St. Catherine's Catholic Primary School

Our Science Learning Journey

Intent

Science teaching at St. Catherine's Catholic Primary School aims to give all the children a strong understanding of the world around them whilst acquiring specific skills and knowledge to help them to think scientifically, to gain an understanding of scientific processes and also an understanding of the uses and implications of Science, today and for the future.

The Scientific area of learning is concerned with increasing pupils' knowledge and understanding of our world, and with developing skills associated with Science as a process of enquiry. It will develop the natural curiosity of the child, encourage respect for living organisms and the physical environment and provide opportunities for critical evaluation of evidence.

In conjunction with the aims of the National Curriculum, our Science teaching offers opportunities for children to:

- develop scientific knowledge and conceptual understanding through the specific disciplines of Biology, Chemistry and Physics;
- develop understanding of the nature, processes and methods of Science through different types of science enquiries that help them to answer scientific questions about the world around them;
- be equipped with the scientific knowledge required to understand the uses and implications of Science, today and for the future.
- develop the essential scientific enquiry skills to deepen their scientific knowledge.
- use a range of methods to communicate their scientific information and present it in a systematic, scientific manner, including I.C.T., diagrams, graphs and charts.
- develop a respect for the materials and equipment they handle with regard to their own, and other children's safety.
- develop an enthusiasm and enjoyment of scientific learning and discovery.

Implementation

Year 1

Term	Theme
Autumn 1	Animals including Humans
Autumn 2	Everyday Materials
Spring 1	
Spring 2	Seasonal Changes
Summer 1	
Summer 2	Plants

Year 2

Term	Theme
Autumn 1	Animals including humans – life cycles
Autumn 2	Uses of everyday materials
Spring 1	
Spring 2	Living things and their habitats
Summer 1	
Summer 2	Plants

Year 3

Term	Theme
Autumn 1	Animals including humans
Autumn 2	Light & Dark
Spring 1	Forces & Magnets
Spring 2	Rocks
Summer 1	Plants
Summer 2	

Year 4

Term	Theme
Autumn 1	Living things and their habitats
Autumn 2	Animals including humans
Spring 1	Sound
Spring 2	Electricity
Summer	States of Matter

Year 5

Term	Theme
Autumn 1	Living things and their habitats
Autumn 2	Animals including humans
Spring 1	Earth & Space
Spring 2	Forces
Summer	Properties & Changes of Materials

Year 6

Term	Theme
Autumn 1	Living things and their habitats
Autumn 2	Animals including humans
Spring 1	Light
Spring 2	Electricity
Summer	Evolution & Inheritance

We implement a curriculum that is progressive throughout the whole school. We ensure that we give full coverage of the "National Curriculum programmes of study for Science" and "Understanding of the World in the Early Years Foundation Stage". Where possible, Science is linked to class topics. Science is taught as discrete units and lessons where needed to ensure coverage.

Throughout the programmes of study, the children will acquire and develop the key knowledge that has been identified within each unit and across each year group, as well as the application of scientific skills. We ensure that the Working Scientifically skills are built-on and developed throughout children's time at the school so that they can apply their knowledge of science when using equipment, conducting experiments, building arguments and explaining concepts confidently and continue to ask questions and be curious about their surroundings.

- Teachers find opportunities to develop children's understanding of their surroundings by accessing outdoor learning and workshops with experts.
- Children are offered a wide range of extra-curricular activities, visits, and visitors to complement and broaden the curriculum. These are purposeful and link with the knowledge being taught in class.
- Regular events, such as Science Week or project days, such as Nature Day, allow all pupils to work off-timetable, to provide broader provision and the acquisition and application of knowledge and skills. These events often involve families and the wider community.
- We build upon the learning and skill development of the previous years. As the children's knowledge and understanding increases, and they become more proficient in selecting, using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence.
- Working Scientifically skills are embedded into lessons to ensure these skills are being developed throughout the children's school career and new vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the topics.
- Teachers demonstrate how to use scientific equipment, and the various Working Scientifically skills in order to embed scientific understanding. Teachers find opportunities to develop children's understanding of their surroundings by accessing outdoor learning and workshops with experts.

Impact

The success of Science at St. Catherine's Catholic Primary School results in a fun, engaging, high-quality Science education that provides children with the foundations for understanding the world. The impact and measure of this is to ensure children not only acquire the appropriate age related knowledge linked to the science curriculum, but also skills which equip them to progress from their starting points, and within their everyday lives. This is, in turn, reflected in standards achieved against the National Curriculum outcomes

Year R

	A UNIQUE CHILD: OBSERVING WHAT A CHILD IS LEARNING	ENABLING ENVIRONMENTS: what adults could provide
22-36 months- **Please note a child with SEND may be working at this level or below throughout Year R.**	•Enjoys playing with small-world models such as a farm, a garage, or a train track. •Notices detailed features of objects in their environment.	•Make use of outdoor areas to give opportunities for investigations of the natural world, for example, provide chimes, streamers, windmills and bubbles to investigate the effects of wind. •Provide story and information books about places, such as a zoo or the beach, to remind children of visits to real places.
30-50 months	•Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world. •Can talk about some of the things they have observed such as plants, animals, natural and found objects. •Talks about why things happen and how things work. •Developing an understanding of growth, decay and changes over time. •Shows care and concern for living things and the environment.	•Use the local area for exploring both the built and the natural environment. •Provide opportunities to observe things closely through a variety of means, including magnifiers and photographs. •Provide play maps and small world equipment for children to create their own environments. •Teach skills and knowledge in the context of practical activities, e.g. learning about the characteristics of liquids and solids by involving children in melting chocolate or cooking eggs.
40-60 months Early Learning Goal	•Looks closely at similarities, differences, patterns and change. **Early Learning Goal** **Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another.** **They make observations of animals and plants and explain why some things occur, and talk about changes.**	•Give opportunities to record findings by, e.g. drawing, writing, making a model or photographing. •Provide stories that help children to make sense of different environments. •Provide stimuli and resources for children to create simple maps and plans, paintings, drawings and models of observations of known and imaginary landscapes. •Give opportunities to design practical, attractive environments, for example, taking care of the flowerbeds or organising equipment outdoors.

St Catherine's Catholic Primary School Science Curriculum

Overview KNOWLEDGE

Not in order of teaching

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Plants	Plants	Plants			
Animals, including Humans	Animals, including humans	Animals, including humans	Animals, including humans	Animals, including humans	Animals, including humans
Everyday Materials	Uses of everyday materials	Rocks and Soils	States of Matter	Properties and changes of materials	
	Living things and their habitats		Living things and their habitats	Living things and their habitats	Living things and their habitats
		Light and Shadow			Light
Seasonal Changes				Earth and Space	
		Forces and Magnets		Forces	
			Sound		
			Electricity		Electricity
		(Fossils)			Evolution and Inheritance

Materials

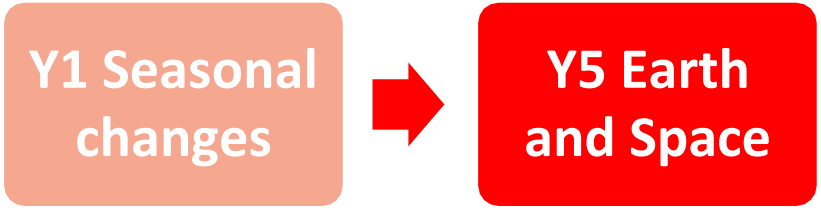
Y1 - Everyday Materials → **Y2 - Uses of Everyday Materials** → **Y3 - Rocks** → **Y4 - States of Matter** → **Y5 - Properties and Changes of Materials**

Y1 Everyday Materials	Y2 Uses of Everyday Materials	Y3 Rocks	Y4 States of Matter	Y5 States of Matter
❖ 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, paper and cardboard for particular uses ❖ find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twi sting and stretching.	❖ compare and group together different kinds of rocks on the basis of their appearance and simple physical properties ❖ recognise that soils are made from rocks and organic 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 or research the temperature at which this happens in degrees Celsius (°C) ❖ identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	❖ 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 ❖ know that 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 and the action of acid on ❖ bicarbonate of soda.

Plants

Y1 Plants	Y2 Plants	Y3 Plants
❖ identify and name a variety of common wild and garden plants, including deciduous and evergreen trees ❖ identify and describe the basic structure of a variety of common flowering plants, including trees.	❖ 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.	❖ identify and describe the functions of different parts of flowering plants: roots, stem/trunk, 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 part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Earth and Space



Y1 Seasonal Change	Y5 Earth and Space
❖ observe changes across the four seasons ❖ observe and describe weather associated with the seasons and how day length varies.	❖ 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.

Living Things and Their Habitats

Y2 Living things and their habitats	Y4 Living things and their habitats	Y5 Living things and their habitats	Y6 Living things and their habitats

Y2
Living things and their habitats

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

Y4
Living things and their habitats

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

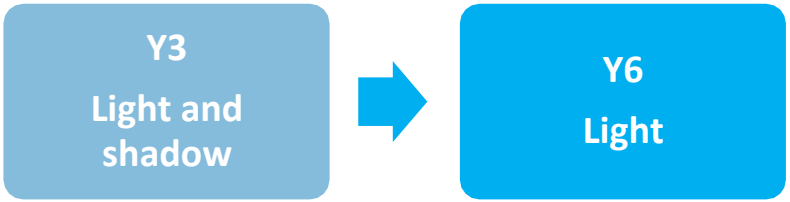
Y5
Living things and their habitats

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

Y6
Living things and their habitats

- 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
- give reasons for classifying plants and animals based on specific characteristics.

Light



Y3 Light and Shadow	Y6 Light
❖ 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 the light from a light source is blocked ❖ by an opaque objects ❖ find patterns in the way that the size of shadows change.	❖ Recognise 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 eye ❖ 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 ❖ use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

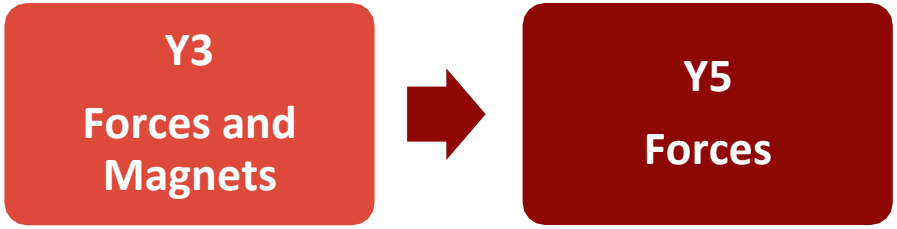
Electricity

Y4
Electricity

Y6
Electricity

Y4 Electricity	Y6 Electricity
❖ identify common appliances that run on electricity ❖ construct a simple series electrical circuit, identifying and naming its 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.	❖ 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.

Light



Y3 Force and Magnets	Y5 Forces
❖ compare how things move on different surfaces ❖ notice that some forces need contact between two objects, but magnetic forces can 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.	❖ explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object ❖ identify the effects of air resistance, water resistance and friction, that act between moving surfaces ❖ recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

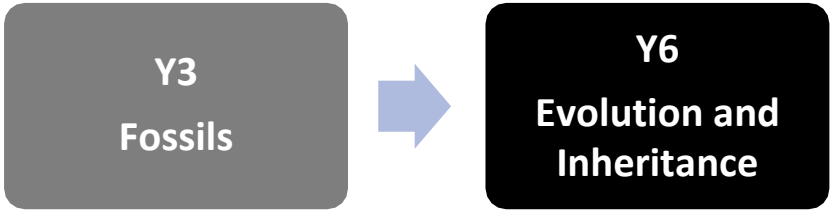
Sound

Y4

Sound

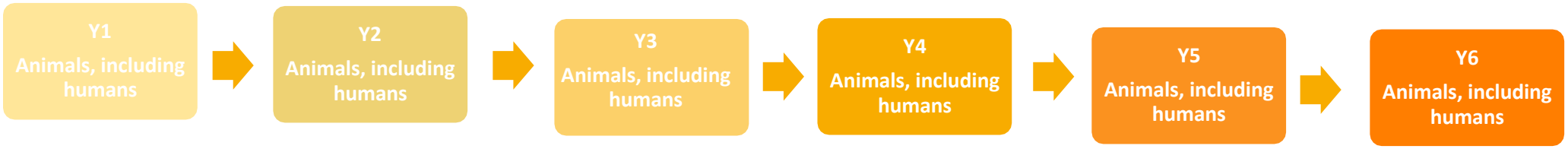
Y4 Sound
❖ identify how sounds are made, associating some of them with something vibrating ❖ recognise that vibrations from sounds travel through a medium to the ear ❖ find patterns between the pitch of a sound and features of the object that produced it ❖ find patterns between the volume of a sound and the strength of the vibrations that produced it ❖ recognise that sounds get fainter as the distance from the sound source increases.

Evolution and Inheritance



Y3 Fossils	Y6 Evolution & Inheritance
❖ describe in simple terms how fossils are formed when things that have lived are trapped within rock	• 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.

Animals Including Humans



Y1 Animals, including humans	Y2 Animals, including humans	Y3 Animals, including humans	Y4 Animals, including humans	Y5 Animals, including humans	Y6 Animals, including humans
❖ identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals ❖ identify and name a variety of common animals that are carnivores, herbivores and omnivores ❖ describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) ❖ identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	❖ notice that animals, including humans, have offspring which grow into adults ❖ find out about 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.	❖ 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 ❖ identify that humans and some other animals have skeletons and muscles for support, protection and movement.	❖ 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 ❖ construct and interpret a variety of food chains, identifying producers, predators and prey.	❖ describe the changes as humans develop to old age.	❖ identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood ❖ recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function ❖ describe the ways in which nutrients and water are transported within animals, including humans.