Science at St Mary's C of E Primary School

Science Intent

At St Mary's C of E Primary School, we believe that a high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Science in our school is about developing children's ideas and ways of working that enable them to make sense of the world in which they live through investigation, as well as using and applying process skills. The staff at St Mary's C of E Primary School ensure that all children are exposed to high quality teaching and learning experiences, which allow children to explore their outdoor environment and locality, thus developing their scientific enquiry and investigative skills. They are immersed in scientific vocabulary, which aids children's knowledge and understanding not only of the topic they are studying, but of the world around them. We intend to provide all children regardless of ethnic origin, gender, class, aptitude or disability, with a broad and balanced science curriculum.

Implementation

In ensuring high standards of teaching and learning in science, we implement a curriculum that is progressive throughout the whole school.
Planning for science is a process in which all teachers are involved to ensure that the school gives full coverage of, 'The National Curriculum programmes of study for Science 2014' and, 'Understanding of the World' in the Early Years Foundation Stage. Science teaching at St Mary's C of E Primary School involves adapting and extending the curriculum to match all pupils' needs. Where possible, Science is linked to class topics. Science is taught as discrete units and lessons where needed to ensure coverage. Due to a PAN of 45 and mixed year group classes, Science units are taught on a two year rolling programme.

This ensures progression between year groups and guarantees topics are covered. Teachers plan to suit their children's interests, current events, their own teaching style, the use of any support staff and the resources available.

We ensure that all children are provided with rich learning experiences that aim to:

- Prepare our children for life in an increasingly scientific and technological world today and in the future.
- Help our children acquire a growing understanding of the nature, processes and methods of scientific ideas.
- Help develop and extend our children's scientific concept of their world.
- Build on our children's natural curiosity and developing a scientific approach to problems.
- Encouraging open-mindedness, self-assessment, perseverance and developing the skills of 3 investigation – including: observing, measuring, predicting, hypothesising, experimenting, communicating, interpreting, explaining and evaluating.
- Develop the use of scientific language, recording and techniques.
- Develop the use of computing in investigating and recording.
- Make links between science and other subjects.

At St Mary's C of E Primary School, we aspire to promote children's independence and for all children to take responsibility in their own learning, we encourage the children to self-assess their learning during lessons, this is done through the use of targeted open-ended questions. Teachers promote the use of challenging scientific vocabulary and encourage the children to make use of this in their oral and written work. This focus enables the children to articulate scientific concepts clearly and precisely, assisting them in making their thinking clear, both to themselves and others.

Impact

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.

All children will have:

- A wider variety of skills linked to both scientific knowledge and understanding, and scientific enquiry/ in-investigative skills.
- A richer vocabulary which will enable to articulate their understanding of taught concepts.
- High aspirations, which will see them through to further study, work and a successful adult life.

Whole School Science Overview

Year & Cycle	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	Additional Coverage
YEAR F	The Senses Exploration of natural materials. Exploring fruit and vegetables. My body	Signs of Autumn. Changing seasons Hibernation and migration. Winter-Keeping warm in cold weather.	Winter-Keeping warm in cold weather: animals and humans. Explore how eggs, bread and Ice can change in different situations.	Life cycle of plants Parts of a plant What do plants need to survive? Set up experiment using runner beans in different conditions Name some plants Planting the school garden- plants for consumption / pleasure. Look at different types of root vegetable (Based on Enormous Turnip)	Signs of summer	Mini-beasts & their life cycles. Names of different minibeasts and mega beasts/ dinosaurs What do minibeasts and mega beasts need to survive?	Ongoing coverage of these topics throughout the year Opportunities for experiments that inspire awe and wonder to stimulate thinking and curiosity. British Science week: March

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Year 1/2 A	My body Identify and label body parts. Uses of different parts for different activities. The 5 senses	Growth and survival Health, growing up and offspring. Needs of humans Changes as we grow Effects of environment on survival. Balanced diets/ staying healthy	Seasonal changes Observe Features of each season Day length changes How animals and humans are affected by the seasons. Investigate weather in each season	Living in habitats Things that are alive and dead Habitat suitability Food chains	Super scientists Isaac Newton Effects of gravity on objects. Travelling of light through transparent objects. Graham Alexander Bell Can sound travel through objects. Investigating senses and reflexes (linked with historical discoveries). Experiments to test reflexes and senses.	Super scientists How scientists how found out about germs and diseases. How are germs transferred by touching? Thomas Edison Investigate electrical circuits to make a light bulb light up.	Seasonal change is covered throughout the year, to observe ongoing changes in the natural world British Science week: March Links with PE: exercise and the effects on the body
YEAR 1/2 B	Everyday Materials Sorting and classifying materials What makes a material suitable for its use? Exploring how materials can change their shape. Different materials being used for the same product.	Exploring materials and change Material inventions and discoveries. Reversible and irreversible changes	Identifying animals Identifying common animals. Identifying UK mammals. Identify and compare common UK birds, reptiles, fish and amphibians. Identifying and sorting herbivores, carnivores and omnivores. Understanding how to care for and look after animals.	Seasonal changes Observing seasonal change what happens at different seasons hibernation. How animals are affected by the seasons. How humans are affected by the seasons. Weather and length of day linked with the seasons.	Identifying plants Name and label common plants. Sorting and classifying plants. Identify and describe wild plants. Identify and describe trees. Identify parts of a plant. Observing growing plants.	Growing Plants Observe plant growth Needs of plants Different seeds grow into different plants. Plants can grow from bulbs. How and why seeds are dispersed. Investigating conditions that affect germination. How plants can as they mature.	Seasonal change is covered throughout the year, to observe ongoing changes in the natural world British Science week: March Links with PE: exercise and the effects on the body: measuring and comparing fitness levels

Year & Cycle	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	Additional Coverage
YEAR 3/4 A	Rocks, Fossils and soils Types of rocks/ grouping Investigating different rock types Investigate properties What is soil? Fossil formation	Forces and magnets What is a force? Different types of forces Friction Magnets, their properties and reactions to materials	Changing sound Sound and vibrations How sounds are made and reach our ears? Pitch and volume Distance and sound	Light and shadow How we see? Night and day Light sources and reflections The sun Opaque objects and shadows How light travels. Shadow change	How plants grow Functions of plants/ parts of a plant Seeds: Pollination, seed formation seed dispersal Different types of seeds. Needs of types of plants Life cycle	Continuation of Summer 1	British Science week: March Links with PE: exercise and the effects on the body: measuring and comparing fitness levels
YEAR 3/4 B	Health and movement Food groups/healthy eating Diet of humans and animals Skeleton and muscles	Circuits and conductors Uses of electricity Dangers of electricity Making circuits Switches Conductors and insulators	Eating and digestion Classifying: carnivore, omnivore and herbivore Construct and interpret food chains Functions of the digestive system Types of teeth Ways to keep teeth healthy	States of matter Compare and group materials Solids, liquids and gases and their properties. Materials and changes (hot/cold) Temperatures and effects on changes of states of matter. Evaporation/ condensation	Living environments Habitats, why organisms live in different habitats. Grouping organisms according to characteristics. Classifying animals/ classification keys Identifying British plants Human impact on environments	Continuation of Summer 1	British Science week: March Links with PE: exercise and the effects on the body: measuring and comparing fitness levels

Year & Cycle	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	Additional Coverage
YEAR 5/6 A	Earth and space Movement of the Earth, Moon and the planets Seasons Solar system Rotation of Earth (Day and night)	Classifying organisms Grouping organisms according to characteristics. Classification (Carl Linnaeus model) Classification of plants, animals and microorganisms Identifying and classifying organisms in the local area.	Forces in action Gravity/Friction Air/water resistance Levers and Pulleys. Types of forces Gears	Life cycles Sexual reproduction in flowering plants Asexual reproduction Sexual reproduction in animals Life cycles of animals in local environment. Compare how animals and plants reproduce and grow Naturalists	Changes and reproduction Stages of growth and development Compare gestation periods in humans and other animals. Child development and needs of children at different stages. Changes and puberty in both girls and boys Changes in adulthood through to old	Changes and reproduction Stages of growth and development Compare gestation periods in humans and other animals. Child development and needs of children at different stages. Changes and puberty in both girls and boys Changes in adulthood through to old	British Science week: March PE: measuring heart rate, effects of exercise, naming muscles
YEAR 5/6 B	Healthy Bodies Scientific ideas about health and diet. Food groups and nutrition Skeleton and muscles Human circulatory system Effects of alcohol, tobacco and drugs.	Seeing light Shadows: how they are formed and can be changed. The eye Reflection and refraction Colours in white light	Properties and changes of materials Dissolving in liquids to form a solution Use knowledge or solids, liquids and gases to decide how mixtures and solutions can be separated Reversible and irreversible changes Materials and heat Compare and group materials by their properties	Changing circuits Electricity and static electricity Circuits and using symbols in circuits Investigate the lightness of a bulb or speed of a motor.	Evolution and inheritance Fossils Genetic inheritance and differences Environmental adaption (plants and animals) Darwin: Evolution and Inheritance. Evolutions of animals and plants	Evolution and inheritance Fossils Genetic inheritance and differences Environmental adaption (plants and animals) Darwin: Evolution and Inheritance. Evolutions of animals and plants	British science week: March PE: measuring heart rate, effects of exercise, naming muscles