Eleanor Smith School

Science Policy

This policy was agreed and signed by the Governing Body and Head Teacher:

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Approved by:	Chair of Governors and Head Teacher
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Introduction

This policy provides the rationale for the delivery of the Science curriculum to Key Stages 1, 2, 3 and 4 meeting both statutory requirements and the individual needs of the pupils within the school.

The policy forms part of the school's continuing development plan. The policy has been reviewed and updated by the Science Co-ordinators Lorraine Teeling and Sheila Obeng-Atakora. The policy was agreed by the staff of the school following a period of consultation.

In the study of Science, pupils should develop a lively interest and a positive attitude towards the subject, which should stimulate them to question, investigate, experiment and understand. They will be introduced to various aspects of Working Scientifically and topics under the three main themes of Biology, Chemistry and Physics, that will further their knowledge and understanding, of these areas. The focus will be on developing skills, which can be employed in a wide range of situations.

For pupils with social, emotional and behavioural difficulties, the experimental and investigative aspects of Science offer the opportunity for the development of social and learning skills which are useful in addressing their special educational needs. Therefore, a Child-Centred approach of teaching and learning is greatly utilised in the delivery of the Science curriculum. Pupils have the chance to undertake studies using a variety of methods and a wide range of resources and educational visits. Pupils also now have the opportunity to utilise these skills to gain Key Stage 4 qualifications in Science, to improve their future education and career prospects.

Aims of Policy

We aim:

To provide a broad, balanced and relevant curriculum related to the Programmes of Study within the National Curriculum.

To provide pupils with opportunities to develop scientific skills and knowledge and encourage pupils to appreciate the significance of Science in understanding the world around them.

To provide activities and resources within modules, which offer differentiation with regard to social, emotional and behavioural difficulties.

To provide pupils with opportunities to work independently and collaboratively.

To monitor, assess and record pupils' achievement and provide the opportunity for self-assessment, helping them to develop responsibility for their own learning.

To enable pupils to develop an awareness of health and safety issues when undertaking scientific investigations and experiments.

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Attitudes and competencies to be developed

In the teaching of Science at Eleanor Smith School, we consciously attempt to achieve the relevant objectives of new Curriculum 2014 and develop in pupils the following attitudes and competencies:

- Ability to use a wide variety of resources and equipment, safely
- A positive attitude and a lively interest in Science (attend and enjoy lessons)
- Ability to undertake scientific experiments and investigations
- Open-mindedness
- Objectivity
- Reflection
- Critical thinking
- Perseverance
- Independent learning skills
- Collaborative learning skills
- Healthy lifestyles
- Resilience

Key Learning Experiences Planned for the Pupils

Pupils at Key Stages 1 and 2 will be taught a range of topics as outlined in the National Curriculum 2014 and using the Rising Star Scheme of work.

Pupils at Key Stages 3 will be taught a range of topics as outlined in the National Curriculum 2014 and using the Smart Science Scheme of work.

The pupils will be taught the skills of Working Scientifically (SC1) within the context of Biology (SC 2), Chemistry (SC 3) and Physics (SC 4). This is in line with the National Curriculum changes in September 2014 and the subsequent amendments to the programme of study.

At KS4 Science is studied as a core subject following the Edexcel GCSE Science programme of study or Entry Level Functional Skills Science for those who are not able to access the GCSE curriculum.

This academic year, some higher ability Year 10 students have started the Edexcel GCSE Science Programme of Study in the spring term of Year 9. Scientific investigation skills as well as each of the scientific disciplines of Biology, Chemistry and Physics are taught throughout this programme of study. Entry level Functional Skills Science is taught to all students from Year 9-11 as a foundation for GCSE Science and to give all students an opportunity to achieve a qualification in Science.

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The Study of Science at Key Stage 1 and 2

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	**Who am I?**	**Celebrations**	**Polar Adventures**	**Treasure Island**	**On safari**	**Adventurers**
NC strand	Animals including humans	Materials	Materials	Materials	Animals including humans	Materials
Year 2	**Healthy me**	**Materials monster**	**Mini worlds**	**Move it**	**Young gardeners**	**Young master chef**
NC strand	Animals including humans	Uses of everyday materials	Uses of everyday materials	Uses of everyday materials	Plants	Animals including humans
Year 3	**Earth rocks**	**Food and our bodies**	**Mirror**	**How does your garden grow?**	**Opposites attract**	**We are astronauts**
NC strand	Rocks, soils and fossils	Animals including Humans Nutrition and skeletons	Lights	Plants	Forces and magnets	Space
Year 4	**What's that sound?**	**Living things**	**Looking at states**	**Teeth and eating**	**Power it up**	**Bubbles**
NC strand	Sound	Living things and their habitats.	States of matter	Animals including humans	Electricity	Working Scientifically
Year 5	**Out of this world**	**Material world**	**Circle of life**	**Let's get moving**	**Growing pains**	**We are super scientists**
NC strand	Earth and Space	Properties and changes of materials	Living things and their habitats	Forces	Animals including humans	Working scientifically
Year 6	**Classifying critters**	**Staying alive**	**We're evolving**	**Let it shine**	**Electrifying**	**We are dinosaur hunters**
NC strand	Living things and their habitat	Animals including humans	Evolution and inheritance	Light	Electricity	Evolution and inheritance

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The Study of Science at Key Stage 3

Science Key Stage 3

Aims

To develop **scientific knowledge** and **conceptual understanding** through the specific disciplines of **Biology, Chemistry and Physics.**

To develop understanding of the nature, processes and methods of science through different types of **science enquiries** that help to answer scientific questions about the world around us.

To be equipped with the scientific knowledge required to understand the **uses and implications of science, today and for the future**.

Pupils will be following the New National Curriculum for 2014 using the Smart Science programme of study.

Year 7

Working scientifically and Scientific Enquiry (SC1) is taught through the content across all three disciplines.

Term 1 - Cells and Organisation Biology of living systems. The structure and function of cells and living organisms.	**Term 2 – Particles** Chemistry of the properties and particulate nature of matter.
Term 3 – Forces and Motion Physics. Explaining the forces around us and describing the relationship between forces and motion. Speed, gravity and friction.	**Term 4 – Human Reproduction** Human Biology. The structure and function of the reproductive systems. Pregnancy and birth.
Term 5 – Acids and Alkalis Chemistry. The chemical reactions of acids and alkalis. Uses of acid and alkalis and the pH scale.	**Term 6 – Electricity** Physics. Static and current electricity. Electrical circuits and energy transfers.

Year 8

Working scientifically and Scientific Enquiry (SC1) is taught through the content across all three disciplines.

Term 1 **Nutrition and Digestion** Biology of diet and health. The human digestive system. Balanced diet and nutrition. **Gas Exchange Systems** Biology. Breathing, respiration and the effect of exercise on circulation and health.	**Term 2** **Chemical Reactions** Chemistry. Reactions of metals and reactivity. Chemical changes, combustion and oxidation. **Atoms and elements** Chemistry. Atoms, elements and compounds. Chemical reactions, chemical symbols and equations.
Term 3 **Light and Sound** Physics. Observing the properties of Light and Sound waves. Uses of light and sound waves.	**Term 4** **Photosynthesis** Plant Biology. Photosynthesis and gas exchange in plants. Plant reproduction.

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Term 3 **Electricity and Magnetism** Physics. Electrical relationships. Magnetic forces, the Earth's magnetism and electromagnets.	**Term 4** **Science week projects**
Term 5 **Earth, the atmosphere and environment** Chemistry. The Earth, rocks and the rock cycle. The atmosphere, recycling and human impact on the climate and environment.	**Term 6** **Levers, Moments and Pressure** Physics. Forces related to levers and pressure. Biomechanics, forces exerted on muscles. **STEM project**

Science Key Stage 4

Aims

Entry Level Science is a foundation for GCSE Science learning**,** sharing the same 6 unit areas; at a more accessible level. There are 6 exams Biology 1a and 1b, Chemistry 1a and 1b and Physics 1a and 1b.

A **GCSE qualification in Science** encourages students to be **inspired, motivated and challenged** by following a broad, coherent, practical, satisfying and worthwhile course of study.

It encourages students to develop their **curiosity about the living world** and provide insight into

and **experience of how science works**.

It enables students to engage with **Science in their everyday lives** and to make informed choices about further study in Science and related disciplines and **career choices**.

The Edexcel GCSE in Combined Science comprises of 6 units:

Biology Paper 1 and 2

Chemistry Paper 3 and 4

Physics Paper 5 and 6

Year 9

Data, evidence, theories and explanations, Practical and enquiry skills, Communication, Applications and implications of science runs throughout modules.

Term 1 Entry level B1a Biology Cells, genetics, inheritance and modifications	**Term 2 Entry level C1a Chemistry** Atoms, compounds and states of matter
Term 3 Entry level P1a Physics Forces, movement and energy	**Term 4 Entry level B1b Biology** Health, disease and the development of medicines
Term 5 Entry level C1b Chemistry Separating mixtures, breaking down substances, acids and metals	**Term 6 Entry level P1b Physics** Waves and radiation

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Year 10 (Year 11 2018/19) Data, evidence, theories and explanations, Practical and enquiry skills, Communication, Applications and implications of science runs throughout modules. Pupils undertake 8 core practical; these skills are examined in the linear examinations.	
Term 1 Biology B1a and B1b Revisit topics in preparation for entry level exams in November **GCSE Biology Paper 1 CB1 – CB4**	**Term 2 Biology B1b and Chemistry C1a** Revisit topics in preparation for entry level exams in November and February **GCSE Biology Paper 1 CB5 and Chemistry Paper 4 CC3 –CC7**
Term 3 Chemistry C1b Revisit topics in preparation for entry level exams in February **GCSE Chemistry Paper 3 CC1, CC2, CC8**	**Term 4 Physics P1a and P1b** Revisit topics in preparation for entry level exams in March/April **GCSE Physics Paper 5 CP1 – CP6**
Term 5 GCSE Physics Paper 5 CP1 – CP6 Motion, waves and radioactivity	**Term 6 GCSE Chemistry paper 3 CC9 – CC12** Chemical calculations and reactions

Year 11 From Sept 2019 Data, evidence, theories and explanations, Practical and enquiry skills, Communication, Applications and implications of science runs throughout modules. Pupils undertake 8 core practical; these skills are examined in the linear examinations.	
Term 1 GCSE Biology Paper 2 Plants, control systems and ecosystems	**Term 2 GCSE Chemistry Paper 3/4** Fuels, earth and atmosphere, periodic table
Term 3 GCSE Physics Paper 6 Electricity, magnetism and particle model	**Term 4 GCSE examination prep** Core practical, revision and examination skills.

Progression and Continuity

In Primary Science is taught to each group for one hour each week. The Science Scheme of Work at Eleanor Smith is organised around a half-termly modular structure. The modules are organised around themes based upon groupings of units from the Rising Star document. Modules progress pupils' understanding in stepped programmes. All the children within a Key Stage undertake the same key processes and skills. This arrangement ensures that continuity is maintained for pupils even where they are required to move between class groups.

Years 8 to 11 at Lawson close have 3 lessons (2hours 30mins) per week. We keep mainstream schools and alternative provisions aware of our current programmes of study through regular contacts with colleagues.

Science across the Curriculum

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The study of Science offers numerous opportunities for cross-curricular links to be made. We aim to introduce scientific skills and understandings into as many areas as possible, and introduce cross-curricular themes into the study of Science.

Subject Resources

The development and maintenance of subject resources is the responsibility of the Subject Co-ordinator, but in this responsibility the whole staff assists the Co-ordinator. Science equipment and resources are located in specified locations around the school. Staff are encouraged to approach the Science Co-ordinator for advice and information on resources, but are also encouraged to familiarise themselves with what is available. There is an expectation that after use, equipment is returned rapidly in order to maximise use.

The Science Co-ordinator will periodically arrange for resources to be checked and replenished where necessary. Within the review process, an evaluation and assessment is made of the current state of materials, and their appropriateness. Our aim is to ensure that materials are constantly updated. We augment our resources with practical workshops and visits to museums. A Subject Action Plan and a Stock List are maintained by the Science Co-ordinator at North Street and the Science Support Worker at Lawson Close.

Monitoring and Assessment

The Science Co-ordinators assess teachers' delivery of the Science curriculum through monitoring of plans, pupils' books and observations. The Science Co-ordinators will be observed and assessed by SAMs leader.

The Science Co-ordinators and individual class teachers undertake monitoring of pupils' progress in Science. Monitoring will operate at the individual, class and whole school level. Rising Star will be undertaken, assessed and monitored beginning and end of topic assessments at North Street site and at Lawson Close, the Smart Science assessments will be used. Evaluation of activities will focus upon the effectiveness of the learning experience offered, but also upon the progress of individual pupils.
At the end of every topic the children's progress will be assessed and recorded on the scheme of works recording sheets and transferred on to the whole school data using SIMs.

The summative assessments of pupils' progress at the end of the Autumn, Spring and Summer Terms will inform target setting, the writing of annual reports for parents and carers, and for the purpose of reporting at statutory reviews. At the end of each key stage, pupils are assessed via Teacher Assessment and National Tests, as appropriate.

At Key Stage 4 pupils undertake termly National Curriculum Assessments via

summative and teacher assessment. As part of the GCSE programme pupils undertake core practical assessments to assess Scientific Investigation skills and at the end of study complete six examinations two from each science discipline.

Equal Opportunities

An important consideration in Science will be Equal Opportunities. All pupils will be given an equal opportunity to participate, and achieve, in the scientific activities undertaken. In our selection of curriculum materials, we are careful to avoid stereotyping by, for example, gender or culture, and to offer resources that are free from gender or cultural bias. Through the provision of appropriate training our aspiration is to ensure that all staff provides good role modelling in the teaching of Science.

The Role of the Science Co-ordinator

The Science Co-ordinators are responsible for co-ordinating the planning and monitoring of the Science Curriculum within the context of the whole school curriculum, updating and taking into account new developments both at school, local and national level. The Subject Co-ordinator oversees the development of the half-termly modular plans and arranges for these to be periodically reviewed.

It is the role of the Co-ordinator to develop a collective understanding of what the aims and objectives are in delivering the Science curriculum. This is partially achieved by attending Borough Networking Meetings and feeding back to staff about changes proposed at the local or national level. It is the co-ordinator's responsibility to initiate and manage any proposed changes.

It is the responsibility of the Science Co-ordinator to develop a Subject Development Plan based on the children's learning needs and the School's Improvement Plan. It is also the responsibility of the co-ordinator to manage the subject's budget, and to purchase, organise and maintain equipment and materials.

Evaluation of the policy

Policies at Eleanor Smith School are subject to ongoing evaluation and annual review**.** The Co-ordinator seeks feedback from staff about general policy considerations, and reflects on the appropriateness of particular activities, modules and materials, making changes as deemed necessary. Where policy changes are needed following general feedback from inspectors and advisors, or national or local initiatives, this is likely to lead to a restatement of the Policy and the Subject Development Plan. These changes are then presented to the Senior Management Team and the whole staff.