humans?

Can I describe how living things are classified into broad groups?
Can I give reasons for classifying plants and animals that are based on specific characteristics?

Can I recognise that living things have changed over time?
Can I explain how fossils give us information about living things from long ago?
Can I recognise that off spring of the same kind are not identical to their parents?
Can I explain how plants and animals adapt to their environment?
Can I explain that adaption can lead to evolution?