**Science Policy**

**Holy Trinity C of E Primary School**

**Aims**

Our Science policy follows the National Curriculum 2014 for Science guidelines and aims to ensure that all pupils:

* Develop a scientific 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 Scientific 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.

**Role of the Subject Leader**

To ensure that all members of the school community understand the vision of Science at Holy Trinity and to lead, challenge and support all in achieving the vision by:

* Ensuring curriculum policies, guidelines and resources are well organised, reviewed, updated and easily accessible
* Maintaining clarity of expectations in relation to planning, assessment and teaching and learning
* Developing standards in teaching and learning by attending CPD and sharing best practice.
* Monitoring, evaluating and developing standards in teaching and learning
* Identifying and addressing strengths and areas for development through termly book scrutinies, learning walks and pupil voice.
* Informing, supporting and providing development opportunities for all
* Responsibility for reporting to the academy councillors, Headteacher and staff about the quality of teaching and the impact on standards

**Purpose of Study**

**Why Do We Teach Science?**

A high quality Science education provides a foundation 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 rational 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 cause. This understanding should be consolidated through their appreciation of applications of Science in society and economy.

The vision of Science at Holy Trinity is one that values:

* A positive attitude towards Science and an awareness of its fascination;
* Children developing an understanding of Science through a process of enquiry and investigation;
* Children having the confidence and competence when articulating scientific knowledge, concepts and skills;
* Children developing an ability to reason, predict, think logically and to work systematically and accurately;
* Instilling the initiative to work both independently and in co-operation with others:
* Equipping children with the ability and meaning to use and apply Science across the curriculum and real life.

**Planning**

The National Curriculum for Science is used as a framework for science content, skills and pupil expectations at our school. 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 by the end of the key stage. Within each key stage, we have 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 will base their planning on the programmes of study for their relevant year groups.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Year | Electricity | Plants | Animals including humans  A | Everyday materials  EM | Seasonal Changes  SC | Living things and their habitats  LH | Rocks | Light  L | Forces and magnets  FM | States of matter  SM | Sound | Properties and changes of materials  PCM | Earth and Space  ES | Evolution and inheritance |
| **1** |  | √ | √ | √ | √ |  |  |  |  |  |  |  |  |  |
| **2** |  | √ | √ | √ |  | √ |  |  |  |  |  |  |  |  |
| **3** |  | √ | √ |  |  |  | √ | √ | √ |  |  |  |  |  |
| **4** | √ |  | √ |  |  | √ |  |  |  | √ | √ |  |  |  |
| **5** |  |  | √ |  |  | √ |  |  | √ |  |  | √ | √ |  |
| **6** | √ |  | √ |  |  | √ |  | √ |  |  |  |  |  | √ |

Long term plans show the coverage and sequence of each topic, however any alterations based on teacher preferences can be negotiated with subject leaders. Medium term plans state clear objectives to be taught within topics, as well as suggestions linked to scientists and inventors. A planned short term block of teaching includes the following key information: topic, year group, term, key vocabulary, coverage ( explaining science, classification, designing experiments, data, tables and graphs and making conclusions), session numbers, Science objectives (including working scientifically), teacher input, activities (including challenge for all), outcome, resources and an overall evaluation of the knowledge, understanding and skills gained. WOW factors and hooks will be used at selected points within topics to improve science capital, provide real life experiences, increase engagement and curiosity as well as reducing the abstractness related to particular topics and vocabulary. Some year groups, when appropriate, work collaboratively to enhance their learning experiences. Hooks could include interviews, videos, images, a display of scientific phenomena, trips and key speakers.

**Within a Planned Science Lesson:**

* A combination of teaching styles is adopted to suit the needs of all learners
* The needs of all learners are met effectively and support is precisely targeted
* Teachers and teaching assistants work with specific groups, and actively intervene and support with the learning of these particular children
* Key vocabulary, learning outcomes, success criteria are shared with the children at the outset
* Previous conceptual understanding is revisited to ensure a smooth transition into the new understanding
* Children are hands on, engaged in constant dialogue and play an active part in their learning
* Staff have the confidence to intervene through effective questioning to challenge or extend children’s thought processes

**Scientific Knowledge and Conceptual Understanding**

We deliver the curriculum through a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop a secure understanding of each key block of knowledge and concepts in order to progress competently to the next stage.

Pupils should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended scientific vocabulary. They should also apply their mathematical knowledge to their understanding of Science, including collecting, presenting and analysing data.

To support our key principles, the curriculum is delivered through:

* A principle of ‘dual objective planning’ where knowledge and skills sit hand in hand within teaching that ensures an appropriate and flexible challenge within the classroom, supporting The Science National Curriculum statement that “Working and thinking scientifically … must always be taught through the substantive science content”.
* Conceptual threads called ‘science models’ are taught within topics and provide a foundation for pupil descriptions and explanations, support scientific language development, develop ‘hands on’ learning and divergent thinking, engagement and a deeper understanding through a structured development of science ideas and concepts. These models allow for bridging between topics as models often thread through the science curriculum and concept recognition as pupils remember the model from previous topics and so gain immediate familiarity in new topics. as children progress through each year group, supporting a progressively deeper learning. There are four key science models in the primary curriculum (particle model, force arrow model, energy transfer model, big picture model).
* Five key science skills that support both knowledge / conceptual development and Working Scientifically to match pupil performance to national Key Stage expectations (explaining Science, classification, designing experiments, data, tables and graphs and making conclusions).
* The development of enquiry learning skills (see below).

**Enquiry Learning Skills:**

These skills include Creative Thinking, Information Processing, Enquiring, Reasoning and Evaluating (see below). They are also applied to other subjects across the curriculum.

**Creative thinking:** Generating ideas, developing ideas, hypothesising, applying imagination and seeking innovative alternatives

**Information Processing:** Finding relevant information, sorting/classifying/ sequencing information, comparing/contrasting, identifying

**Enquiry:** Asking questions, defining questions for enquiry, planning research, predicting outcomes, anticipating consequences and drawing conclusions.

**Reasoning:** Giving reasons for opinions/actions, inferring, making deductions, making informed judgments/decisions and using precise language to reason.

**Evaluation:** Developing evaluation criteria, applying evaluation criteria and judging the value of information and ideas.

**The Nature, Processes and Methods of Science**

‘Working Scientifically’ specifies the understanding of the nature, processes and methods of Science for each year group. It is not taught as a separate strand.

**Assessment**

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.

Teacher assessment is achieved through:

* discussion with pupils and their ability to answer closed and open-ended questions;
* observation of pupils engaged in an activity;
* marking ongoing written work using whole class feedback sheets, speech bubbles to discuss an aspect of a child’s work and Qs to consolidate or extend learning;
* Dialogue with members of support staff;
* Pre and post assessment activities.

**Tracking progress**

Pupil progress is tracked using teacher assessment against the five key science skills (explaining Science, classification, designing experiments, data, tables and graphs and making conclusions). This may be evident in pupils’ written work or through teacher observations within lessons. The teacher’s assessments are recorded digitally by the class teacher at three points throughout the year (December, March and July) and individual points progression is tracked by the subject leader to ensure that good progress is being made. The overall summative teacher assessment judgement given in July forms the baseline for target setting by the subject leader. A comment is made against national expectations and is reported to parents annually.

**Marking**

Teachers mark pupils’ work following the school marking policy (whole class feedback sheets) and feedback guidelines for Science. Pupils are given appropriate time to respond to misconceptions and errors.

**Resources**

* Science resources are stored in a central location.
* Staff share the responsibility of ensuring that resources are well kept and replenished.
* Individual class teachers are responsible for requesting specific resources for individual topics before the start of each term.

**Health and Safety**

* Emphasis is given at all times to safe working procedures for staff and pupils.
* A copy of the COSHH guidance ‘Be Safe’ is centrally located in the staffroom.

**Cross-Curricular Links**

Within Science, other curriculum skills are present including Maths (such as data, tables and graphs) and writing (such as basic grammar and punctuation is reinforced, spelling of scientific vocabulary, organising work using headings, explanation texts). Science is also present in other curriculum lessons. For example, some teachers might use novels with a Science genre and writing from this would then include reinforced scientific vocabulary and concepts, in PE teachers reinforce healthy living, in UKS2 children discuss the role of Science and God in the story of Creation, children may complete research linked to scientific concepts, scientists or inventors by using computing research skills, and natural phenomena may be a stimulus for Art and Design or Design and Technology.

**Academy Councillor**

There is a named governor linked to Science who plays a key role in monitoring and evaluating Science across the whole school through discussions and reports. The named academy councillors is currently Mrs Booth.

**Date**

November 2019