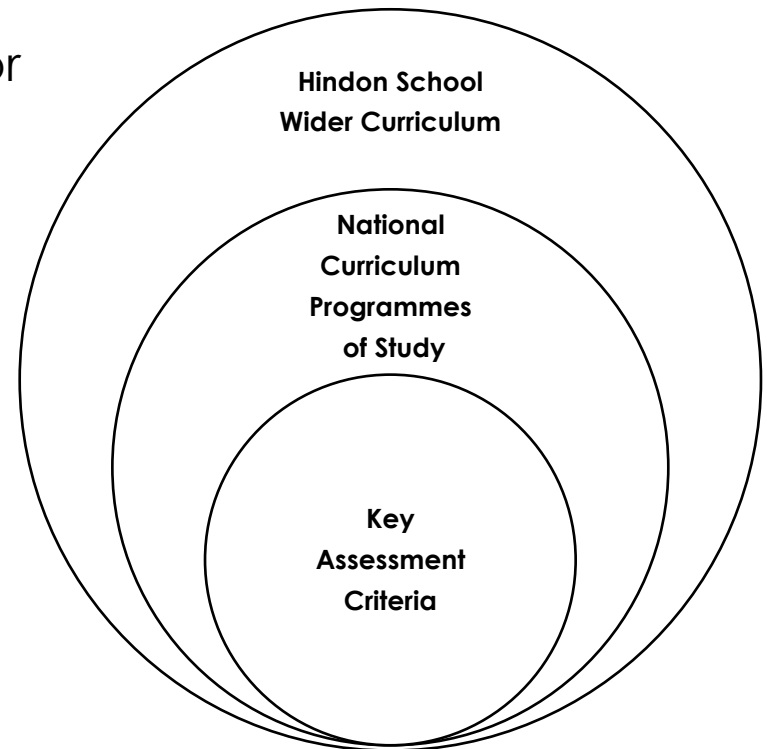
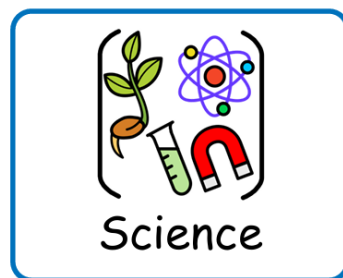
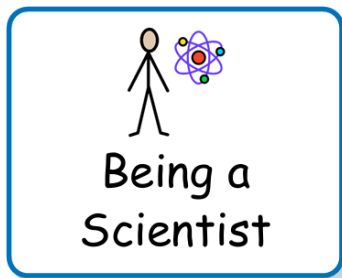


Purpose

The purpose of this document is to outline the key knowledge and skills for each year group, for **Science**.





Being a scientist

The key knowledge and skills for science have been devised in such a way that children are developing as scientists.

The criteria are linked to the statutory requirements of the programme of study. Teachers also use the non-statutory advice as it helps to broaden and enrich scientific learning and progress.

A Year 1 scientist

Working scientifically (Y1 and Y2)

- I know how to ask simple scientific questions.
- I know how to use simple equipment to make observations.
- I know how to carry out simple tests.
- I know how to identify and classify things.
- I know how to explain to others what I have found out.
- I know how to use simple data to answer questions

Biology

Plants

- I know and name a variety of common wild and garden plants.
- I know and name the petals, stem, leaves and root of a plant.
- I know and name the roots, trunk, branches and leaves of a tree.

Animals, including humans

- I know and name a variety of animals including fish, amphibians, reptiles, birds and mammals.
- I classify and know animals by what they eat (carnivore, herbivore and omnivore).
- I know how to sort animals into categories (including fish, amphibians, reptiles, birds and mammals).
- I know how to sort living and non-living things.
- I know how to name the parts of the human body that I can see.
- I know how to link the correct part of the human body to each sense.

Chemistry

Everyday materials

- I distinguish between an object and the material it is made from.
- I know the materials that an object is made from.
- I know the difference between wood, plastic, glass, metal, water and rock.
- I know about the properties of everyday materials.
- I group objects based on the materials they are made from.

Physics

Seasonal changes

- I observe and know about the changes in the seasons.
- I name the seasons and know about the type of weather in each season.

A Year 2 scientist

Working scientifically (Y1 and Y2)

- I know how to ask simple scientific questions.
- I know how to use simple equipment to make observations.
- I know how to carry out simple tests.
- I know how to identify and classify things.
- I know how to explain to others what I have found out.
- I know how to use simple data to answer questions

Biology

Living things and their habitats

- I identify things that are living, dead and never lived.
- I know how a specific habitat provides for the basic needs of things living there (plants and animals).
- I identify and name plants and animals in a range of habitats.
- I match living things to their habitat.
- I know how animals find their food.
- I name some different sources of food for animals.
- I know and can explain a simple food chain.

Plants

- I know how seeds and bulbs grow into plants.
- I know what plants need in order to grow and stay healthy (water, light & suitable temperature).

Animals, including humans

- I know the basic stages in a life cycle for animals, including humans.
- I know what animals and humans need to survive.
- I know why exercise, a balanced diet and good hygiene are important for humans.

Chemistry

Uses of everyday materials

- I identify and name a range of materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard.
- I know why a material might or might not be used for a specific job.
- I know how materials can be changed by squashing, bending, twisting and stretching.

Physics

No content

A Year 3 scientist

Working scientifically (Y3 and Y4)

- I know how to ask relevant scientific questions.
- I know how to use observations and knowledge to answer scientific questions.
- I know how to set up a simple enquiry to explore a scientific question.
- I know how to set up a test to compare two things.
- I know how to set up a fair test and explain why it is fair.
- I make careful and accurate observations, including the use of standard units.
- I know how to use equipment, including thermometers and data loggers to make measurements.
- I gather, record, classify and present data in different ways to answer scientific questions.
- I know how to use diagrams, keys, bar charts and tables; using scientific language.
- I know how to use findings to report in different ways, including oral and written explanations, presentation.
- I know how to draw conclusions and suggest improvements.
- I know how to make a prediction with a reason.
- I know how to identify differences, similarities and changes related to an enquiry.

Biology

Plants

- I know the function of different parts of flowering plants and trees.
- I know what different plants need to help them survive.
- I know how water is transported within plants.
- I know the plant life cycle, especially the importance of flowers.

Animals, including humans

- I know about the importance of a nutritious, balanced diet.
- I know how nutrients, water and oxygen are transported within animals and humans.
- I know about the skeletal system of a human.
- I know about the muscular system of a human.
- I know about the purpose of the skeleton in humans and animals.

Chemistry

Rocks

- I compare and group rocks based on their appearance and physical properties, giving a reason.
- I know how fossils are formed.
- I know how soil is made.
- I know about and explain the difference between sedimentary, metamorphic and igneous rock.

Physics

Light

- I know what dark is (the absence of light).
- I know that light is needed in order to see.
- I know that light is reflected from a surface.
- I know and demonstrate how a shadow is formed.
- I explore shadow size and explain the changes.
- I know the danger of direct sunlight and describe how to keep protected.

Forces and magnets

- I know about and describe how objects move on different surfaces.
- I know how some forces require contact and some do not, giving examples.
- I know about and explain how objects attract and repel in relation to objects and other magnets.
- I predict whether objects will be magnetic and carry out an enquiry to test this out.
- I know how magnets work.
- I predict whether magnets will attract or repel and give a reason.

A Year 4 scientist

Working scientifically (Y3 and Y4)

- I know how to ask relevant scientific questions.
- I know how to use observations and knowledge to answer scientific questions.
- I know how to set up a simple enquiry to explore a scientific question.
- I know how to set up a test to compare two things.
- I know how to set up a fair test and explain why it is fair.
- I make careful and accurate observations, including the use of standard units.
- I know how to use equipment, including thermometers and data loggers to make measurements.
- I gather, record, classify and present data in different ways to answer scientific questions.
- I know how to use diagrams, keys, bar charts and tables; using scientific language.
- I know how to use findings to report in different ways, including oral and written explanations, presentation.
- I know how to draw conclusions and suggest improvements.
- I know how to make a prediction with a reason.
- I know how to identify differences, similarities and changes related to an enquiry.

Biology

Living things and their habitats

- I group living things in different ways.
- I use classification keys to group, identify and name living things.
- I create classification keys to group, identify and name living things (for others to use).
- I know how changes to an environment could endanger living things.

Animals, including humans

- I identify and name the parts of the human digestive system.
- I know the functions of the organs in the human digestive system.
- I identify and know the different types of teeth in humans.
- I know the functions of different human teeth.
- I use food chains to identify producers, predators and prey.
- I construct food chains to identify producers, predators and prey.

Chemistry

States of matter

- I group materials based on their state of matter (solid, liquid, gas).
- I know how some materials can change state.
- I explore how materials change state.
- I measure the temperature at which materials change state.
- I know about the water cycle.
- I know the part played by evaporation and condensation in the water cycle.

Physics

Sound

- I know how sound is made.
- I know how sound travels from a source to our ears.
- I know how sounds are made, associating some of them with vibrating.
- I know the correlation between pitch and the object producing a sound.
- I know the correlation between the volume of a sound and the strength of the vibrations that produced it.
- I know what happens to a sound as it travels away from its source.

Electricity

- I identify and name appliances that require electricity to function.
- I construct a series circuit.
- I identify and name the components in a series circuit (including cells, wires, bulbs, switches and buzzers).
- I know how to draw a circuit diagram.
- I predict and test whether a lamp will light within a circuit.
- I know the function of a switch in a circuit.
- I know the difference between a conductor and an insulator; giving examples of each.

A Year 5 scientist

Working scientifically (Y5 and Y6)

- I know how to plan different types of scientific enquiry.
- I know how to control variables in an enquiry.
- I measure accurately and precisely using a range of equipment.
- I know how to record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
- I use the outcome of test results to make predictions and set up a further comparative and fair tests.
- I report findings from enquiries in a range of ways.
- I know how to explain a conclusion from an enquiry.
- I explain causal relationships in an enquiry.
- I know how to relate the outcome from an enquiry to scientific knowledge in order to state whether evidence supports or refutes an argument or theory.
- I read, spell and pronounce scientific vocabulary accurately.

Biology

Living things and their habitats

- I know the life cycle of different living things, e.g. mammal, amphibian, insect bird.
- I know the differences between different life cycles.
- I know the process of reproduction in plants.
- I know the process of reproduction in animals.

Animals, including humans

- I create a timeline to indicate stages of growth in humans.

Chemistry

Properties and changes of materials

- I compare and group materials based on their properties (e.g. hardness, solubility, transparency, conductivity, [electrical & thermal], and response to magnets).
- I know how a material dissolves to form a solution; explaining the process of dissolving.
- I know and show how to recover a substance from a solution.
- I know how some materials can be separated.
- I demonstrate how materials can be separated (e.g. through filtering, sieving and evaporating).
- I know and can demonstrate that some changes are reversible and some are not.
- I know how some changes result in the formation of a new material and that this is usually irreversible.
- I know about reversible and irreversible changes.
- I give evidenced reasons why materials should be used for specific purposes.

Physics

Earth and space

- I know about and explain the movement of the Earth and other planets relative to the Sun.
- I know about and explain the movement of the Moon relative to the Earth.
- I know and demonstrate how night and day are created.
- I describe the Sun, Earth and Moon (using the term spherical).

Forces

- I know what gravity is and its impact on our lives.
- I identify and know the effect of air resistance.
- I identify and know the effect of water resistance.
- I identify and know the effect of friction.
- I explain how levers, pulleys and gears allow a smaller force to have a greater effect.

A Year 6 scientist

Working scientifically (Y5 and Y6)

- I know how to plan different types of scientific enquiry.
- I know how to control variables in an enquiry.
- I measure accurately and precisely using a range of equipment.
- I know how to record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
- I use the outcome of test results to make predictions and set up a further comparative and fair tests.
- I report findings from enquiries in a range of ways.
- I know how to explain a conclusion from an enquiry.
- I explain causal relationships in an enquiry.
- I know how to relate the outcome from an enquiry to scientific knowledge in order to state whether evidence supports or refutes an argument or theory.
- I read, spell and pronounce scientific vocabulary accurately.

Biology

Living things and their habitats

- I classify living things into broad groups according to observable characteristics and based on similarities & differences.
- I know how living things have been classified.
- I give reasons for classifying plants and animals in a specific way.

Animals, including humans

- I identify and name the main parts of the human circulatory system.
- I know the function of the heart, blood vessels and blood.
- I know the impact of diet, exercise, drugs and life style on health.
- I know the ways in which nutrients and water are transported in animals, including humans.

Evolution and inheritance

- I know how the Earth and living things have changed over time.
- I know how fossils can be used to find out about the past.
- I know about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents).
- I know how animals and plants are adapted to suit their environment.
- I link adaptation over time to evolution.
- I know about evolution and can explain what it is.

Chemistry

No content

Physics

Light

- I know how light travels.
- I know and demonstrate how we see objects.
- I know why shadows have the same shape as the object that casts them.
- I know how simple optical instruments work, e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.

Electricity

- I know how the number & voltage of cells in a circuit links to the brightness of a lamp or the volume of a buzzer.
- I compare and give reasons for why components work and do not work in a circuit.
- I draw circuit diagrams using correct symbols.