St Joseph's Catholic Primary School

St. Alban
Catholic Schools' Partnership

Knowledge and Skills – Subject Overview

Subject: Science Key Stage: 1 (Year 1)		
AREAS	**KNOWLEDGE**	**SKILLS**
Working Scientifically	• To know what a question is and how it is formed. • To know how to gather data through the use of tallies and tables. • To name simple equipment and what it is used for. • To know some simple standard units and their abbreviations e.g. cm. • To know how to use different simple equipment e.g. magnifying glasses and sorting hoops to identify and compare.	• 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.
Plants	• To name a variety of common wild and garden plants, including deciduous and evergreen trees • To name the basic structure of a variety of common flowering plants, including trees.	• Identification of common wild and garden plants, including deciduous evergreen trees. • Identify and describe the basic structure of a variety of common flowering plants, including trees.
Animals including Humans	• Name a variety of common animals including fish, amphibians, reptiles, birds and mammals. • Name a variety of common animals that are carnivores, herbivores and omnivores. • To know the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). • To name the basic parts of the human body.	• Identify a variety of common animals including fish, amphibians, reptiles, birds and mammals. • Identify 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, draw and label the basic parts of the human body and say which part of the body is associated with each sense.

Everyday Materials	• Name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. • To know a variety of everyday materials on the basis of their simple physical properties. • Name a variety of everyday objects.	• Distinguish between an object and the material from which it is made. • Identify a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. • Compare and group together a variety of everyday materials on the basis of their simple physical properties. • Describe the simple physical properties of a variety of everyday materials.
Seasonal Changes	• To name the four seasons and their features	• Observe and describe weather associated with the seasons and how day length varies. • Observe changes across the four seasons.

Subject: Science **Key Stage: 1 (Year 2)**		
AREAS	**KNOWLEDGE**	**SKILLS**
Working Scientifically	• To understand what a scientific question is. • To name a range of simple equipment and what they are used for. • To know some standard units and their abbreviations e.g. cm etc. • To know how to gather data through the use of tallies and tables. • To know how to use different equipment e.g. magnifying glasses and sorting hoops to identify and compare.	• 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.
Topic	**KNOWLEDGE**	**SKILLS**
Plants	• To understand how seeds and bulbs grow into mature plants. • To understand the variables a plant needs to be healthy.	• Observe how seeds and bulbs grow over time and explain their changes. • To describe how plants need water, light and a suitable temperature to grow and stay healthy.
Living Things and Their Habitats	• To understand the differences between things that are living, dead, and things that have never been alive. • To know that most living things live in habitats to	• To be able to explore and compare using sorting hoops the differences between things that are living, dead, and things that have never been alive. • To be able to identify that most living things live in

	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. • To name a variety of plants and animals in their habitats, including microhabitats. • To understand how animals, obtain their food from plants and other animals, using the idea of a simple food chain, and name different sources of food.	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 (food chains). • To identify a variety of plants and animals in their habitats, including microhabitats. • To explain how animals, obtain their food from plants and other animals, using the idea of a simple food chain, and identify sources of food.
Animals including Humans	• Notice that animals, including humans, have offspring which grow into adults. • To know the names of common baby animals. • Find out about 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.	• To identify the things needed for survival by carrying out investigations into what constitutes a healthy and unhealthy lifestyle. • Describe the basic needs of animals, including humans, for survival (water, food and air).
Uses of Everyday Materials	• To understand how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	• To compare and identify the suitability of every day materials and their uses.

Subject: Science **Key Stage: 2 (Year 3)**		
AREAS	**KNOWLEDGE**	**SKILLS**
Working Scientifically	• To understand what a fair test is. • To know the names and uses of a range of equipment and apparatus. • Know basic standard units and abbreviations for measuring e.g. including: millilitres (ml), litres (l), grams (g), kilograms (kg), tonnes (t), millimetres (mm), centimetres (cm), metres (m), kilometres (km), seconds (s), minutes (mins), hours,	• To read and draw a variety of simple scales. • To understand how to interpret data from a graph/table and how to use the data to understand scientific enquiry. • 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

	days/weeks/months/years, degrees Celsius. • To know how to read, gather and present data through tables and bar charts.	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.
Topic	**KNOWLEDGE**	**SKILLS**
Plants	• Identify the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. • To name the parts of a plant *(prior learning Year 1 and 2).* • To understand the requirements needed for a healthy plant to grow. • To understand the function of water for healthy plant growth. • To understand that different parts of a flower have different purposes.	• 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.
Animals including Humans	• To know that animals and humans need the right type and amount of nutrition and that they cannot make their own food, they get nutrition from what they eat. • To know what a carnivore, herbivore and omnivore are. • 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.	
Rocks	• To name different kinds of rocks. • To understand what a fossil is.	• Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. • Describe in simple terms how fossils are formed when things that have lived are trapped within rock. • Recognise that soils are made from rocks and organic matter.
Light	• To understand how light is formed. • To understand the importance of light. • To understand the terminology associated with light e.g. transparent, opaque and reflective. • 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 object.	• 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. • Find patterns in the way that the size of shadows change.
Forces and Magnets	• To know what a force is and how to measure force. • To understand what a magnet is and its properties. • To name different surfaces and their textures.	• To describe the properties of different surfaces. • To know how to read a newton meter scale. • 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.

Subject: Science

Key Stage: 2 (Year 4)		
AREAS	**KNOWLEDGE**	**SKILLS**
Working Scientifically	• To understand what a fair test is, through an understanding of variables. • To understand how to read, gather and present data from a bar chart/table and how to use the data to understand scientific enquiry. • To know the names and uses of a range of equipment and apparatus. • Know basic standard units and abbreviations for measuring e.g. including: millilitres (ml), litres (l), grams (g), kilograms (kg), tonnes (t), millimetres (mm), centimetres (cm), metres (m), kilometres (km), seconds (s), minutes (mins), hours, days/weeks/months/years, degrees Celsius.	• To know how to read different types of scales. • Ask scientific questions. • 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.
Topic	**KNOWLEDGE**	**SKILLS**
Animals Including Humans	• To know what the digestive system is. • To know that human and adult teeth differ. • To know the names of different teeth types. • To understand the different parts of a food chain • To know the definitions of: producer, predator, prey and some common examples of these animals.	• 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.

States of Matter	• To understand materials are categorised into three different types. • To know that some materials can change their appearance when they go through a process. • To know the different parts of the water cycle.	• 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.
Sound	• To understand that sounds can be described as high pitched or low pitched • To know what a sound is. • To understand that sound travels in waves. • To know how to make a loud or quiet 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.
Electricity	• To know how electricity is generated. • To know which appliances are electrical and which are not. • To understand what happens when a circuit is not complete. • To know how to make a circuit. • To know what the symbols in a circuit represent. • 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.	• 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.

Subject: Science Key Stage: 2 (Year 5)		
AREAS	**KNOWLEDGE**	**SKILLS**
Working Scientifically	• To understand which graph is needed to represent different pieces of data. • Name different types of graphs and scientific diagrams. • To understand how to read, gather and present data from bar charts and line graphs. • Know names and uses of an increasing range of equipment and apparatus. • Know basic standard units and abbreviations for measuring e.g. including: millilitres (ml), litres (l), grams (g), kilograms (kg), tonnes (t), millimetres (mm), centimetres (cm), metres (m), kilometres (km), seconds (s), minutes (mins), hours, days/weeks/months/years, degrees Celsius.	• To know how to ask and answer an increasing range of scientific questions. • To know how to read scales on different scientific equipment. • To be able to explain what a science enquiry proves. • Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. • Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. • Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. • Recognise and read results from different graph types. • 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.
Topic	**KNOWLEDGE**	**SKILLS**
Living Things and their Habitats	• To know that animals can be grouped differently according to their features. • Know what constitutes: mammal, amphibian, insect,	• 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

	bird.	plants and animals.
Animals including Humans	• To understand the changes adults and animals go through.	• Describe the changes as humans develop to old age.
Properties and Changes of Materials	• To know different materials can be changed in response to different processes. • To understand the scientific enquiry needed for filtration, evaporation and separation. • To know the main processes of changing state. • To know that some processes are irreversible.	• Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. • 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. • 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.
Earth and Space	• To know the names of all the planets and other key parts of the solar system e.g. asteroid belt, the Sun, the Moon, Pluto. • To understand the solar system in relation to the universe. • To understand how seasons occur.	• 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. • Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.
Forces	• To know what gravity is and how it was discovered. • To know the names of some common forces and where they may be experienced e.g. up thrust in water.	• To describe the effects of a force. • Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. • Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Subject: Science Key Stage: 2 (Year 6)		
AREAS	**KNOWLEDGE**	**SKILLS**
Working Scientifically	• To understand which graph is needed to represent different pieces of data. • Name a range of different types of graphs and scientific diagrams. • To understand how to read, gather and present data from a range of bar charts and line graphs. • Know names and uses of an increasing range of equipment and apparatus. • Know standard units and abbreviations for measuring e.g. including: millilitres (ml), litres (l), grams (g), kilograms (kg), tonnes (t), millimetres (mm), centimetres (cm), metres (m), kilometres (km), seconds (s), minutes (mins), hours, days/weeks/months/years, degrees Celsius.	• To know how to ask and answer an increasing range of scientific questions. • To know how to read scales on different scientific equipment. • To be able to explain what a science enquiry proves. • Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. • Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when 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.
Topic	**KNOWLEDGE**	**SKILLS**
Living Things and their Habitats	• To understand that plants and animals can be grouped accordingly. • To know what a living thing is. • To know the main categories of living things and how they are defined.	• 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.
Animals including Humans	• To know what the circulatory system is. • To understand the implications a poor diet can have on the human body. • Identify and name the main parts of the human circulatory system. • Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.	• Describe the functions of the heart, blood vessels and blood. • Describe the ways in which nutrients and water are transported within animals, including humans.
Evolution and Inheritance	• To name the characteristics of a suitable environment for specific plants and animals. • To understand what evolution is and how it was discovered.	• Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
Light	• Recognise that light appears to travel in straight lines and why.	• 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 eye. • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.