**Science policy**

**2020-2021**

**Intent**

Rationale

At Southwick Primary School, the intent of our science curriculum is to ensure all children leave the school with a secure foundation of scientific knowledge and practical skills. This understanding will help to ensure all children are well equipped for any potential future learning and employment in the scientific field. We believe that science stimulates and excites children’s curiosity about phenomena and events in the world around them. With this in mind, we focus on building and developing children’s science capital to ensure teaching and concepts are relevant and relatable for all children in school.

Science teaching at Southwick Primary School is about developing children’s ideas and ways of working that enable them to make sense of the world in which they live. This is done through teaching of scientific knowledge and concepts as well as a focus on investigating and working scientifically.

Aims

At Southwick Primary School, we follow the essentials curriculum. For science, this primarily follows the national curriculum as well as including a range of non-statutory learning opportunities to broaden and deepen children’s scientific knowledge and develop their science capital. The intent of this curriculum is that through a range of threshold concepts, children tie together subject topics into meaningful schema. Children return to the same scientific concepts over and over and gradually build understanding of them. The aims of the national curriculum for science state that learners acquire scientific knowledge and cultural understanding, earners understand the nature process and methods of science and earners understand the uses and implications of science today and for the future. Following these ideas, the essentials curriculum sets out a number of aims for science teaching:

* The ability to think independently and raise questions about working scientifically and the knowledge and skills that it brings.
* Confidence and competence in the full range of practical skills, taking the initiative in, for example, planning and carrying out scientific investigations.
* Excellent scientific knowledge and understanding which is demonstrated in written and verbal explanations, solving challenging problems and reporting scientific findings.
* High levels of originality, imagination or innovation in the application of skills.
* The ability to undertake practical work in a variety of contexts, including fieldwork.
* A passion for science and its application in past, present and future technologies.

We also aim to ensure that the relevant aspects of the Knowledge and Understanding of the World curriculum in the EYFS lays strong foundations for the national curriculum aims.

Skills progression

Our Science curriculum ensures that the threshold concepts are taught progressively. These areas are: plants, animals including humans, everyday materials, living things and their habitats and seasonal change in Key Stage One. This is followed by plants, animals including humans, rocks, light, forces and magnets, living things and their habitats, states of matter, earth and space, evolution and inheritance, sound and electricity in Key Stage Two. Scientific enquiry skills are also taught progressively, as laid out in the National Curriculum Framework:

Through the working scientifically threshold concept (milestone 1), children will be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

* asking simple questions and recognising that they can be answered in different ways
* observing 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.

Through the working scientifically threshold concept (milestones 2 and 3), the following practical scientific methods, processes and skills through the teaching of the programme of study content:

* 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
* planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
* recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
* identifying scientific evidence that has been used to support or refute ideas or arguments

**Implementation**

Foundation Stage

At Southwick Primary School staff follow the Early Years Learning Goals, planning learning opportunities for pupils. At this stage of learning children develop their understanding of the world around them on a daily basis, using their senses to explore and learn about objects and materials. Children are given holistic learning experiences, incorporating elements of science in their everyday activities. Additionally, the practical nature of science is recognised and opportunities for learning through play and first-hand experience should be provided. Science plays an important role in the development of investigative skills and draws upon strong mathematical links, for example measurement, pattern recognition, graphical skills and data handling.

Key Stage 1

Throughout key stage 1, Pupils are 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 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 is done through the use of first-hand practical experiences, but there is also some use of appropriate secondary sources, such as books, photographs and videos.

Lower Key Stage 2

At Southwick Primary School the principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. Pupils 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 comparative and fair tests and finding things out using secondary sources of information. Pupils draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

Upper Key Stage 2

The principal 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 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, pupils encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They 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 comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils 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. In Key Stage 2 children are provided with a Knowledge Organiser for each unit of work they undertake which outlines the key knowledge and vocabulary they are learning about.

Essentials curriculum

The implementation of our science curriculum is based upon three principles:

* learning is most effective with spaced repetition
* interleaving helps pupils to discriminate between topics and aids long term retention
* retrieval of previously learned content is frequent and regular, which increases both storage and retrieval strength.

Based on the above ideas, teachers ensure that science lessons are planned and delivered to provide children with a number of learning opportunities which support these concepts. For example, POP (proof of progress) tasks are set regularly which give children the chance to retrieve previously learnt content. In addition, the opportunity for continuous provision in the form of daily routines aids retrieval.

Health and safety

Children given suitable instruction on the operation of all equipment before being allowed to work with it. Teachers take advice from CLEAPPS when planning new investigatory work to ensure that classroom practice is safe. At Southwick Primary school, children should be strictly supervised in their use of equipment at all times. Children should be taught to respect the equipment they are using and to keep it stored safely while not in use. Children should be taught to recognise and consider hazards and risks and to take action to control these risks, having followed simple instructions. All staff are aware of pupils with allergies. Any activity which would potential bring a child into contact with an allergen is risk assessed and measures are put in place to ensure no child is put at any risk.

Differentiation

At Southwick Primary School we aim to encourage all children to reach their full potential through the provision of varied opportunities. We recognise that our curriculum planning must allow children to gain a progressively deeper understanding and competency as they move through the learning milestones.

More able learners

More able learners will have their needs provided for through a framework of high quality first teaching which focuses on ensuring the children are challenged appropriately. In addition, we will focus on developing their learning behaviours, including, greater reflection, problem solving and enquiry and making connections. This progress will be tracked to ensure that children meet their learning potential.

SEND/Inclusion

Children who are identified as being on the SEND register will be given support as identified on their Individual SSP’s (student support plans) or OPP’s (one page profiles). Children are supported in the first instance through quality first teaching. Lessons will be differentiated in line with the individual needs of the children. All provision for pupils with SEND is in line with the school’s SEND policy.

**Impact**

We hope that the impact of our curriculum will mean that are aims for science are being met across the school. The science lead and SLT will monitor this through:

* looking at the practises taking place to determine whether they are appropriate, related to our aims and likely to produce results in the long run. This will be done through moderation of planning and children’s work to ensure progression throughout threshold concepts, pupil and teacher voice and lesson observations
* We will use comparative judgement in two ways: in the tasks we set (POP tasks) and in comparing a students work over time.
* Monitoring of the outcomes for children in each year group for science (considering understanding, engagement, attitudes, attendance and data)