Science Learning Intentions

Science Curriculum

Year 1

Within the knowledge and working scientifically elements of the curriculum, children should be exposed to and use the correct scientific vocabulary and continue to apply these in their spoken and written work.

Plants

- Pupils will learn to identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.
- Pupils will identify and describe the basic structure of a variety of common flowering plants, including trees.

Animals including Humans

- Pupils will identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.
- Pupils will identify and name a variety of common animals that are carnivores, herbivores and omnivores
- Pupils will describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)
- Pupils will 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

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

Seasonal Change

- Pupils can observe changes across the four seasons
- Pupils can observe and describe weather associated with the seasons and how day length varies.

Working scientifically

Years 1 and 2

- Pupils will ask their own simple questions and recognising that they can be answered in different ways
- Pupils will observe closely (over long and short periods of time), using simple equipment (such as hand lenses and egg timers)
- Pupils will perform simple comparative tests (practical experiences)
- Pupils will identify, sorting, classifying, grouping and deciding how this should be done (to an extent)
- Pupils will use their observations and ideas to suggest answers to questions (their own and teacher led)
- Pupils will gather and recording data to help in answering questions (recordings can vary depending on the task/ children)

Science Learning Intentions

These types of scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative testing; and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data.

Year 2

Within the knowledge and working scientifically elements of the curriculum, children should be exposed to and use the correct scientific vocabulary and continue to apply these in their spoken and written work.

Living Things and Their Habitats

- Pupils will identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.
- Pupils will 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
- Pupils will identify and name a variety of plants and animals in their habitats, including microhabitats
- Pupils will 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.

Plants

- Pupils will observe and describe how seeds and bulbs grow into mature plants
- Pupils will find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

Animals including Humans

- Pupils will notice that animals, including humans, have offspring which grow into adults
- Pupils will find out about and describe the basic needs of animals, including humans, for survival (water, food and air)
- Pupils will describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Uses of everyday Materials

- Pupils will identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- Pupils will find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching

Working scientifically

Years 1 and 2

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- Pupils will perform simple comparative tests (practical experiences)
- Pupils will identify, sorting, classifying, grouping and deciding how this should be done (to an extent)

Science Learning Intentions

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- Pupils will gather and recording data to help in answering questions (recordings can vary depending on the task/ children)

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Year 3

Plants

- Pupils will identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
- Pupils will 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
- Pupils will investigate the way in which water is transported within plants
- Pupils will explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Animals including Humans

- Pupils will 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
- Pupils will identify that humans and some other animals have skeletons and muscles for support, protection and movement.
- Pupils will 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

Rocks

- Pupils will compare and group together different kinds of rocks on the basis of their appearance and simple physical properties
- Pupils will describe in simple terms how fossils are formed when things that have lived are trapped within rock
- Pupils will recognise that soils are made from rocks and organic matter

Light

- Pupils will recognise that they need light in order to see things and that dark is the absence of light
- Pupils will notice that light is reflected from surfaces
- Pupils will recognise that light from the sun can be dangerous and that there are ways to protect their eyes
- Pupils will recognise that shadows are formed when the light from a light source is blocked by an opaque object
- Pupils will find patterns in the way that the size of shadows change.

Forces and Magnets

- Pupils will compare how things move on different surfaces
- Pupils will notice that some forces need contact between two objects, but magnetic forces can act at a distance

- Pupils will observe how magnets attract or repel each other and attract some materials and not others
- Pupils will 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
- Pupils will describe magnets as having two poles
- Pupils will predict whether two magnets will attract or repel each other, depending on which poles are facing.

Working scientifically

Years 3 and 4

- Pupils will ask their own relevant questions and using different types of scientific enquiries to answer them
- Pupils will set up simple practical enquiries, comparative and fair tests and understanding why this is necessary
- Pupils will make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- Pupils will gather, 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
- Pupils will report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- Pupils will use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- Pupils will identify differences, similarities or changes related to simple scientific ideas and processes
- Pupils will use straightforward scientific evidence to answer questions or to support their findings.
- Pupils will also need to start to spell related scientific words accurately.

These types of scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; simple comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data.

Year 4

Living things and their habitat

- Pupils will recognise that living things can be grouped in a variety of ways
- Pupils will explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment
- Pupils will recognise that environments can change and that this can sometimes pose dangers to living things.

Animals including humans

- Pupils will describe the simple functions of the basic parts of the digestive system in human

- Pupils will identify the different types of teeth in humans and their simple function

Science Learning Intentions

- Pupils will construct and interpret a variety of food chains, identifying producers, predators and prey

States of matter

- Pupils will compare and group materials together, according to whether they are solids, liquids or gases
- Pupils will 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)
- Pupils will identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Sound

- Pupils will identify how sounds are made, associating some of them with something vibrating
- Pupils will recognise that vibrations from sounds travel through a medium to the ear
- Pupils will find patterns between the pitch of a sound and features of the object that produced it
- Pupils will find patterns between the volume of a sound and the strength of the vibrations that produced it
- Pupils will recognise that sounds get fainter as the distance from the sound source increases.

Electricity

- Pupils will identify common appliances that run on electricity
- Pupils will construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
- Pupils will 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
- Pupils will recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
- Pupils will recognise some common conductors and insulators, and associate metals with being good conductors.

Working scientifically

Years 3 and 4

- Pupils will ask their own relevant questions and using different types of scientific enquiries to answer them
- Pupils will set up simple practical enquiries, comparative and fair tests and understanding why this is necessary
- Pupils will make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- Pupils will gather, 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
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- Pupils will identify differences, similarities or changes related to simple scientific ideas and processes
- Pupils will use straightforward scientific evidence to answer questions or to support their findings.
- Pupils will also need to start to spell related scientific words accurately.

These types of scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; si mple comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data.

Year 5

Within the knowledge and working scientifically elements of the curriculum, children should be exposed to and use the correct scientific vocabulary and continue to apply these in their spoken and written work.

Living things and their habitat

- Pupils will describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
- Pupils will describe the life process of reproduction in some plants and animals

Animals Including humans

- Pupils will describe the changes as humans develop to old age.

Properties and changes of materials

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

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- Pupils will describe the movement of the Earth, and other planets, relative to the Sun in the solar system
- Pupils will describe the movement of the Moon relative to the Earth
- Pupils will describe the Sun, Earth and Moon as approximately spherical bodies
- Pupils will use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky

Forces

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

Working scientifically

- Pupils will plan different types of scientific enquiries to answer their own and asked questions, including recognising and controlling variables where necessary
- Pupils will take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- Pupils will record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- Pupils will use test results to make predictions to set up further comparative and fair tests
- Pupils will 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
- Pupils will identify scientific evidence that has been used to support or refute ideas or arguments

These types of scientific enquiry should include: observing over different periods of time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using a wide range of secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data.

Year 6

Within the knowledge and working scientifically elements of the curriculum, children should be exposed to and use the correct scientific vocabulary and continue to apply these in their spoken and written work.

Animals Including humans

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

Science Learning Intentions

Living things and their habitat

- Pupils will describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals
- Pupils will give reasons for classifying plants and animals based on specific characteristics

Evolution and inheritance

- Pupils will recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
- Pupils will recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
- Pupils will identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

Light

- Pupils will recognise that light appears to travel in straight lines
- Pupils will 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
- Pupils will 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
- Pupils will use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

Electricity

- Pupils will associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- Pupils will 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
- Pupils will use recognised symbols when representing a simple circuit in a diagram.

<u>Working scientifically</u>

- Pupils will plan different types of scientific enquiries to answer their own and asked questions, including recognising and controlling variables where necessary
- Pupils will take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- Pupils will record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
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