**St Oswald’s RC Primary School**

**Science Guidance September 2017**

Our rationale for teaching science
Science is a core subject. Within our school, science 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 their knowledge and understanding of scientific ideas. Children learn to ask scientific questions and begin to appreciate the way science will affect their future on a personal, national and global level. The main aspects of science to be taught will be determined by the programmes of study of the National Curriculum and the guidance for the foundation stage documentation – Development Matters.

This document outlines the school’s philosophy regarding the teaching of science. The policy was formally drawn up by the subject leader after a review of the current provision and discussions with staff. Its implementation is the responsibility of all members of staff. It will be reviewed periodically.

Our aims in teaching science include the following:

* Preparing our children for life in an increasing scientific and technological world
* To foster concern about, and active care for, or environment.
* To build on our children’s curiosity an sense of awe of the natural world

ATTITUDES

* To develop a positive attitude, enthusiasm, enjoyment and interest towards science
* To promote positive attitudes towards health issues
* To encourage open-mindedness, self-assessment, perseverance and responsibility
* To develop our children’s social skills to work co-operatively with others in a variety of situations

SKILLS

* To encourage our children to ask and answer scientific questions, using accurate scientific terminology both orally and in written work.
* To teach our children how to plan and carry out scientific investigations, using their skills of: predicting, fair testing, observing, recording evidence and drawing conclusions
* To develop skills of collecting and interpreting data from scientific investigations
* To develop our children’s ability to record results in an appropriate manner including the use of diagrams, graphs, tables and charts.
* To give our children an understanding of scientific processes: biology, chemistry and physics and the terminology associated with all these areas of science.
* To develop the application of ICT in investigating, researching and recording scientific ideas.
* To enable our pupils to become effective communicators of scientific ideas, facts and data.

Statutory Requirements

The statutory requirements for the teaching and learning of science are laid out in, The National Curriculum in England Framework Document for Teaching, September 2014 and the Statutory framework for Early Years Foundation Stage, September 2014

Our Teaching Aims

We aim to teach science in ways that are imaginative, purposeful, well managed, creative and enjoyable. Our teaching includes clear and accurate explanations and offering appropriate questioning to take learning further. We ensure that links are made to other areas of the curriculum to ensure our children can apply their scientific knowledge and understanding.

Our pupils will develop scientific knowledge and conceptual understanding through the disciplines of biology, chemistry and physics. We will also develop the understanding of the nature, processes and methods of science through different types of science enquiries that them our pupils to answer scientific questions about the world around them. Furthermore we will ensure that our pupils are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Teaching and Learning Style

We use a variety of teaching and learning styles within our science lessons. Our main aim is to encourage, motivate, engage and inspire our children in order to develop their knowledge, skills and understanding of science.

We may do this in the following ways:

* Whole class direct teaching
* Investigative group or whole class activities, either child initiated or teacher led
* Role play
* Discussion – pairs, groups, whole class
* Researching using ICT and various texts
* First hand experiences of real scientific activities – carrying out a practical experiment and analysing the results
* Concept mapping
* Problem solving activities

We recognise that in all our classes our children have different scientific abilities; we ensure that we provide suitable learning opportunities for all children by matching the challenge of the activities to the ability of the child.

We may do this in a variety of ways:

* Providing open ended-tasks
* Differentiation
* Grouping children by ability – children swapping classes for science to ensure they are provided with suitable learning opportunities for their specific ability
* Using our teaching assistants to support/extend the thinking of individual children or groups of children.

The Science Curriculum within our school

The programmes of study for science are set out year-by-year for key stages 1 and lower key stage 2 and upper key stage 2. Schools are, however, only required to teach the relevant programmes of study by the end of the key stage. Within each key stage, schools therefore have the flexibility to introduce key stage content during an earlier key stage if appropriate. All schools are also required to set out their school curriculum for science on a year-by-year basis and make this information available online.

Planning for science is a proves 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 the World’ in the Early Years Foundation Stage.

Science teaching involves adapting and extending the curriculum to match all pupils’ needs. Where possible, science will be linked to class topics, but will also be taught as discrete units and lessons to ensure coverage. Due to the mixed year groups in key stage 2 science units within lower key stage 2 are taught on a two year rolling programme – 2015-16 following year 4 POS, 2016-17 following year 3 POS. This ensures that the progression between year groups and guarantees topics are covered.

We carry out our curriculum planning in 3 phases-

* Long Term Planning – completed annually by the subject leader and in liaison with class teachers and Senior Management Team, according to the make up of the school for that particular year.
* Medium Term planning Key weekly questions – completed by the class teachers
* Short Term Planning – completed by the class teachers – within their IWB screens – these screens need to show WALT and WILF, differentiation, use of TA, Starter tasks (differentiated where appropriate), plenary and mini plenaries, open ended questions and challenges to take learning further, self-evaluation

Key stage 1

The principle focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

Working Scientifically in Key Stage 1

This is described separately in the programme of study, but must always be taught through and clearly related to the teaching of substantive science content in the programme of study. Within the long term plan links are made to show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

Lower Key Stage 2 – Years 3-4

The principle focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationship between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

Working Scientifically in Lower Key Stage 2

This is described separately in the programme of study, but must always be taught through and clearly related to the teaching of substantive science content in the programme of study. Within the long term plan links are made to show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

Upper Key Stage 2 – Years 5-6

The principle focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.

Working and Thinking Scientifically in Upper Key Stage 2

This is described separately in the programme of study, but must always be taught through and clearly related to the teaching of substantive science content in the programme of study. Within the long term plan links are made to show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read. Spell and pronounce scientific vocabulary correctly.

Science in the Foundation Stage

We teach science in the foundation stage as an integral part of topic work. Our pupils will make predictions, use their senses and investigate materials and their properties. Pupils are encouraged to use their natural inquisitiveness, while taking part in exploratory play in specific scientific areas as well as areas that link across the EYFS framework. Science is taught through the strand ‘Understanding of the World’. There are cross curricular links made to enhance the teaching and learning of science and to enable our children to apply their knowledge, understanding and skill in a variety of curriculum areas. We relate the scientific aspects of the children’s work to the objectives set out in the guidance for the EYFS – Development Matters This underpins the curriculum planning for children from birth to 5. We use all areas within the foundation stage setting to promote scientific knowledge. Understanding and application of scientific enquiry skills – role play area, sand and water play, construction area. The play based activities are a mixture teacher led and child initiated. We use a variety of resources to deliver science in the foundation stage including the Collins guides and pupil books. Pupils will be given more of an opportunity to plan their own activities and develop their own independence in their own learning.

Science and Inclusion – SEND and Gifted and Talented Pupils

As a school we ensure that all children and staff are treated fairly and equally. All children have equal rights to access all areas of the curriculum, regardless of race, gender and disability. Within this subject area, the SMT and all staff endeavour to provide the appropriate provision for this to occur. This policy follows the guidelines and practices that are stated and outlined in St. Oswald’s Equality Scheme.

Thorough our science teaching we provide appropriate learning experiences that enable all our children to make progress and achieve their potential. We strive hard to meet the needs of our children with special educational needs, those with disabilities and our children who are gifted and talented. We ensure the curriculum we plan is accessible to meet the needs of all our children.

Our children who have been identified as having Special Educational Needs may need intervention through School Action or School Action Plus this means children will have an Individual Education Plan with child specific targets which may include targets within science.

Gifted and Talented children will be identified and suitable learning challenges provided.

In our school we try where possible to provide our children with a range of learning opportunities including activities outside the classroom – around the local area or class visits to museums. It is the class teacher, subject leader and Senior Management Teams responsibility to ensure risk assessments have been completed and appropriate strategies are in place before our children and adults leave school.

Assessment For Learning

Assessing Pupil Progress (APP) – Ongoing Teacher Assessment

As teachers we make professional judgements during lessons this informs the next steps in children’s learning. Class teachers identify individuals or groups of children to complete assessments on during the lesson and record the outcome on their short term planning again to inform the next steps for the children. We assess in a variety of ways:

Observations

* Questioning – open and closed
* Discussion – peer to peer, child to teacher
* Completed work – indicating near the learning objective title whether a child has achieved or not yet achieved that particular learning objective
* APP guidelines for science is used to monitor progress and achievement within each science session by classteacher and teaching assistant to inform planning, next steps for learning and pupil achievement.

Role of the Subject Leader

* The subject leader will provide professional leadership and management for science and will ensure that it is managed and organised so that it meets the aims and objectives of our school. The science subject leader has specifically allocated time each week to complete the role of subject leader
* The subject leader will also Identify areas for improvement and set targets and implement the science development plan
* Complete termly action plans (reviewed termly)
* Peer coaching
* ensure that staff training is completed by appropriate staff to ensure the teaching, learning and assessment of science within our school is taken forward to benefit out children.
* Monitor teaching and learning
* Monitor children’s learning and progress – Rising Stars and teacher assessment analysis
* Hold interviews with children
* Complete work book scrutiny
* Review schemes of work
* Manage resources
* Monitor science displays
* Inform colleagues of new initiatives and issues within science
* Annual report to head teacher highlighting the strengths and weaknesses of science teaching, learning and assessment and indicates action points for the next academic year.

Resources

The subject Leader will be responsible and monitor resources and maintain the stock to meet the needs of the curriculum. The subject leader will be responsible for the allocated budget for science. The specialist pieces of equipment and those posing a potential safety risk will be kept centrally in the subject leader’s classroom and issued to staff when requested. There is a science base (DT cupboard in the hall) where science resources are located – teacher and children’s science resources. There are boxes for each unit of work. There is also a range of ICT software and hardware, CDROMs, and videos to support and enhance teaching and learning. There is a section relating to science within the school library which children can access.

The resources in our school are constantly being updated and renewed. class teachers inform the subject leader when resources need replacing or to indicate resources they need that would impact on the children’s learning.