Scientific Enquiry Progression

During each milestone, the pupils are taught to use the following practical scientific methods, processes and skills through the teaching of the Science programme of study content:

Scientific Enquiry

Year 1 & 2

- Asking simple questions and recognising that they can be answered in different ways.
- Observing closely, using simple equipment.
- Performing simple tests.
- Identifying and classifying.
- Using their observations and ideas to suggest answers to questions.
- Gathering and recording data to help in answering questions.

Year 3 & 4

- Describe asking relevant questions and using different types of scientific enquiries to answer them.
- Setting up simple practical enquiries, comparative and fair tests.
- Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
- Gathering, 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.
- Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
- Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
- Identifying differences, similarities or changes related to simple scientific ideas and processes.
- Using straightforward scientific evidence to answer questions or to support their findings.

Year 5 & 6

- Compare planning different types of scientific enquiries to answer questions, including recognising and controlling variables if necessary.
- Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings if appropriate.
- Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
- Using test results to make predictions to set up further comparative and fair tests.
- Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.
- Identifying scientific evidence that has been used to support or refute ideas or arguments.

Carlton Colville Primary

Science – EYFS Content Breadth and Progression

Our Science curriculum is taught within EYFS topics, as part of the daily continuous provision and during adult enhanced activities.

Three and Four Year Olds

Understanding the World

- Use all their senses in hands-on exploration of natural materials.
- Explore collections of materials with similar and/or different properties.
- Talk about what they see, using a wide vocabulary.
- Begin to make sense of their own life-story and family's history.
- Plant seeds and care for growing plants.
- Understand the key features of the life cycle of a plant and an animal.
- Begin to understand the need to respect and care for the natural environment and all living things.
- Explore and talk about different forces they can feel.
- Talk about the differences between materials and changes they notice.

Reception

Understanding the World

- Explore the natural world around them.
- Describe what they see, hear and feel while they are outside.
- Recognise some environments that are different to the one in which they live.
- Understand the effect of changing seasons on the natural world around them.

Early Learning Goal

Managing Self

- Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.

The Natural World

- Explore the natural world around them, making observations and drawing pictures of animals and plants.
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Vocabulary Concepts

Key concepts the children will learn during the year include:

Change
Similar
Different
Investigate
Bones
Skeleton
Lifecycle
Leaf
Flower
Grow
Recycling
Texture
Environment
Changes

Carlton Colville Primary

Science – Year 1 Content Breadth and Progression

The key indicators and vocabulary concepts of our year 1 science curriculum are highlighted below.

Biology- Understand Plants

- Identify and describe the basic structure of a variety of common flowering plants, including roots, stem/trunk, leaves and flowers.

Biology- Understand Animals and Humans

- Identify and name a variety of common animals that are carnivores, herbivores and omnivores.
- Describe and compare the structure of a variety of commons animals (birds, fish, amphibians, reptiles, mammals and invertebrates, including pets)
- Identify, name, draw and label the basic parts of the human body and associates which part of the body is associated with each sense.
- Notice that animals. Including humans, have offspring which grow into adults.

Biology- Investigate Living Things

- 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.
- Identify and name a variety of plants and animals in their habitats, including micro-habitats.

Biology- Understand Evolution and Inheritance

- Identify how humans resemble their parents in many features.

Chemistry- Investigate Materials

- 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.
- Identify and compare the suitability of a variety of everyday materials. Including wood, metal, plastic, glass, brick/rock and paper/cardboard, for particular uses.

Physics- Understand the Earth's movement in Space

- Observe changes across the four seasons.

Vocabulary Concepts

Key concepts the children will learn during the year include:

Question
Equipment
Measure
Fish
Reptiles
Mammals
Amphibians
Birds
Roots
Stem/Trunk
Carnivore
Herbivore
Omnivore
Senses
Habitat
Materials

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Science – Year 2 Content Breadth and Progression

The key indicators and vocabulary concepts of our year 2 science curriculum are highlighted below.

Biology- Understand Plants

- Identify and name a variety of common plants, wild plants and trees and those classified as deciduous and evergreen.
- 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.

Biology- Understand Animals and Humans

- Identify and name a variety of common animals that are birds, fish, amphibians, reptiles, mammals and invertebrates.
- Investigate 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.

Biology- Investigate Living Things

- Explore and compare the differences between things that are living, that are dead and that have never been alive.
- 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.

Chemistry- Investigate Materials

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

Vocabulary Concepts

Key concepts the children will learn during the year include:

Observe
Record
Compare
Survival
Exercise
Hygiene
Light
Growth
Food Chain
Predator
Prey
Waterproof
Absorbent
Transparent
Deciduous
Evergreen

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Science – Year 3 Content Breadth and Progression

The key indicators and vocabulary concepts of our year 3 science curriculum are highlighted below.

Biology- Understand Plants

- Identify and describe the functions of different parts of flowering plants; stem, roots, 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 role of flowers in life cycles of flowering plants, including pollination, seed formation and seed dispersal.

Biology- Understand Animals and Humans

- Identify that animals, including humans, need the right types and amounts of nutrition, and that they cannot make their own food and they get nutrition from what they eat.
- Identify that humans and some animals have skeletons and muscles for support, protection and movement.

Chemistry- Investigate Materials (Rocks and Soils)

- Compare and group together different kinds of rocks on the basis of their simple, physical properties
- Relate the simple physical properties of some rocks to their formation (igneous or sedimentary)
- Describe in simple terms how fossils are formed when things that have lived are trapped within sedimentary rocks.
- Recognise that soils are made from rocks and organic matter.

Physics- Understand Movement, Forces and Magnets

- Compare how things move on different surfaces.
- Notice that some forces need contact between two objects and some forces act at a distance.
- Observe how magnets 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.
- Predict whether two magnets will attract or repel each other, depending on which poles are facing.

Physics- Understand Light and Seeing

- 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.
- Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.
- Recognise that shadows are formed when light from a light source is blocked by a solid object.
- Find patterns in the way that the size of shadows change.

Vocabulary Concepts

Key concepts the children will learn during the year include:

Fair Test
Accurate
Conclusion
Predictions
Skeleton
Movement
Reproduction
Nutrition
Pollination
Igneous
Sedimentary
Metamorphic
Fossil
Reflective
Transparent
Magnetic

Carlton Colville Primary

Science – Year 4 Content Breadth and Progression

The key indicators and vocabulary concepts of our year 4 science curriculum are highlighted below.

Biology- Understand Animals and Humans

- Identify that animals, including humans, need the right types and amounts of nutrition, and that they cannot make their own food and they get nutrition from what they eat.
- Construct and interpret a variety of food chains, identify producers, predators and prey.
- 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.

Biology- Investigate Living Things

- Recognise that living things can be grouped in a variety of ways.
- Explore and use classification keys.
- Recognise that environments can change and that this can sometimes pose dangers to specific habitats.

Chemistry- Investigate Materials (States of Matter)

- 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 the temperatures at which this happens in degrees Celsius, building on their teaching in mathematics.
- Identify the parts played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Physics- Investigate Sound and Hearing

- Identify how sounds are made, associating some of them with something vibrating.
- Recognise that vibrations from sound travel through a medium to the ear.

Physics- Understand Electrical Circuits

- Identify common appliances that run on electricity.
- Construct a simple series electrical circuit, identifying and naming basic parts, including cells, wires, bulbs, switches and buzzers.
- 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.
- 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.

Vocabulary Concepts

Key concepts the children will learn during the year include:

Enquiry
Teeth
Digestive System
Environment
Classification
Solid
Liquid
Gas
Evaporation
Condensation
Temperature
Vibrate
Pitch
Series Circuit
Conductors
Insulators

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Science – Year 5 Content Breadth and Progression

The key indicators and vocabulary concepts of our year 5 science curriculum are highlighted below.

Biology- Understand Animals and Humans

- Describe the changes as humans develop to old age.

Biology- Investigate Living Things

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

Physics- Understand Movement, Forces and Magnets

- Describe magnets as having two poles.
- Predict whether two magnets will attract or repel each other, depending on which poles are facing.
- Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.
- Identify the effect of drag forces such as air resistance, water resistance and friction that act between moving surfaces.
- Understand that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Physics- Understand Light and Seeing

- Understand that light appears to travel in straight lines
- Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eyes
- Use the idea that light travels in straight lines to explain why shadows have the shame shape as the objects that cast them, and to predict the size of shadows when the position of the light source changes.
- Explain that we see things because light travels from light sources to our eyes or to objects and then to our eyes.

Physics- Understand the Earth's Movement in Space

- Describe the movement of the earth, and other planets, relative to the sun in the solar system.
- 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.

Vocabulary Concepts

Key concepts the children will learn during the year include:

Diagrams
Evidence
Support
Systematic
Lifecycle
Reproduction
Axis
Orbit
Star Constellation
Reflect
Light Source
Air Resistance
Friction
Gravity
Newton

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Science – Year 6 Content Breadth and Progression

The key indicators and vocabulary concepts of our year 6 science curriculum are highlighted below.

Biology- Understand Animals and Humans

- Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.
- Recognise the importance of diet, exercise, drugs and lifestyle on the way the human body functions.
- Describe the ways in which nutrients and water are transported within animals, including humans.

Biology- Investigate Living Things

- Describe how living things are classified into broad groups according to common observable characteristics.
- Give reasons for classifying plants and animals based on specific characteristics.

Biology- Evolution and Inheritance

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

Chemistry- Investigate Materials

- Compare and group together everyday materials based on evidence from comparative and fair tests, including their hardness, solubility, conductivity (electrical and thermal) and response to magnets
- Understand how 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, oxidisation and the action of acid on bicarbonate of soda.

Physics- Investigate Sound and Hearing

- 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.

Physics- Understand Electrical Circuits

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

Vocabulary Concepts

Key concepts the children will learn during the year include:

Variables
Quantitative
Qualitative
Circulatory
Oxygenated
Deoxygenated
Vertebrates
Invertebrates
Micro-organisms
Adaptation
Inheritance
Evolution
Dissolve
Solution
Reversible change
Current
Resistance

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