Winwick Church of England Primary School

Science Policy

In God's love, aspire and achieve to be the best'

1 Corinthians 16:14 'Do everything in love.'

Written by N. Henaghen

At Winwick C.E, the children learn that they are part of the Christian community and Christian World. They are taught through a values led approach with Christ at the centre of everything. All members of the school community are children of God and should be treated with love, respect and care. We ensure that all members of the school community respect, tolerate and celebrate the science curriculum by following the teachings of the Lord so that we can all aspire and achieve in God's love. This is driven by our core Christian Values of love, perseverance and respect. It is lived out in our mission statement through the love of God and our love of one another and how we respect all things and the world we live in.

AIMS OF SCIENCE POLICY

Our Science Policy follows The National Curriculum 2014 for Science Guidelines and aims to ensure that all pupils:

- Develop **scientific knowledge and conceptual understanding** through the specific disciplines of biology, chemistry and physics.
- Develop understanding of the **nature, processes and methods of science** through different types of science enquiries that help them to answer scientific questions about the world around them.
- Are equipped with the scientific knowledge required to understand the **uses and implications** of science, today and for the future.
- Through high quality science teaching, we aim to help our pupils understand how major scientific ideas have played a vital role in society. Moreover, we aim to prepare our pupils for a life in an increasingly scientific and technological world.

INTENT - PURPOSE OF STUDY-WHY TEACH SCIENCE?

A high-quality science education provides foundations for understanding the world. Science has changed our lives and is vital to the world's future prosperity. Through building key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rationale, explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how key knowledge and concepts can be used to explain what is occurring, predict how things will behave, and analyse causes. This understanding should be consolidated through their appreciation of applications of science in society and the economy.

In teaching science we are developing in our children:

- A positive attitude towards science and an awareness of its fascination, building on curiosity and sense of awe of the natural world;

- their enjoyment and interest in science and an appreciation of its contribution to all aspects of every day life;
- an understanding of science through a process of enquiry and investigation;
- confidence and competence in scientific knowledge, concepts and skills;
- an ability to reason, predict, think logically and to work systematically and accurately;
- an ability to communicate scientifically, allowing them to articulate science concepts clearly and precisely;
- the initiative to work both independently and in co-operation with others;
- the ability and meaning to use and apply science across the curriculum and real life.

Teaching and Learning

At Winwick CE, teachers plan and deliver high-quality and engaging science lessons incorporating a range of teaching and learning styles. Topics are planned using the resources and ideas from 'Focus Education' and are taught using a cross-curricular approach. Our teachers will provide opportunities for pupils to:

- learn about science, where possible, through first hand experiences;
- develop their research skills through appropriate use of secondary source;
- plan and carry out investigations with an increasing systematic approach as they progress through the school;
- develop their understanding of the different types of scientific enquiry - classification, observing over time, pattern seeking, fair tests, research and provide opportunities for scientific enquiry in every lesson;
- develop their questioning and answering skills, as questions are at the heart of every science lesson;
- use a wide range of ICT equipment, including data loggers, digital microscopes, video and digital cameras;
- use scientific contexts to develop and consolidate cross curricular skills in English, Maths and ICT;

- be motivated and inspired by engaging interactive science displays, which include key vocabulary and relevant questions;
- learn about science using the outdoor environment.

IMPLEMENTATION

PLANNING

School curriculum

Science in the Early Years Foundation Stage is planned using the Early Years Curriculum 'Understanding of the world'. Key Stage 1 and 2 teachers plan science lessons using the National Curriculum (2014). When planning, teachers will ensure that the National Curriculum statutory requirements are being covered through the specific disciplines of biology, chemistry and physics (teachers may also refer to the non-statutory guidance which provide additional support). The programmes of study for science are set out year-by-year for Key Stages 1 and 2. We are however, only required to teach the relevant programme of study (Domians) by the end of the key stage. Within each key stage, school has the flexibility to introduce content earlier or later than set out in the programme of study and may introduce key stage content during an earlier key stage, if appropriate.

Teachers base their planning on the programmes of study for their relevant year groups and ensure the coverage is within and beyond national expectations, aiming for children to make progress in line with national expectation and above throughout the academic year. Working scientifically is embedded throughout all areas with the EYFS, KS1 and KS2, which focuses on the key aspects of scientific enquiry, enabling children to ask and answer questions. Teachers can use a range of resources to support with learning, in Science we use TIGTAG Science along with STEM Learning.

Scientific knowledge and conceptual understanding

The programmes of study describe a sequence of knowledge and concepts. Whilst it is important that pupils make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage.

Pupils should be able to describe processes and key characteristics of science, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary. They should also

apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data.

Differentiation

The study of science will be planned to give a suitable range of differentiated activities appropriate to their age and abilities. Tasks will be set which challenge all pupils, including the more able. For pupils with SEND the task may be adjusted or given pupils may be given extra support. The grouping of pupils for practical activities will take account of their strengths and weaknesses and ensure that all take an active part in the task and gain in confidence. Gifted and Talented pupils will be challenged further to develop their Greater Depth skills.

Educational Visits

Each year group are required to undertake at least one science related educational visit per year (this can include a visitor from the school).

Teacher knowledge and understanding

CPD

The subject leaders are to support any member of staff with subject knowledge and delivery of the new Science curriculum throughout any point in the academic year. The CPD will be offered through:

- sharing outstanding practice in Science;
- working closely with staff during different stages of planning;
- provide opportunities for the staff to attend external training opportunities within subject specific areas;
- team teaching and team planning with appropriate year groups.

IMPACT

Assessment

In the EYFS, teachers assess against the 'Development Matters' statements in the 'Understanding of the world', area of the Early Years Curriculum.

Formative assessment is carried out through the use of effective Assessment for Learning (AfL) which are used to inform teachers planning and teaching. AfL is carried out in a variety of ways including; pupil observations, pupil discussions, marking and pre-assessment tasks. Within KS2, individual mind maps will be created at the start of a unit and these will be added to throughout the course of the unit using purple pen. Within KS1, class mind maps will be created and added to. To gain further evidence of children's knowledge and understanding, from Year 2 upwards, retrieval quizzes and reflections will be used each week and recorded in children's books. Assessment will be informed by work in books. During practical activities, video and photographic evidence will be used to monitor children's learning and understanding (which can be found on the Winwick Primary Google Drive in the assessment folder).

Summative assessment will be carried out every half term throughout the year and progress will be tracked via the Foundation Subject Tracking Document. To aid with assessment key curriculum and challenge questions will be used and adapted from the Focus Education Not As We Know It Download document. Within a child's book or through discussions children will be able to answer the key questions from the document to be working at the expected standard. For a child to be assessed at Greater Depth there should be evidence of the children answering the 'challenge questions'.

Assessing pupils with SEND will include photo and video evidence that demonstrates how they are achieving the different learning objectives.

From 2016 a sample of schools will continue to participate in the End of Key Stage 2 tests.

Attainment targets

At Winwick CE we will ensure that all staff, including those in a supportive role, have a clear idea of the concepts and skills to be taught. The importance of Attainment Target 1 (Experimental and Investigative Science) which has a fifty percent weighting at Key Stage 1 and a forty percent weighting and Key Stage 2, will be stressed. The other Attainment Targets (AT2, AT3 and AT4) will be taught using an experimental and investigative approach. By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

MONITORING AND EVALUATION

Monitoring will be carried out each term and may include the following:

- monitoring and evaluation of pupils work (work in books);
- lesson observations;
- pupil and staff interviews;
- planning and assessment monitoring;
- learning walks.

Monitoring and evaluation will be shared with link Governors.

SAFETY

Following COSHH guidance, ‘be safe’ book and school's health and safety policy as outlined on our school website. Teachers at Winwick will plan safe activities for science and complete a risk assessment if necessary. All staff involved with science teaching must be aware of health and safety procedures when using science resources including chemicals, food and living things. Staff will check scientific equipment regularly and report any damage, taking defective equipment out of action. Defective equipment will be passed on to the Subject leaders or the maintenance officer for recycling. Children will also be made aware of the need for personal safety and the safety of others during science lessons. Where possible links will be made to PSH and Wellbeing and children will be involved with risk assessments.

REPORTING TO PARENTS

Following whole school policy based on National Requirements and WBC guidelines. Parents will be well informed of their child's progress through Autumn and Spring term parents' evenings and written annual reports. Parents will be encouraged to develop positive attitudes to science and actively support their children when homework is given.

MARKING WORK

Refer to the whole school policy.

Resources

Science resources are stored in a large cupboard and trays within the Lower Key Stage 2 Department. An inventory of resources is kept on the school server and is updated when new resources are ordered. When staff require new resources they should put in an order request to the subject leaders.

Role of the Subject Leaders

The subject leaders will provide professional leadership and management for science and will ensure that it is managed and organised so that it meets the needs and objectives of the school. The subject leaders will monitor teaching and learning within the subject and will initiate reviews of schemes of work and planning. The subject leader will manage the resources and budget for Science.

Science Curriculum Coverage with Scientific Enquiry

EYFS	**All about Me** Body Parts - My Senses. Harvest around the world.	**Seasons** Colours and Light- Bonfire Night, Diwali & Christmas - Christmas around the world - Change in the seasons - Shadows	**Space** Space – Names of the planets. Space journeys to the moon and astronauts. Electricity. Forces and Motion	**Life Cycles & Habitats** Mini Beasts**,** Life Cycles**,** Food Chains**,** Healthy eating	**Living Things** Where does food come from? Growing in the garden, Life on the farm, Baby Animals.	**Properties of Materials** Materials, Sound and Hearing, Our own physical development
Year 1	Every day materials **-Identifying and classifying** **-Fair testing**	Seasonal Changes **- Observations** **-Pattern seeking**	Animals including humans -Carnivores, herbivores, omnivores and animal groups **- Identifying and classifying.** **- Research**	Seasonal Changes (recap)	Plants -Parts of a plant **-Research** **-Observations over time.** **-Fair testing**	Plants
Year 2	Living things and their habitats		Use of everyday materials	Animals including Humans	Plants -Trees, wild and	Environmental issues and recycling

	-Observing **-Identifying and classifying**		**-Identifying and classifying** **-Fair testing**	-Life cycles, animal needs, exercise diet and hygiene. **-Patter seeking.** **-Research** **-Observations over time.**	garden plants. Text – Little Evie in the wild wood. **-Pattern seeking – do taller plants grow from bigger seeds.** **-Observations over time**	**-Research** **-Observations over time.** **-Pattern seeking** Review and Recap on all Topics
	Rocks Book: Street Beneath My Feet (Link to Stone Age) -Organic matter, Soils and Fossils. **Identifying and classifying** **Research**	Plants Book: The Night Gardener **- Observations over time** **-Pattern seeking**	Light and Dark Book: Orion and the Dark (Link to Geography in SP2) night and day **Fair Testing** **-Observations** **-Research**	Animals and Humans Book: Funny Bones (PE Link Health and Fitness) -Nutrition, Muscles and Skeletons **-Research** **-Pattern seeking** **-Classification**	Fizz Pop Bang (optional unit – NH) Working Scientifically	Magnets and Forces Book: The Iron Man **-Fair testing** **-Research**
Year 4	Living Things -Classification Keys -Environment changes. **-Pattern seeking** **-Identifying and**	Animals including Humans - Teeth, digestion and Food chains. **-Pattern seeking**	Sound -Vibrations, pitch and Volume. -**Pattern seeking** **Fair Testing**	States of Matter -Solids, liquids & gases. - Changes, heated	Electricity -**Pattern Seeking** **-Fair Testing** **-Research**	Revision of Light Working Scientifically

	Classifying	**-Research** **-Identifying and Classifying.** -**Fair Testing**	**-**	and cooled. -Water Cycle. **-Fair testing** **-Observing over time** **-Research**		**-All** **Review and Recap**
Year 5	Forces -Levers, pulleys and gears. -Gravity, air & water resistance, friction. **-Fair Testing** **-Classifying and identifying**	Properties and changes of materials. **-Fair testing** **-Pattern seeking** **-Observations**	Earth and Space -**Research**	Living Things -Life cycles -Reproduction and Plants **-Observing over time** **-Research** **-Classification**	**Super Scientists** Working Scientifically **-Classifying and identifying** **-Research** **-Fair Testing** **-Pattern Seeking**	Animals including humans - Changes to old age. -Puberty **-Changes over time** **-Research** **School Nurse Visit**
Year 6	Evolution and Inheritance. -changes over time -offspring -adaptation and evolution. -**Classification** **-Research**	Living things and their habitats -Variation and classification - **Research** **-Classification**	Electricity -**Fair Testing** **-Research** **-Pattern Seeking** **Properties and changes of materials – Cabbage Lady**	Animals including humans - Circulatory systems - Nutrient and water transportation Diet and Drugs -**Fair Testing** **-Observations**	Light and Sound -**Fair testing** **-Pattern seeking** **-Observation**	Scientists

				-Researching **-Pattern Seeking**		