

SCIENCE AT INGOLDISTHORPE C of E VA PRIMARY SCHOOL



Implementation

At Ingoldisthorpe C.E. Primary School, we are committed to providing a rich and engaging science curriculum that aligns with the National Curriculum. Our dedicated approach to science education is designed to foster curiosity, critical thinking, and a love for exploration among our children.

Curriculum Structure: Science holds a prominent place in our 2 year rolling programme which ensures coverage and the ability to build upon previous experiences. We place great emphasis to using the outdoors and the local area to support the teaching of Science. We regularly use the school grounds, Mount Amelia and the River Ingol Wetlands to support our learning.

Teacher-Led Positive Atmosphere: Teachers at our school cultivate a positive attitude toward science within their classrooms and utilise outdoor spaces when suitable to enhance the learning experience. We firmly believe that every child is capable of achieving high standards in science, and our teachers work to reinforce this expectation.

Holistic Teaching Approach: Science is taught in carefully planned and arranged topic blocks by class teachers, allowing for in-depth exploration and understanding. Problem-solving opportunities are woven into our planning, encouraging children to ask questions and use their scientific skills for independent discovery. Curiosity is celebrated, creating an environment that stimulates a love for learning.

Building on Previous Learning: Our curriculum is designed to build upon the learning and skill development of previous years. As students begin progress, they gain confidence in selecting, using scientific equipment, and interpreting results. We celebrate their growing ability to draw conclusions based on real evidence.

Working Scientifically Skills: Working Scientifically skills are integrated into lessons, ensuring a continuous development throughout a child's school career. New vocabulary and challenging concepts are introduced through direct teaching, fostering a deep understanding of scientific principles.

Practical Application and Outdoor Learning: Teachers at Ingoldisthorpe C.E. Primary School demonstrate the use of scientific equipment and 'Working Scientifically' skills to embed understanding. We actively seek opportunities for outdoor learning, to support the teaching of Science. Science lessons are complemented by enriching experiences, including Science Week, STEM activities, and engaging visits from the local high school and visitors such as the LINCS Planetarium. Children are also given the opportunity to explore Science further in our weekly after school science club.

In conclusion, we are dedicated to creating a dynamic and inspiring science curriculum that not only meets national standards but goes beyond, instilling a passion for scientific inquiry in every student. Through engaging lessons, a positive atmosphere, and practical application, we aim to encourage a generation of inquisitive minds ready to embrace the challenges of the future.

Intent

At Ingoldisthorpe C of E Primary School, Science primarily takes a very hands-on approach. In line with our school vision statement, children work in a challenging learning environment and are encouraged to use their independence, to be inquisitive, ask questions, be creative, develop independent thinking and discuss their learning. Science lessons reflect the vision and ethos of the school and are designed to engage, inspire, promote independence and build upon previous skills and knowledge. 'Working scientifically', which involves the understanding of the sorts of questions that are key to science, is carefully considered and planned with care and thought into lessons. The creative approach of our curriculum ensures that the design of experiments, reasoning and arguing with scientific evidence, as well as analysing and interpreting data, is intertwined throughout and clearly related to the appropriate objectives. Ultimately, we aspire to ensure that our children become confident and successful learners, enjoying the process of exploring values and ideas through science.

Our curriculum overview

Science	<p>Weather and seasonal changes Freezing, melting Materials</p>	<p>Key knowledge: -liquids can be frozen to solid/ melt -solids and liquids -understanding of temperature</p> <p>Key skills: -knowing different types of weather -measurement of temperature</p> <p>SEN/G&T: -visual resources/ matching -use and read a simple thermometer</p>	<p>Everyday materials -identifying uses for wood, plastic, glass and metal. -Physical properties of materials, adding heat solids/liquids Electricity</p>	<p>Key knowledge: -uses of everyday materials -identify and compare materials -describe simple properties -How to create an electrical circuit</p> <p>Key skills: -fair testing/experimenting -recording data -comparing properties -classifying and identifying -evaluating and make predictions</p> <p>SEN/G&T: -visual resources/adult support -key vocabulary/ paired work/ -use of thermometer, recording testing, extended vocabulary</p>	<p>Rocks, soils and fossils States of matter</p>	<p>Key knowledge: -igneous, metamorphic and sedimentary rocks and soils -Soil composition, soil types and its uses, Earth composition/ how fossils are formed, the water cycle -solids, liquids, gases</p> <p>Key skills: -fair testing, changing a variable -recording experiment -classifying rocks/materials -reflecting on predictions and data collected in conclusions</p> <p>SEN/G&T: -picture differentiation -key vocabulary/ paired work -extended vocabulary, classifying, sorting, and experimenting -other ways of recording</p>	<p>Human and animal lifecycles Forces</p>	<p>Key knowledge: -how humans and animals change over time, lifecycles and classification -to understand micro-organisms -to understand gravity, air/ wind resist</p> <p>Key skills: -to investigate a hypothesis fairly -to measure results and evaluate them -to record accurately and modify tests -to evaluate accurately and discuss findings with peers</p> <p>SEN/G&T: -differentiated resources, small group work, adult support, partner extended vocabulary, deeper questioning, supporting others,</p>
Science	<p>Spring and new life Materials that toys are made of Simple forces – pushes and pulls, magnets Bird survey</p>	<p>Key knowledge: -identify different garden birds using pictures for support - know that toys are made of different materials - explore and name materials such as wood, metal, plastic -describe signs of new life outside</p> <p>Key skills: -Know that a force is a push or a pull -Give an example of a force in the classroom -Name at least 4 garden birds -Count birds in a simple survey - identify different forces push, pull</p> <p>SEN/G&T: - Visual resources to match - Adult modelling and support - Examples of toys made of different materials to refer to. - Provide objects that demonstrate more than one force to extend - Compare birds which look similar e.g. crow and blackbird</p>	<p>Living things and their Habitats Classifying animals into 5 groups life cycles mini-beasts Living and non-living Bird watch week</p>	<p>Key knowledge: -to know the life cycle of an animal -to know the 5 classification groups -to know what a habitat is and why it suits that animal -garden bird identification</p> <p>Key skills: -to categorise animals mammal/birds/reptiles/amphibians /fish -to compare habitats and micro habitats -to know the basic needs of an animal and record data</p> <p>SEN/G&T: -visual resources/practical application, group and paired work Extended vocabulary make comparisons and frame their own questions</p>	<p>Electricity</p>	<p>Key knowledge: -Know how electricity is produced -Electrical safety -What uses electricity -Batteries/cells/mains power -Open/closed circuits/loop/series -Conductors and insulators</p> <p>Key skills: -Making predictions -Problem solving, investigating as to whether circuits work, scientific drawing, simple electric circuit games -following instructions to build circuits, experiment with power and components</p> <p>SEN/G&T: Simplified circuits -supporting circuit cards/templates -Adding additional components -Begin to think about parallel circuits</p>	<p>Electricity Properties of materials including magnetism, solidity, solubility, and conductivity</p>	<p>Key knowledge: -To know how electricity flows and how energy moves, flow of electrons -Know how electrical circuits work and how to find and fix problems in circuits, troubleshooting -Scientific symbols - how to use them -understand properties of materials</p> <p>Key skills: -creating circuits and manipulating materials, troubleshooting circuits -understanding of flowing energy -to know and recall scientific symbols, draw circuits and consider drawings effectiveness -analyse electrical circuits and explain thoughts and knowledge</p> <p>SEN/G&T: -1:4 groups work, supported materials and diff. objectives/ goals -simplified materials and resources -templates and adult support -extended objectives and aims -leading groups and supporting peers -consider parallel circuits and how to increase decrease flow</p>
Science	<p>Light, dark, and shadow Whales –types, diet, habitat Floating/ sinking Mammal Blowhole fin baleen teeth Rockpool life Seasonal changes Summer</p>	<p>Key knowledge: -to know that some objects float (on top of water) and some sink (go to the bottom) -Whales are mammals like humans and feed young milk, breathe air -Shadows are formed when light is blocked - sources of light</p> <p>Key skills: -name at least 3 light sources -know 3 facts about a whale -predict and evaluate</p> <p>SEN/G&T: -picture representations, key vocabulary/ paired work -making comparisons, extended vocab, use books for own research</p>	<p>Humans Body parts, senses, basic needs, growing, food groups, healthy</p>	<p>Key knowledge: -to identify the different parts of the body -to learn what the senses are and what they do -to understand basic needs of a human -to identify what a healthy diet is -to understand how to stay healthy</p> <p>Key skills: -to identify body parts -to design a healthy meal -to recognise the importance of our sense</p> <p>SEN/G&T: -picture representations, key vocabulary/ paired work -making comparisons, extended vocabulary -to create and exercise routine</p>	<p>Living Things and their Habitats know that humans have an impact on the environment – positive and negative impacts Plants</p>	<p>Key knowledge: -Movement, Respiration, Sensitivity, Growth, Reproduction, Excretion, Nutrition, Habitat, Seasons, Environment, Pollination, Photosynthesis, water transportation, xylem, stigma, leaves, flower, roots etc -to know that organisms can be classified, vertebrates, invertebrate -herbivore, carnivore, omnivore -habitat, environment, locality</p> <p>Key skills: -classifying and identifying -making and recording observations -researching -making prediction -investigation write-up</p> <p>SEN/G&T: -simplified means of classifying e.g., Venn, tables -vocabulary simplified, pictorials -branching diagrams with more complex organisms -other ways of recording or making observations</p>	<p>Classifying Materials Reversible and irreversible changes</p>	<p>Key knowledge: - what reversible and irreversible mean - to understand scientific concepts including magnetism, solubility conductivity, buoyancy, opaqueness and absorption. - to be able to plan and execute an experiment, understanding a scientific write up - understand and evaluate results</p> <p>Key skills: -classify, group and test materials - create own investigation and accurately record method and results - making predictions and explaining results, evaluate findings - consider fair testing/validity</p> <p>SEN/G&T: -support when classifying, small groups and resources, smaller items to sort, using touch to sort, physical objects, remove sensory stimuli -wider variety of materials, conductivity experiments, dissolving, evaporating , leading groups</p>

<p>Science</p>	<p>Making bridges Keeping things hot and cooling things down Making magic porridge What do seeds need to grow? (grass seed) Shadows and light sources Seasonal changes - Autumn</p>	<p>Key knowledge: -there are different kinds of bridges shape and materials used to build them. -name 2 famous bridges (tower bridge and Sydney Harbour Bridge) -living things are either plants or animals -plants grow from seeds and grass is a plant -temperature measures how hot/cold something is</p> <p>Key skills: -prediction, observation and evaluation during testing -team work when making bridges -use a simple thermometer</p> <p>SEN/G&T: -short instructions/ visual aids/ adult support/ group work -read thermometer accurately and form a conclusion e.g. grass needs light to stay green</p>	<p>Plants -growing cress/sunflower -compare plants and their needs -parts of a plant -bird week</p>	<p>Key knowledge: -identify and describe structure of plants -structures of a plant -explore habitats and growth -to understand basic needs of a plant -to perform a simple experiment -how plants have adapted to different weather conditions</p> <p>Key skills: -compare and evaluate -experimenting; understanding the importance of a fair test -to make observations and record data simply and accurately -to make predictions</p> <p>SEN/G&T: -short instructions/ visual aids/ adult support/ group work -photosynthesis for G/T</p>	<p>Forces Magnets</p>	<p>Key knowledge: -understand that force is a push or pull on an object with another force -Gravity is a force constantly in action pulling objects towards the centre of the Earth -learn about Isaac Newton -sinking and floating - upthrust -air resistance -know that magnets attract or repel -magnetic forces act at a distance</p> <p>Key skills: -compare how objects move on different surfaces (friction) -record data and interpret results to make conclusions -predict and investigate -compare and group material based on their magnetic properties</p> <p>SEN/G&T: -simpler prediction/ investigations such as the materials to investigate in floating and sinking, fewer surfaces to investigate friction -understand streamline design -know how a vacuum works -different ways of presenting data</p>	<p>Animals and Humans Evolution and Inheritance</p>	<p>Key knowledge: -to understand how animals and humans change over time -to recognise significant life events -to categorise and group animals and living things -to understand the Theory of Evolution and the impact of Charles Darwin's discoveries on the world -to understand how animals and plants adapt to environments, adapt and evolve</p> <p>Key skills: -comparing and contrasting -evaluating and making predictions -use scientific data to support/refute -record data/ methods, fair tests</p> <p>SEN/G&T: -present data in chosen method, find sources of error, reason explanations, research Charles Darwin's life/ theories -make simple predictions, peer work</p>
<p>Science</p>	<p>Space -moon and space travel -simple forces -pushes and pulls -gravity -magnets -how light travels through materials</p>	<p>Key knowledge: - name objects in space -to know that a force is a push or pull on an object -understand how light travels</p> <p>Key skills: -experimenting with light and forces -using and care of magnets</p> <p>SEN/G&T: -adapted experiments - exploring poles, attract/repel</p>	<p>Seasonal Changes -daily weather -comparing UK weather to another country -Equator, northern and southern hemisphere, hibernation, migration</p>	<p>Key knowledge: -to identify different types of weather -to know where the equator, northern and southern hemisphere are located -weather comparisons between the UK and another country -to know the meaning and reasons behind hibernation and migration</p> <p>Key skills: -to monitor and record the weather using a rain gauge, Beaufort scale and symbols. -to make comparisons and identify patterns -to record data accurately -to work scientifically</p> <p>SEN/G&T: -simplified resources, adult support, paired and group work -research, leading others, making comparisons</p>	<p>Animals (gc humans) -nutrition -food chains -skelton and organ knowledge -types and functions of teeth</p>	<p>Key knowledge: -know main food groups -understand role of teeth and organs in digestive system -know how energy transfers through a food chain</p> <p>Key skills: -explaining and describing -recording food diaries -researching food groups/ balanced meals</p> <p>SEN/G&T: -simplified food group resources -adult support/ diff. resources -research into functions, effects of food/comparing groups</p>	<p>Earth and space -understanding the solar system and orbits -research and know about the moon landing and space race -understand moon reflection -understand air and wind resistance -use pulleys and levers</p>	<p>Key knowledge: -to know the planets and the solar system layout/ gravity -to know the events of the moon landing -to know how forces act/ interact -to know how the sun produces light and how the moon reflects light -to understand forces on earth and in space, using pulleys/ levers</p> <p>Key skills: -experimenting and designing experiments -accurate recording and analysing results -to accurately use pulleys and levers -to recall and know scientific facts -to work as a productive team mate</p> <p>SEN/G&T: -adapted experiments and word bank -adult support/paired work -extending to phases of moon, differences in days/distances of planet</p>
<p>Science</p>	<p>Dinosaurs Fossils Animals that lay eggs Meat/plant eaters Extinction and endangered animals Camouflage Summer seasonal changes; including the weather Volcanoes Making volcanoes</p>	<p>Key knowledge: -dinosaurs lived a long time ago and are no longer alive i.e. they are extinct -we know about dinosaurs because we have found fossils -it is not just birds that lay eggs</p> <p>Key skills: -interpret pictures and find information from books -look at physical features of a dinosaur and say whether it is a plant/meat eater -sort dinosaurs into groups by physical features -describe at least 3 things that tell you we are in Summer</p> <p>SEN/G&T: -visual resources, adult support -forming opinions and giving reasoning to answers</p>	<p>Living things and their habitats; ocean animals, food chains, needs, layers of the ocean, pollution</p>	<p>Key knowledge: -to understand the basic needs of ocean animals -to know how a food chain works -to know the layers of the ocean -Forces- how things move on different surfaces, floating, sinking, wind power and magnetic</p> <p>Key skills: -to make comparisons between ocean animals and woodland animals -to identify reasons for habitats -to know how we can save our oceans -how pollution is affecting our oceans, seas and the creatures living in it -to experiment fairly -to work scientifically and make predictions</p> <p>SEN/G&T: -visual resources, adult support, group and paired work -forming opinions and giving reasoning to answers</p>	<p>Light and Sound</p>	<p>Key knowledge: -To know that light travels in a straight line -sources of light (natural and manmade) (reflections of moon) -Know how shadows are formed and how they change throughout the day -To know that sound travels in waves and how we hear sound</p> <p>Key skills: -classify sources of light in different ways -able to make predictions on the length of shadows and the pitch/volume created by dropping an object from different heights onto a drum -carry out a test changing one variable at a time and keeping it a fair test -can record data in different ways using different instruments and interpret results to make informed conclusions</p> <p>SEN/G&T: -picture differentiation, visual aids -key vocabulary/ paired work/expectations on conclusions -extended vocabulary, classifying, sorting, and experimenting -other ways of recording or making observations - phosphorescence</p>	<p>Health and our lifestyles – how we stay healthy Impact of alcohol and drugs on our bodies Circulatory and digestive systems Light The eye</p>	<p>Key knowledge: -to know what healthy and unhealthy mean, what drugs and alcohol are -to know that our actions have an impact on our bodies -to know how our circulatory system works -to know how we digest food -to know how light travels and how it is accepted by the eye for us to see.</p> <p>Key skills: -understand dangers of unhealthy lifestyles and consider how to be healthy, to know our decisions have an impact on our lives -to label and understand the circulatory and digestive systems -to understand exercises effect on the circulatory system -to name body parts and systems -to explain knowledge and thinking -to evaluate learning and compare to prior knowledge -to investigate light and how light travels, creating experiments of light</p> <p>SEN/G&T: -word mats, differentiated resources, visual aids, ClickR resources, 1:1 adult support, simplified investigations/ expectations -extended expectations and investigating fair testing, recording formal scientific write up, instructions</p>

SEND in Science

All of our learners are included in all of our lessons where appropriate, and adaptations are made to enable our learners to access the learning. All teachers at Ingoldsthorpe Primary School have extensive knowledge of their students and are able to make reasonable adjustments to enable all children to participate and learn with their peers. Reasonable adjustments will be made in communication with parents and always at an appropriate stage for each specific child.

Adjustments may include;

- Adapted objectives and learning resources to meet a child's cognitive ability
- 1:1 sessions with a trusted adult
- Small group sessions
- Coloured and adapted visual resources
- Support in class with an adult
- Limited vocabulary and objectives
- Scaffolded pre learning
- Adapted and bespoke images/ visuals
- Parental support paperwork where needed
- Supported recapping of the learning to avoid misconceptions
- Hands on activities and sensory breaks where needed



Most able children in Science

Those children who appear to be the most able in Science will have deepened opportunities and will have lesson adapted to ensure that their talents progress. In Science they will have opportunities to lead, support other learners and discuss in smaller groups. Children in Year 3 and 4 will have the opportunity to work on practical investigations with pupils from the local High School during British Science Week.

Impact of Science

We believe that our science curriculum is progressive and challenging, whilst remaining relevant. It is carefully planned to demonstrate progressions. We measure the impact of our curriculum in several ways, which includes: learning walks, pupil voice, lesson observations and identifying key skills to aid teacher assessment.

Upon completing primary education, our students leave with a fun, high-quality science education, fostering a genuine love for inquiry. They exhibit:

Passion for Science: Inspiring continued interest in further study and careers.

Real-Life Knowledge Retention: Grasping science with real-life relevance.

Critical Thinking: Questioning ideas critically and reflecting on knowledge.

Articulate Understanding: Expressing comprehension with rich, scientific language.

Disciplinary Skills: Proficiently organising, recording, and interpreting results.

Collaborative Learning: Thriving in practical investigations.