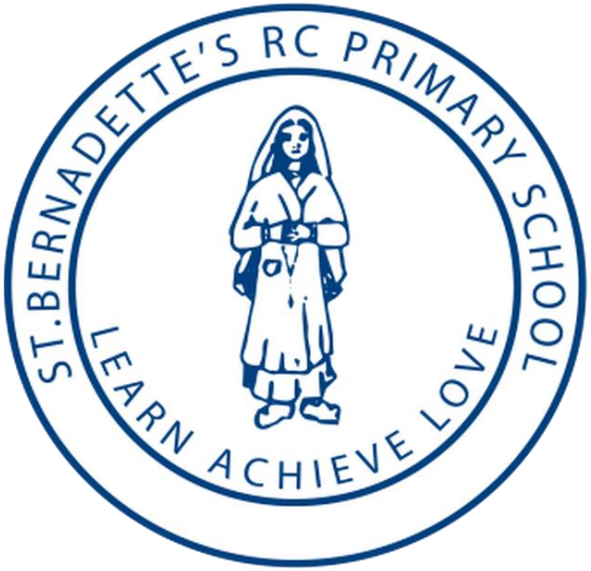
ST BERNADETTE'S RC PRIMARY SCHOOL



SCIENCE CURRICULUM

St Bernadette's RC Primary School

Science Curriculum

Science Curriculum Intent

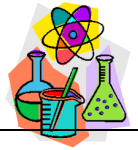
Our curriculum has been developed to ensure a full coverage of the National Curriculum and to foster a sense of wonder about God's natural world. At St Bernadette's we recognise the importance of Science in every aspect of daily life and believe that the teaching and learning of Science should excite and stimulate children's natural curiosity to enable them to make sense of the world in which they live. To further enhance our Science teaching and learning we have embarked upon the PSQM Award (Primary Science Quality Mark) in Spring 2022 with the aim of:

- ✓ Enhancing science subject leadership
- ✓ Enhancing the teaching and learning of Science from Foundation Stage to Year 6
- ✓ Identifying wider opportunities for the teaching of Science in the wider world

Our Science curriculum is now linked, where possible, to our topic "themes" to provide a creative scheme of work, which reflects a balanced programme of study. It is designed to ensure pupils:

- ✓ Build upon prior learning
- ✓ Make rich connections in knowledge which is underpinned by scientific vocabulary
- ✓ Develop scientific knowledge and conceptual understanding through the specific disciplines of Biology, Chemistry and Physics.
- ✓ Develop the essential scientific enquiry skills to deepen their scientific knowledge.
- ✓ Use a range of methods to communicate their scientific information
- ✓ Develop an enthusiasm and enjoyment of scientific learning and discovery.

Working scientifically, through the five lines of enquiry, is taught alongside subject learning.



St Bernadette's RC Primary School

Science Curriculum

Working as Scientists in EYFS

Geo taught a wide range of essential enquiry skills. These skills should build upon earlier opportunities they have had to play, explore, create, engage in active learning, and think critically in the Early Years Foundation Stage.

Science enquiry in the EYFS will build upon:

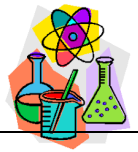
- ✓ Ask simple "Why" and "How" questions.
- ✓ Offer explanations for why things might happen, making use of recently introduced vocabulary.
- ✓ Observe and talk about similarities and differences.
- ✓ Describe what they see, hear and feel.
- ✓ Take part in simple tests with and without adult support.
- ✓ Use equipment

EYFS

The world: 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.

NURSERY

Autumn 1 - Who are my family?	Autumn 2 – Why do the leaves fall off the trees in Autumn?	Spring 1 - What would you pack for a hot/cold holiday?	Spring 2 – How can we stop Incy falling down the spout?	Summer 1 – How does a caterpillar turn into a butterfly?	Summer 2 - How can we take care of our outdoor area?
Animals & Humans: - Identify the different parts of the body and finding out what they do – My hands can… My feet can… - Making healthy choices: Hand Washing/Tooth brushing/food & drink choices (snacks)	Materials: - Changing Materials: Fireworks/Playdough - Volcanoes - mentos Seasonal Change: - Autumn walk - Keeping dry - Bird watch at home & school - Hibernation - What gives us light?	Materials: - Materials and properties linked to weather Seasonal Change: - Winter - Keeping warm - Ice - Water-proofing	Forces: - Magnetic/Non-magnetic - Opposites (up & down) - Floating & Sinking Plants: - Plant seeds & care for growing plants The Lifecycle of a plant – sunflowers & cress	Animals & Humans: - Healthy choices – exercise - Life cycle of a butterfly - Bug Hunt Seasonal Change: - Shadows	Living Things - Caring for our outdoor environment - Recycling - Looking after animals - Litter pick - Importance of water Seasonal Change: - Summer - Keeping cool



St Bernadette's RC Primary School

Science Curriculum

Working as Scientists in EYFS

In order for Key Stage 1 and 2 children to operate as successful scientists, they should be taught a wide range of essential enquiry skills. These skills should build upon earlier opportunities they have had to play, explore, create, engage in active learning, and think critically in the Early Years Foundation Stage.

Science enquiry in the EYFS will build upon:

- ✓ Ask simple "Why" and "How" questions.
- ✓ Offer explanations for why things might happen, making use of recently introduced vocabulary.
- ✓ Observe and talk about similarities and differences.
- ✓ Describe what they see, hear and feel.
- ✓ Take part in simple tests with and without adult support.

Use equipment

EYFS

The world: 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.

RECEPTION

Autumn 1 – Are we all the same?	Autumn 2 - Where Does the Sun Go at Night?	Spring 1 - Are Penguins & Polar Bears Friends?	Spring 2 – What is the best material to build a house from?	Summer 1 - Why are Humans Not Like Frogs?	Summer 2 - How Can We Take Care of Our Wonderful World?
Animals & Humans: - Looking at similarities/differences - Inheritance – The Smeds & the Smoos - Germs & hand washing – Bread investigation; glitter investigation	Seasonal Change: Autumn - Observe the seasonal changes in the school grounds – Similarities and differences - Tree identification - Plant daffodil & tulip bulbs The World: - Know that the sun does not disappear at night & that the earth travels around the sun - Space – Mae Jemison Animals & Humans: - Animals - nocturnal animals; animals that hibernate/migrate & reasons why	Living Things: - Life cycle of a penguin - Habitats – Emperor penguin Plants: - Plant seeds & care for growing plants. - Life cycle of a plant. Animals & Humans: - Match adults to their young. - Life cycle of a penguin Seasonal Changes: Winter - Similarities and differences - Keeping warm & dry (insulation/waterproofing) Materials: - Melting/freezing - Waterproofing	Materials: - Investigate the qualities/properties of different materials (waterproof/non-waterproof) - Houses for the Three Little Pigs - What does a plant need? - Growing a bean seed Seasonal Changes: Spring - Similarities and differences - Grow potatoes, grass	Living Things: - Care for the environment – Animals & Humans: - Life cycle of a frog - Habitats - frog - Sort and group animals in different ways, e.g. number of legs, colour, furry, scaly etc. Seasonal Changes: - Summer- Similarities and differences - Keeping Safe in the sun	Materials: - Recognise, compare and group together some everyday objects made from wood, plastic and glass. - Recycling in local environment & wider world – Michael Recycle - Keeping cool – shelter/shade – which materials? - Magnetism Living Things: - Do all flowers have the same number of petals?

St Bernadette's RC Primary School
Science Curriculum

KEY STAGE 1

Working as Scientists in Key Stage 1

- ✓ Ask simple questions and recognising that they can be answered in different ways.
- ✓ Observe 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.

KEY STAGE 1 YEAR A

Autumn 1 – What's Wrong Mr Bear?	Autumn 2 – What makes Toys Terrific?	Spring 1 – Would You See a Cactus in a Rainforest?	Spring 2 – What's growing in the Royal Garden?	Summer 1 – Why Are Scarecrows Not Alive?	Summer 2 – Do All Sea Creatures Have Gills?
Animals & Humans: - 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. Materials: - Distinguish between an object & it's material - Describe the simple physical properties of everyday materials - find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. Living Things & Habitats: - 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	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, paper and cardboard for particular uses - find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	Animals & 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 Living Things & Habitats: - 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	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 – Water investigation	Animals & 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	Living Things & Habitats: - 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 – OCEAN HABITATS & ANIMALS - 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 Floating & Sinking – linked to WS

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- ✓ Ask simple questions and recognising that they can be answered in different ways.
- ✓ Observe 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.

KEY STAGE 1 YEAR B

SEASONAL CHANGE STUDIED ACROSS THE SEASONS

Autumn 1 – Do All Trees Stay the Same?	Autumn 2 – Why Have All the Animals Disappeared?	Spring 1 – Would You See a Shark in a Desert?	Spring 2 – Which Plants Would Kipper find in the park?	Summer 1 – Do All Babies Hatch?	Summer 2 – The Seaside – Why Should We Only Leave Footprints at the Beach?
Plants: - identify and name a variety of common wild and garden plants, including deciduous and evergreen trees – Tree Hunt - observe and describe how seeds and bulbs grow into mature plants – bulbs?? Materials: - find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	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 – Winter preparation Animals & Humans: - find out about and describe the basic needs of animals, including humans, for survival (water, food and air) – Hibernation Plants: - identify and name a variety of common wild and garden plants, including deciduous and evergreen trees	Animals & 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 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 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.	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	Animals & Humans: - identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals - notice that animals, including humans, have offspring which grow into adults – April – Kipper - Life Cycle of a chick May – Kipper - offspring - describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	Living Things: - explore and compare the differences between things that are living, dead, and things that have never been alive - identify and name a variety of plants and animals in their habitats, including microhabitats Plants: - identify and name a variety of common wild and garden plants, including deciduous and evergreen trees

St Bernadette's RC Primary School

Science Curriculum

LOWER KEY STAGE 2

Working as Scientists in Lower Key Stage 2

- ✓ 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.
- ✓ Using straightforward scientific evidence to answer questions or to support their findings.

LOWER KEY STAGE 2 YEAR A

Autumn 1 - What is the best surface to construct a racing track?	Autumn 2 – Why are insulators as important as conductors?	Spring 1 - Do people with longer legs jump further?	Spring 2 - Do all materials change state when heated or cooled?	Summer 1 - How is a cactus different to an apple tree?	Summer 2 - How can we group the animals we find in our locality?
Forces: - Compare how things move on different surfaces (friction) - Notice how some forces need contact & others do not (magnetic forces)	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.	Animals & Humans: - 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	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.	Plants: - 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	Living Things & 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

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- ✓ 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.
- ✓ Using straightforward scientific evidence to answer questions or to support their findings.

LOWER KEY STAGE 2 YEAR B

Autumn 1 – How is magnetism used in everyday life?	Autumn 2 – What is the best material for making earmuffs for sleeping?	Spring 1 – What happens to the food we eat?	Spring 2 – How do today's building materials compare to those used in Ancient Egypt?	Summer 1 – Are microplastics good for the planet?	Summer 2 – Is it possible to see in the dark?
Magnetism: - 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.	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.	Animals & Humans: - 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	Rocks: - 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.	Plants: - Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal Living Things & Habitats: - recognise that environments can change and that this can sometimes pose dangers to living things.	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 a solid object - find patterns in the way that the size of shadows change.

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Science Curriculum

UPPER KEY STAGE 2

Working as Scientists in Upper Key Stage 2

- ✓ 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.

UPPER KEY STAGE 2 YEAR A

Autumn 1 – Can You Feel the Force?	Autumn 2 – How Could You be the Next Edmund Hillary?	Spring 1 – What Are Things Made From & Why?	Spring 2 – Do All Living Things Have Senses?	Summer 1 – Why do Shadows Exist?	Summer 2 – How Have Living Things Changed Over Time?
Forces: - 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.	Animals Including 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 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	Properties & Changes of Materials: - Compare and group everyday materials on their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal) & response to magnets - Know that some materials will dissolve in liquid to form a solution, & 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	Living Things & 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: - 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	Evolution & 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

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- ✓ 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.

UPPER KEY STAGE 2 YEAR B

Autumn 1 – Could We Survive Without Electricity for 1 Day??	Autumn 2 – Could A Cow Live in The Brazilian Rainforest?	Spring 1 – Why Does nobody live on the Moon?	Spring 2 –Do All Plants & Animals Start Life As An Egg?	Summer 1 – How Different Will You Be When You Are as Old as Your Grandparents?	Summer 2 – Are All Changes Irreversible?
Electricity: - 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. -	Evolution & Inheritance: - identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution	Earth & 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	Living Things & 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.	Animals Including Humans: - Describe the changes as humans develop to old age.	Properties & Changes of Materials: - 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.