

# St Anne's Catholic Primary School

## Science Long term Plan



### Key concepts:

Through the science curriculum, pupils will develop an understanding of the following key concepts. These concepts are revisited through different units as pupils move through the school. By the end of primary school, children will know and understand these key concepts.

### Biology

**Organisms require a supply of energy and materials:** Living things are special collections of matter that reproduce, use energy and grow. Food provides materials and energy for life and growth. Plants and bacteria use energy from the sun to generate food. Animals break down food and are ultimately dependant on green plants for energy. In any ecosystem there is competition for the energy and materials needed to live and reproduce.

**Genetic information:** Genetic information is passed down from one generation of organisms to another. Genes determine the development and structure of organisms

**Evolution:** The diversity of organisms is the result of evolution. Different kinds of life, animals, plants and microorganisms, have evolved into different forms best suited to the environments in which they live. Organisms not able to respond sufficiently to changes in their environment become extinct

### Chemistry

All matter (stuff) in the universe is made of tiny building blocks.

**Materials (properties and changes):** The arrangement, movement and types of building blocks of matter, and the forces that hold them together/push them apart, explain all the properties of matter (eg: hot/cold, soft/hard, light/heavy etc...)

**States of matter:** Matter can change if the arrangement of these building blocks change (eg: chemical reactions)

### Physics

The universe follows unbreakable rules that are all about forces, matter and energy

**Forces** are different kinds of pushes and pulls that act on all the matter in the universe. Changing the movement of an object requires a force to be acting on it. Gravity is a universal force of attraction between all objects, however large or small

**Energy:** There are many different forms of energy eg: light, sound, electricity, heat and wind. Energy can be transferred from one object to another and can cause changes. The total amount of energy in the universe is always the same but energy can be transformed when things change or are made to happen

## Earth Science

**The earth in relation to the universe:** The Earth is one of 8 planets orbiting the sun. Our solar system is a very small part of one of millions of galaxies in the universe.

**The earth spins on its axis:** The Earth is tilted and spins on its axis leading to day and night, the seasons and climate

## Scientific Enquiry strategies

As part of **working scientifically** which is embedded throughout all units, pupils will also learn to use a variety of **enquiry strategies** to answer scientific questions. Different questions lead to different types of enquiry and are not limited to fair testing. By the end of primary school, children will be able to use these enquiry strategies confidently and know that different strategies may be needed at different times.

**Observing over time:** (observing or measuring how one variable changes over time)

**Identifying and classifying:** (identifying and naming materials/living things and making observations or carrying out tests to organise them into groups.)

**Looking for patterns:** (making observations or carrying out surveys of variables that cannot be easily controlled and looking for relationships between two sets of data)

**Comparative and fair testing:** (observing or measuring the effect of changing one variable when controlling others)

**Answering questions using secondary sources of evidence:** (answering questions using data or information that they have not collected first hand) As well as this, pupils will learn about:

**Using models:** (Developing or evaluating a model or analogy that represents a scientific idea, phenomenon or process)

## Disciplinary concepts

Through each unit of science, the following second order concepts are explored:

**Responsibility:** (working safely, how science can solve problems, climate change and sustainability)

**Similarity and difference:** (making comparisons, finding patterns, noting differences and drawing conclusions)

**Cause and consequence:** (models and laws, reactions between materials, observing processes)

**Continuity and change:** (observing what changes and what stays the same)

**Significance:** (significant scientists, discoveries, laws, models and theories)

**Written and oral expression:** (Using scientific terminology, evaluation, drawing conclusions, objectivity, explaining processes, describing and explaining patterns, presenting and interpreting data)

**By the end of EYFS, children will:**

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.

**By the end of Key Stage 1, children will:**

Explore animals, humans and changes within environments and begin to develop simple scientific vocabulary linked to this. Children explore the properties and suitability of materials to given uses. Children use different types of scientific enquiry to answer a range of questions. Children are encouraged to ask questions, discuss their findings and present the ideas in a variety of ways. .

**By the end of key stage 2, children will:**

Have a deep understanding of a range of scientific ideas. Children are able to link scientific ideas to the world around them and, through research, understand how scientific ideas are developed over time. Children use secondary sources of information and purposeful, practical enquiry to draw conclusions and find things out.

## Whole School Science Overview

	Term One		Term Two		Term Three	
<b>Nursery</b>  <b>Understanding Our World : The Natural World</b>	<b>My Nursery Where Do I Belong?</b> Use their senses, and talk about what they see, hear etc. Talk about, look at books and use vocabulary linked to body parts.	<b>Marvellous Me! Who Am I?</b> Begin to understand growth through change over time, from birth in relation to themselves. Have an awareness of the seasons-autumn to winter. Observe and talk about changes in weather and nature during this time. Be aware of light and dark comparing and contrasting similarities and differences through the use of stories, photographs, films, Sorting nocturnal and diurnal animals and activities. Observe and draw pictures of animals e.g. Creation story, own pets	<b>Once Upon a Time</b> Explore aspects and changes of the seasons-winter to spring. Recognise and talk about changes in the weather. Sort objects and clothes for different types of weather. Understand, describe and draw features of other environments.	<b>All Creatures Great &amp; Small</b> Investigate ways that we keep ourselves healthy. Learn about how to care for living things and the environment. Plant seeds and observe growing over time. Communicate what is seen and what is happening. Record results. Begin to conduct experiments, such as plants without water. Understand, describe and draw features of other environments.	<b>Ready, Steady, Grow</b> Begin to conduct experiments e.g. forces. Examine animals to observe characteristics and features, including insects, sea life, zoo and farm animals.	<b>On the Move</b> Explore aspects and changes of the seasons-spring to summer. Observe and record seasonal changes Developing understanding of new life, linked to seasons e.g. caterpillars. Show care and concern for, living things. Examine animals to observe characteristics and features, including insects, sea life, zoo and farm animals.
	<b>Weather &amp; Seasons</b> Changes in weather and seasons (Autumn)	<b>Weather &amp; Seasons</b> Changes in weather and seasons (Winter)	<b>Weather &amp; Seasons</b> Changes in weather and seasons (Spring)	<b>Weather &amp; Seasons</b> Changes in weather and seasons (Spring)	<b>Weather &amp; Seasons</b> Changes in weather and seasons (Summer)	

	Term One		Term Two		Term Three	
<b>Reception</b>  <b>Understanding Our World : The Natural World</b>	<b>The Story of My Life</b>  Understand seasonal weather change (autumn/winter) and Observe, discuss and record seasonal changes in environment and the effects on ourselves Identify key features of Observe, describe and draw simple features of plant growth and name the parts of the plants. Describe, discuss and record sequences of the lifecycle of a plant. the setting and the local environment indoors and out.	<b>All About Me!</b>  Discuss, observe and draw simple features of humans, objects and living things. Compare and contrast similarities and differences height, weight, shoe size hair colour etc.-sort by given criteria. Observe and identify external body parts, observing how body parts move. Name the 5 senses and how we use them (explore impairment) Investigate and identify objects using the senses. Begin to understand requirements for healthy living e.g. hygiene and predict what might happen if we do not lead a healthy lifestyle.	<b>My Family &amp; My Community</b>  Identify key features of the setting and the local environment indoors and out Discussing similarities and differences between families in terms of relationships, characteristics, diets, lifestyles.	<b>Amazing Animals!</b>  Examine change that may be reversed e.g. melting ice. Experiment, predict, describe, discuss and communicate their findings using appropriate vocabulary. Use appropriate scientific vocabulary. Talk about, explore and predict changes in everyday materials e.g. waterproof Understand seasonal weather change and its impact (winter/spring) Investigate living things, developing monitoring and observations skills.	<b>How Does Your Garden Grow?</b>  Recognise, name and describe similarities and differences between materials. Begin to classify materials by their function and Investigate materials for their functions. Investigate how we can make the world a better place for ourselves and others after us. Observe, draw, describe, classify simple features and characteristics of animals, insect's birds and underwater creatures. Identify similarities and differences between animals and creatures. Observe, describe and sequence the life cycle of an animal.	<b>Home Sweet Home</b>  Observe and discuss different habitats and why animals live and exist where they do. Explore pond life. Understand and talk about seasonal weather change (spring/summer) Understand and describe features of the natural environment through the seaside, sea, sand and rocks. Understand, explore and describe features of the natural environment and classify seaside materials.
		<b>Weather &amp; Seasons</b> Use key vocabulary to describe the passing of time in relation to the seasons.		<b>Weather &amp; Seasons</b> Use key vocabulary to describe the passing of time in relation to the seasons.	<b>Weather &amp; Seasons</b> Use key vocabulary to describe the passing of time in relation to the seasons.	<b>Weather &amp; Seasons</b> Use key vocabulary to describe the passing of time in relation to the seasons.

	Term One		Term Two		Term Three	
Year 1	<u>Chemistry</u> Everyday Materials	<u>Biology</u> Using Our Senses	<u>Biology</u> Looking at animals	<u>Chemistry</u> Everyday Materials	<u>Biology</u> Plant Detectives	<u>Biology</u> Looking at animals
Year 2	<u>Biology</u> What is a habitat?	<u>Chemistry</u> Materials: Good Choices	<u>Chemistry</u> Materials: Shaping Up	<u>Biology</u> The Apprentice Gardener	<u>Biology</u> Growing Up Taking Care	<u>Biology</u> Taking Care
Year 3	<u>Biology</u> Amazing Bodies	<u>Physics</u> Can you see me?	<u>Physics</u> The Power of Forces	<u>Biology</u> How Does Your Garden Grow		<u>Chemistry</u> Rock Detectives
Year 4	<u>Biology</u> Where Does All the Food Go?	<u>Physics</u> Good Vibrations	<u>Chemistry</u> In a State	<u>Physics</u> Switched On!	<u>Biology</u> Where Does All the Food Go?	<u>Biology</u> Human Impact
					<u>Biology</u> Who Am I?	
Year 5	<u>Physics</u> The Earth and Beyond	<u>Chemistry</u> Get Sorted	<u>Physics</u> Feel the Force	<u>Biology</u> Circle of Life	<u>Biology</u> Reproduction in Plants and Animals	<u>Chemistry</u> Marvellous Mixtures
		<u>Chemistry</u> Everyday Materials		<u>Biology</u> Reproduction in Plants and Animals		
Year 6	<u>Physics</u> Light Up Your World	<u>Biology</u> Everything Changes	<u>Biology</u> Body Pump	<u>Physics</u> Danger Low Voltage	<u>Biology</u> Body Health	<u>Biology</u> Nature Library