



St. Joseph's Catholic Primary School



Christ at the Centre, Children at the Heart

Science at St. Joseph's

Intent

At St Joseph's, our Science curriculum inspires children to explore the natural world with curiosity and wonder. Pupils develop the knowledge, skills and vocabulary to investigate and understand scientific concepts. They are encouraged to take opportunities to ask questions, carry out experiments, and think critically about the world around them. Through their learning, children understand the impact of science on society and the environment, recognising their role as stewards of God's creation.



- Develop a curiosity and fascination about the natural world and scientific ideas.
- Equip children with the knowledge, skills, and vocabulary to explore, investigate, and understand scientific concepts.
- Develop investigative and practical skills, make predictions, and analyse results, fostering critical thinking and problem-solving.
- Understand the impact of science on society and the environment, recognising their responsibility as stewards of God's creation and the wider world.



Implementation

Our Science curriculum has been designed in partnership with Science specialists within our trust. It ensures clear progression in both acquisition of knowledge and the development of key skills.

Science is taught two hours per week and follows our consistent pedagogy.

Pupils are given a range of practical opportunities to develop and master these. The use of outdoor learning, educational visits and visits from those working in the field are encouraged to enable pupils to gain first-hand experiences to enrich their learning, understanding and cultural capital. Science can be enriched by meaningful links to other subjects within the curriculum, such as reading, writing, recording and interpreting results in mathematics and application of computing skills.

Impact

As a result of our Science curriculum, our pupils:

- Develop strong scientific knowledge and can ask questions, investigate, and reach answers through enquiry.
- Theorise, plan fair tests, and carry out investigations, recording results, identifying patterns, and drawing conclusions.
- Confidently use scientific language and vocabulary to explain topics.
- Are prepared to think, write, and read as scientists, ready for KS3 and beyond.

Sequence of Learning

	Year 1/2	Year 3/4	Year 5/6
Year A	Animals including Humans (Offspring, Lifecycles, Survival, Being Healthy - Unit 2)	Animals including Humans (Digestion, teeth - Unit 4)	Animals including Humans (Heart, diet, drugs - Unit 6)
	Living Things (Living, dead or never alive, Habitats, microhabitats, food chains - Unit 1)	Living Things (MRS GREN, grouping living things, classification keys, environmental changes - Unit 2)	Living Things (Classifying living thing, using a classification key, cells and microorganisms, helpful and unhelpful microorganisms - Unit 4)
	Plants (What's in the garden? Trees, Autumn, Spring - Unit 1)	Earth and Space (Different rocks and their features, the three rock types, the rock cycle and how fossils are formed - Unit 2)	Light and Sound (How does light travel, how can we see, reflection and refraction, investigating shadows and what is a rainbow? - Unit 2)
	Materials (Suitability, natural/man made, changing shape of an object - Unit 2)	Materials (Solids, liquid, gases, changes of state, how does temperature affect the rate of change of state, the water cycle - Unit 3)	Evolution (Species, DNA and genetics, Natural Selection and Adaptive Human Traits- Unit 1)
	Electricity (What is electricity? Being safe around electricity, a simple circuit investigation - Unit 1)	Electricity (What is electricity? Types of circuits, investigating circuits & insulators and conductors - Unit 2)	Electricity (Interpreting and drawing circuit diagrams, investigating changes in voltage, investigating resistant in circuits, static electricity - Unit 3)
Year B	Animals including Humans (Animal kingdoms, what animals eat, the structure of animals and our body and senses - Unit 1)	Animals including Humans (Nutrition and food groups, the Human Body, Types of Skeletons and muscles – Unit 3)	Animals including Humans (Reproduction, puberty etc - Unit 5)
	Earth and Space (Seasons/Weather - Unit 1)	Movement, Forces and Magnets (Forces over distances, Magnets, magnetism, magnetic materials - Unit 2)	Sound (How sounds travel, sound waves, speed of sound, auditory ranges – Unit 2)
	Materials (What is a material, properties, comparing and grouping - Unit 1)	Sound (Good vibrations, how do we hear sounds? Pitch, Investigating sounds over the distance - Unit 1)	Earth and Space (Where are we in our universe? The orbits of the planets, night and day, the moon & the role of space travel - Unit 3)
	Movement, Forces and Magnets (Push, pull, float, sink - Unit 2)	Plants (Parts of a flowers, What Plants Need to live, Pollination, Seed dispersal - Unit 3)	Living Things (Sexual and asexual reproduction, life cycles, metamorphosis, reproduction, flowers - Unit 3)
	Plants (Where do plants come from? Life cycle of a plant, what plants need to live and plants in different climates - Unit 2)	Light and Seeing (What is light? Reflections, shadows, sun safety - Unit 1)	Movement, Forces and Magnets (Gravity, Resistance, Friction, Gears, pulleys and leavers - Unit 3)
			Materials (Suitability, reversible/irreversible change, mixing and dissolving, separating mixtures and solutions - Unit 4)

Working Scientifically

Working scientifically is the process through which pupils learn to think and act like scientists. It involves developing the skills needed to ask questions, plan investigations, collect and analyse data, and draw conclusions based on evidence. These skills progress throughout primary education:

Early Years

Children begin their scientific journey through play and exploration. They observe the world around them, notice changes, and ask questions such as “What happens if...?” They use their senses to explore materials, living things, and seasonal changes. Recording is often through talk, drawings, or simple collections. Curiosity and wonder are nurtured through hands-on experiences.

Key Stage One

Pupils build on this curiosity by asking simple scientific questions and making observations. They learn to perform basic tests, identify and classify objects, and describe what they notice. Recording moves from drawings to simple charts and tables. They begin to use everyday language to explain findings.

Lower Key Stage Two

Pupils start planning fair tests, recognising variables and controlling them where possible. They use equipment accurately, take measurements, and record data in tables and bar charts. They begin to use scientific vocabulary to explain what they have found and start to make predictions based on prior knowledge.

Upper Key Stage Two

Pupils refine their ability to plan investigations independently, predict outcomes, and justify their methods. They analyse results, identify patterns, and draw conclusions supported by evidence. They use a range of data presentation methods, including graphs, and evaluate the reliability of their findings. They apply their knowledge to real-world contexts and communicate findings clearly.

Across All Stages:

Pupils learn to work collaboratively, communicate findings clearly, and apply their knowledge to real-world contexts. They develop curiosity, resilience, and critical thinking, preparing them to approach science with confidence in KS3 and beyond.



Careers Within Science



At St Joseph's, we believe science is the key to unlocking a world of possibilities. A part of our mission is to prepare our children to achieve well and inspire them to dream big. We want our pupils to understand the purpose of their learning and make links between the skills and knowledge they learn during lessons and how it will help them in the world of work.

Every unit of work is designed not only to build knowledge but to spark ambition, with a dedicated career focus and an explicit lesson that connects learning to real-life roles in science, technology, engineering, and mathematics.

Our pupils discover how science shapes the world and explore the exciting careers that make it happen. Through Science-focused sessions during Careers Week and vibrant STEM Days throughout the year, we celebrate innovation and inspire curiosity.

These experiences empower our children to see themselves as future scientists, engineers, and problem-solvers, ready to make a difference in a rapidly changing world.

We use the following resources to aid discussion:

Animals Including Humans	Prosthetist-orthotist - https://www.bbc.co.uk/bitesize/articles/zk3b2sg Dental Therapist - https://www.bbc.co.uk/bitesize/articles/zgg9ty Cardiac coach - https://www.bbc.co.uk/bitesize/articles/zt43r2p Birds of Prey Specialist - https://www.bbc.co.uk/bitesize/articles/zvnmngxw Dietician - https://www.bbc.co.uk/bitesize/articles/zth26g8 Occupational Therapist - https://www.bbc.co.uk/bitesize/articles/zd8dnrd Sonographer - https://www.bbc.co.uk/bitesize/articles/zrd48hv Radiographer - https://www.bbc.co.uk/bitesize/articles/z3v62v4 Physiotherapist - https://www.bbc.co.uk/bitesize/articles/zr3b7nb Midwife - https://www.bbc.co.uk/bitesize/articles/z7jckty
Living Things and their Habitats	Marine Conservationist - https://www.bbc.co.uk/bitesize/articles/z6qvkv7 Ornithologist - https://www.bbc.co.uk/bitesize/articles/zkcxyc Vet - https://www.bbc.co.uk/bitesize/articles/znmvwtv Veterinary Nurse - https://www.bbc.co.uk/bitesize/articles/znpknrd Beekeeper - https://www.bbc.co.uk/bitesize/articles/z7fjihv Ecology - https://www.youtube.com/watch?v=iqMNYbGGUmM Zookeeper - https://www.bbc.co.uk/bitesize/articles/z672382
Earth and Space	Aerospace engineer - https://www.bbc.co.uk/bitesize/articles/zni9scw Pilot - https://www.bbc.co.uk/bitesize/articles/zv3vcxs Volcano vlogger - https://www.bbc.co.uk/bitesize/articles/zrc7y9q
Plants	Florist - https://www.bbc.co.uk/bitesize/articles/zk27382 Gardener - https://www.bbc.co.uk/bitesize/articles/zrd7bdm Ecologist - https://www.bbc.co.uk/bitesize/articles/zdnw382 Photosynthesis - https://www.youtube.com/watch?v=UofM-EyH8XE&list=PLVEWa7uIDT75raD2vVyzBkyJA2w6tS1b&index=17
Light and Seeing	Light Technician - https://www.bbc.co.uk/bitesize/articles/z4wfwty
Sound	Audiologist - https://www.bbc.co.uk/bitesize/articles/zki2rj6
Electricity	Solar Farm Manager - https://www.bbc.co.uk/bitesize/articles/z6giscw Electrician - https://www.bbc.co.uk/bitesize/articles/zrpdf4j
Evolution and Inheritance	https://www.youtube.com/watch?v=74VRcpeU7Bk Forensic Scientist - https://www.bbc.co.uk/bitesize/articles/z4ysb7h
Material	Formula One Engineer - https://www.bbc.co.uk/bitesize/articles/zvk3jhw Engineer - https://www.bbc.co.uk/bitesize/articles/zpgdkty



Progression of Skills and Knowledge



	Year 1/2	Year 3/4	Year 5/6
	Biology		
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 animal, 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. - Describe the key stages in the growth and development of humans. - Recall some of the changes experienced in puberty. - Investigate the gestation periods of other animals in comparison to humans including the length and mass. - 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.
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 (recognise that flowering plants have roots, stems, leaves, and flowers and recognise that trees have roots, a trunk, branches, and leaves). - 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	

Living Things and their Habitats	- Identify the differences between things that are living, dead, and things that have never been alive, using some of the 7 life processes (movement, respiration, sensitivity, growth, reproduction, excretion, nutrition). - Identify most living things and their habitats to which they are suited - Describe how different habitat 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 a simple food chain, and identify and name different sources of food.	- Know the 7 life processes of living organisms. - Use the 7 life processes to determine if an organism is living. - Describe similarities and differences between examples of plants and animals. - Know the features of mammals, amphibians, fish, birds, reptiles (vertebrates) and invertebrates. - Group living things in a variety of ways using key characteristics. - Use classification keys to help group and identify a variety of living things in their local and wider environment. - Recognise that environments can change, and this can sometimes pose dangers to living things. - Understand that human actions can impact on the environment and suggest some solutions to the issues.	- Describe the differences in the life cycles of a mammal, amphibian, insect and a bird. - Describe the life process of reproduction in some plants and animals - Use prior knowledge of parts of a flower to explain the stages involved in the reproduction process (pollination, fertilisation and germination). - Explain that sexual reproduction requires both male and female DNA (sex cells) and will produce offspring that are similar, but not identical to the parents. - Explain that asexual reproduction will produce offspring that is identical to the parent and only requires on parent e.g., bulbs, tubers and runners. - Explain the process of metamorphosis using frogs and butterflies as examples. - Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals - Give reasons for classifying plants and animals based on specific characteristics
Evolution and Inheritance	n/a	n/a	- 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



Progression of Skills and Knowledge



Physics			
Earth and Space	- Name the 4 seasons and say when in the year they occur. Observe changes across the 4 seasons. Observe and describe weather associated with the seasons. - Can describe other features that change throughout the year that are caused by the change in weather e.g. numbers of mini beasts found outside, seed and plant growth, leaves on trees, clothes worn by people, hibernation and migration. - Explain how day light (from the sun rising to sun setting) length varies across the year (longer in summer, shorter in winter).	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	Describe the movement of the Earth around the sun in the solar system (a full orbit is 365 days, the Earth spins on its axis every 24 hours). Describe the movement of the moon relative to the Earth (lunar cycles take 28 days, the lunar cycle and eclipses). 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 - Name the planets of Our Solar System and understand Our place in Our universe - Describe what meteors are, and name other objects in space.
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
Magnets and Forces	- Observe and describe different ways of moving - Identify similarities and differences between movement of different objects - Make suggestions about how objects can be made to move - Explore contact forces (push and pull) - Explore how objects sink or float - Know that it is not only ourselves that make things move and ask questions about what is causing movement	Compare how things move on different surfaces Notice that some forces need contact between 2 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 2 poles Predict whether 2 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
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 the light from a light source is blocked by an opaque object 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

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	
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Progression of Skills and Knowledge



Chemistry			
Everyday Materials	• Correctly identify and name 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 (see vocabulary appendix for examples) of a variety of everyday materials. • Compare and group a variety of everyday materials based on 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 uses. • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	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 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

