MUNTHAM HOUSE SCHOOL

SCIENCE POLICY

Science Policy

Science stimulates and encourages pupils' curiosity about phenomena and events in the world around them. It links ideas and knowledge with direct practical experience and can engage learners at many levels. Scientific methods develop and supports inquiry through experimentation and proposition. Knowledge and comprehension of the world that we live in allows students a greater understanding of the environment around them and encourages a sense of importance and belonging. Science develops creativity in thought and analysis in practice universally in our learners. As Science is a methodology to enquire and find out truths of the world around us it can inspire a love of learning that endures a lifetime.

Intent – Aims and Objectives

In Science we intend to:

- To engage pupils as learners at many levels through linking ideas with practical experience;
- To link pupils' understanding with scientific thought and thus develop a greater understanding of the world in which we live and their responsibility to ensure its sustainability
- To help pupils develop, model and evaluate experiments using critical and creative thought.
- To develop pupils' critical thinking and analytical skills.
- To develop pupils' understanding of how major scientific ideas contribute to technological development and advancement and how these impacts on improving the quality of our everyday lives.
- To provide a rich and varied science curriculum that will promote curiosity and interest in all pupils.
- To ensure teaching styles and methods in science vary to suit the type of learning and the pupils' differing learning styles and abilities.
- To provide appropriate and sufficient scientific resources for all pupils that will support effective learning and teaching.
- To develop a variety of other skills, including those of enquiry, problem solving, ICT, Maths, Literacy and different means of presentation using cross curricular links.

Implementation - Curriculum and content

Science is a core subject of the National Curriculum. In Science at Muntham, the National Curriculum is used as a framework, and then adapted to suit our pupils needs. The work covered at Key Stage 3 builds on the foundations that are set in the primary curriculum and covers content in a spiral model so that pupils are prepared and on a pathway that will allow them the best opportunity to succeed in their GCSE assessments. In KS3 we follow the AQA syllabus. This syllabus provides an alternative approach to KS3 content. Content is under 10 big idea headings: Forces, Electromagnetism, Energy, Waves, Matter, Reactions, Earth, Organisms, Ecosystems and Genes. Each idea contains four smaller topics: the building blocks for the big ideas.

This content is structured as a spiral to promote understanding. It's easier for students to develop an understanding of a big idea by multiple interactions with the concepts within the idea. By connecting smaller ideas to more abstract ideas, students will be better prepared to apply these concepts when approaching an unfamiliar topic. Each big idea topic contains four smaller topics that build in complexity. For example 'Waves', topics are ordered from simpler, more concrete topics 'Light' and 'Sound', to more abstract ones 'Wave properties' and

'Wave effects'. These have been created to avoid repetition, draw on various scientific skills and use different contexts.

In KS4 Pupils at Muntham are expected to achieve a combined GCSE award studying the AQA trilogy curriculum. Pupils will study the GCSE content in years 10 and 11, touching on a few of the key concepts in year 9. The content of lessons follows the specification for this course and pupils also complete the required practical activities in Biology, Chemistry and Physics so they are prepared for the six terminal examinations in year 11.

Lessons all have clear learning objectives, which are displayed and shared with the children as an embedded part of their learning. They are at all times aware of what they are going to learn through the activity, and what skills the teacher is looking for in their learning.

Teachers use a range of learning and teaching styles, incorporating individual, pair, class and group work into lessons. Children are taught through discussion, practical activity, games, investigations, problem solving, recording and practice, consolidation. Students also use Seneca as an online resource to supplement their learning, a resource that is used not just in Science but in Maths and Computing as well.. The teaching style and methods are varied according to the subject matter and the pupils being taught.

Pupils have frequent opportunities to develop their skills in planning investigative work, selecting relevant resources, making decisions about sources of information, carrying out activities safely and deciding the best form of communicating their findings. They are encouraged to take responsibility for their own learning as far as possible for their ages and abilities.

We recognize the fact that there are pupils of widely different abilities in all classes and we use a variety of methods to ensure suitable learning opportunities for all pupils, by matching the challenge of the task to the ability of the pupil. We achieve this by:

- Setting common, open-ended tasks which can have a variety of responses;
- Setting consecutive tasks of increasing difficulty, with children completing what they feel able to;
- Grouping pupils by ability and setting different tasks to each ability group;
- Providing resources that meet the needs of the group;
- Using learning assistants to support the work of individual pupils or groups of pupils;
- Giving additional teacher input to some pupils when needed

Implementation - Curriculum Maps

This is organised in three stages:

Long Term Planning (Curriculum Map)

This is based on the National Curriculum for science, which details what is to be taught over the Key Stages and provides the topic basis for planning science activities for each year group. This varies little from year to year, unless there are changes to the National Curriculum. It is monitored regularly and evaluated annually. The curriculum maps for science can be found in the science folder.

Medium Term Planning

This takes the long-term plan and organizes the teaching of science into termly or half-termly sections. The planning is more detailed and the objectives are more specific in

nature. Including assessment opportunities. This planning is developed by the class teachers, who respond to the needs of their pupils. It also ensures a balanced distribution of work is undertaken across each term.

Short Term Planning

Each half termly section is then split into individual phases, which then influence the individual planning of lessons. These are then tailored and adapted to the individual class, taking into account the individual needs of each student.

Impact - Monitoring and assessment

The science curriculum is monitored on a regular basis by the head of science and the science teachers, they examine pupils' work, monitors classroom practice and planning and ensures parity of entitlement for all pupils across the school.

Students in KS3 complete assessments at the end of every topic they have studied. These assessments vary in their delivery and can be extended practical write ups, literacy-based explanation tasks, topic tests or shorter answer recall quizzes. The assessments are formative in nature and are used in conjunction with all available evidence to make a judgement once a term against the pupils KS4 terminal target. Pupils are judged to be On, Above or below target. The main focus at KS3 is to provide next steps in learning so learners develop a growth mindset rather than just judging where they are in their learning at any given stage.

In KS4, pupils are assessed against the AQA GCSE criteria and assessment objectives of the course. Pupils are assessed at the end of each topic they study and given targets to improve. Once a term the science teacher takes all available evidence to make a statement if the pupil is On, Above or below their end of KS4 target. Highlighting any areas of underachievement and making early intervention possible.

For both KS3 and KS4, whether a student is currently working above, below or on target is then presented to Senior Leaders at the end of each term and this is then relayed to parents.

When assessing pupils work in science a variety of strategies, including questioning, discussion, concept mapping and marking, are used to assess progress. The information is used to identify the pupils' needs and to inform planning.

Through our curriculum, and the qualification they are able to achieve, we hope to permanently instill a culture of critical and analytical thinking about the world, to allow our students to take these skills into their everyday lives, as well as employment opportunities in the future. Whether or not our students choose to pursue Science as a career option, we hope to set them up with the toolkit they need to be successful in any area they choose.

Impact: Monitoring the Effectiveness of the Policy

Annually (or when the need arises) the effectiveness of this policy will be reviewed by the coordinator, the Headteacher and the nominated governor and the necessary recommendations for improvement will be made to the Governors.