Grange Primary School

Science Policy

1 Aims and objectives

1.1 Science teaches an understanding of natural phenomena. It aims to stimulate a child's excitement and curiosity in finding out why things happen in the way they do. It teaches methods of enquiry and investigation to stimulate creative thought. Children learn to ask scientific questions and understand how science can predict, explain and analyse observations made about their world. Throughout their learning, the children develop an appreciation of the past and current role of science in the world and the way in which science will affect the future on a personal, national, and global level.

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1.2 The aims of science are to enable children to:

- Be curious about the world around them and ask/answer scientific questions;
- Plan and carry out scientific investigations, using a range of types of enquiry;
- Know how to develop a fair test including all the different variables that need to be taken into account;
- Use equipment (including ICT) appropriately and correctly to answer a question;
- Evaluate evidence, and present their conclusions clearly and accurately;
- Know and understand the life processes of living things;
- Know and understand the physical processes of materials, electricity, light, sound, and natural forces;
- Know about the nature of the solar system, including the Earth;
- Increase awareness and inspiration for further study and careers in science;
- Use and apply their learning to understand the uses and implications of science, today and for the future.

2 Teaching and learning style

2.1 At Grange Primary School we use a variety of teaching and learning styles in science lessons, with the emphasis of developing the whole child through practical, enquiry based approach to the subject. Our principal aim is to advance children's curiosity and wonder about the world through developing their scientific skills, knowledge, and understanding. This is achieved through use of a range of teaching strategies, including whole-class teaching, cross-curricular learning, problem solving activities, small group enquiry-based activities as well as research activities, supporting all types of learning. We encourage the children to ask scientific questions and use a range of media to answer them independently. They use ICT in science lessons where it enhances their learning, including a variety of data, such as data loggers, visualisers, ipads, statistics, graphs, pictures, and photographs. Through our teaching we provide a wealth of opportunities for outdoor learning, reinforcing the role of Science in their world, which extends to visits to and investigations in the local and wider community.

2.2 We recognise that there are children of widely different scientific abilities in all classes and we ensure that we provide suitable learning opportunities for all children by matching the challenge and nature of the task to the ability of the child. We achieve this in a variety of ways by:

- Setting common tasks which are open-ended and can have a variety of responses;
- Setting tasks of increasing difficulty, which the children work through and challenge themselves to complete;
- Grouping children to suit the progression of each individual child e.g. ability groupings, mixed ability groupings, groupings based on other curriculum area strengths (numeracy, literacy, artistic, oracy), social groupings, optimal number of children in the group;
- Providing resources of different complexity and nature, matched to the ability of the child and nature of the task;
- Using adult support to ensure progression in the learning and work of all children (individual and focus groups).

- **2.3** At Grange Primary School we believe Science is an avenue through which the children can develop a range of skills from across the curriculum. To maximise the impact of this we have put science intervention schemes in place to support individual and vulnerable groups of children. We also use university workshops to provide intervention to children of all abilities in Science and extend their awareness of Science in the world and as a future career aspect.

- **2.4** Children's questioning and curiosity is a main principle of teaching and learning at Grange Primary School. In line with this, all classrooms have a question board/box where the children can write any questions they have about learning across the curriculum. Time is made within the curriculum to independently answer these questions, promoting higher order questioning and thinking.

- **2.5** Parental involvement is a key aspect of our ethos at Grange Primary School. Staff will set online homework once a half term, using a physics learning website. The activities require parents and carers to support their children in investigating Science in their World, using everyday equipment found around the home. Parents and children follow an investigation and share their findings on a blog on the Learning Platform before extending the investigation to further the children's learning.

3 Science curriculum planning

3.1 As of September 2014 there was a new curriculum for Science to be taught in Years 1, 3, 4 and 5. Years 2 and 6 will continue using the old National Curriculum until September 2015, when they will begin teaching the New National Curriculum. Nursery and Foundation stage children will be taught using the New Curriculum developed in 2012 and updated for implementation in September 2013. The school uses the Focus Education for science as the basis of its curriculum planning with emphasis on key knowledge and skills, use of scientific vocabulary and the development of scientific enquiry. We also use the KENT planning scheme to support our creative, investigative approach to Science teaching and learning.

3.2 We carry out our curriculum planning in science in three phases (long-term, medium-term and short-term). The long-term plan maps the scientific topics studied in each term during the year group, identified from the Focus Education guidance.

3.3 Our medium-term plans, which we have based on the Focus Education scheme of work in science, give details of each unit of work for each term. The science coordinator keeps and reviews these plans to ensure continuity and consistency in teaching and learning across the school. In this way we ensure complete coverage of the National Curriculum without repeating topics. We sometimes include Science as a "driver" subject, in line with our Focus Education approach or we identify how Science will be incorporated with the driver subject or question if it is not the driver for that half term.

3.4 The class teacher is responsible for writing their own daily lesson plans for each lesson, using the Foundation Stage Planning format (short-term plans). These plans list the specific learning objectives, activities to be completed and expected outcomes of each lesson. The class teacher keeps these individual plans, and during planning scrutiny monitoring, class exchanges and observations these may be discussed informally with the subject coordinator.

3.5 We have planned the topics in science so that they build on prior learning, make strong links with real world and challenge the children's scientific understanding and enquiry. We ensure that there are opportunities for children of all abilities to develop their skills and knowledge in each unit, and we also build progression into the science scheme of work, so that the children are increasingly challenged as they move up through the school.

4 The Foundation Stage

4.1 The EYFS science curriculum was developed during 2012 and updated for implementation in September 2013. We teach science in nursery and reception classes as an integral part of the topic work covered during the year, which incorporates or promotes the characteristics of learning skills. We work closely with the local school cluster to keep abreast of new initiatives that will support the early development of scientific skills, knowledge and understanding about the world. As the reception class is part of the Foundation Stage of the National Curriculum, we relate the scientific aspects of the children's work to the objectives set out in the Early Learning Goals (ELGs) which underpin the curriculum planning for children aged three to five. Science makes a significant contribution to developing a child's knowledge and understanding of the world, for example through investigating what floats and what sinks when placed in water.

5 The contribution of science to teaching in other curriculum areas

5.1 Literacy

Science contributes significantly to the teaching of Literacy in our school by actively promoting the skills of reading, writing, speaking and listening. The children develop oral skills in science lessons through discussions when working as part of a team, through recounting their observations of scientific experiments and through explaining their thinking when predicting or evaluating. They develop their writing skills through writing reports and projects and by recording information. The children also develop their vocabulary through the

increased use and understanding of scientific language, which is then extended to writing across the curriculum.

5.2 Numeracy

Science contributes to develop the teaching of numeracy in a number of ways. When the children use weights and measures, they are learning to use and apply number. Through working on investigations they learn to estimate and predict. They develop accuracy in their observation and recording of events, including accurate reading and interpretation of scales. Many of their answers and conclusions include use and understanding of numbers.

5.3 Information and communication technology (ICT)

Children use ICT in science lessons where appropriate. They use it to support their work in science by learning how to find, select and analyse information, on the Internet and on programs. Children use ICT to record, present and interpret data and then to review, modify and evaluate their work and improve its presentation. ICT used includes data loggers, cameras, ipads, easy speak microphones and visualisers to support observations.

5.4 Personal, social and health education (PSHE) and citizenship

Science makes a significant contribution to the teaching of PSHE and citizenship. This is mainly in two areas. Firstly, the subject matter lends itself to raising matters of citizenship and social welfare. For example, children study the way people recycle material and how environments are changed for better or worse. Secondly, the subject gives children numerous opportunities to debate and discuss. They can organise campaigns on matters of concern to them, such as helping the poor or homeless. Science thus promotes the concept of positive citizenship. Science is also used to promote understanding of how to look after yourself through our topics on healthy living.

5.5 Spiritual, moral, social and cultural development

Science teaching offers children many opportunities to examine some of the fundamental questions in life, for example, the evolution of living things and how the world was created in Year 6. Through many of the amazing processes that affect living things, children develop a sense of awe and wonder regarding the nature of our world. Science raises many social and moral questions. Through the teaching of science, children have the opportunity to discuss, for example, the effects of smoking, and the moral questions involved in this issue. We give them the chance to reflect on the way people care for the planet, and how science can contribute to the way we manage the earth's resources. The children also discuss the ethics of scientific testing as they progress through the school. Science teaches children about the reasons why people are different and, by developing the children's knowledge and understanding of physical and environmental factors, it promotes respect for other people.

6 Teaching science to children with special needs

We teach science to all children, whatever their ability. Science forms part of the school curriculum policy to provide a broad and balanced education for all children. We provide learning opportunities that are matched to the needs of children with learning difficulties. Our work in science takes into account the targets set in the children's Individual Education Plans (IEPs). Science intervention programs are also ran to provide time specifically to develop children's scientific investigation skills, which they can then apply back in their classroom to promote increased independence in subsequent learning.

7 Assessment, recording and target setting

7.1 With the introduction of the New Curriculum, Science is a core subject. Formal SATS assessment in KS2 is due to begin in July 2016, with a selection of sample schools chosen for July 2015.

7.2 Throughout the year we assess children's work in science by making formative judgements as we observe them during lessons. On completion of a piece of work, the teacher marks the work and comments as necessary, in line with our marking and feedback policy. At the end of a unit of work teachers complete the Science Assessment Trackers (from the Focus Education materials); they use the support sheets to assess children as "emerging", "exceeding" or working at an "expected" level for all given objectives for a topic. The tracker then translates these assessments into points on a six point scale. At the end of the year a final point score is calculated and attainment is assigned. This information is passed on to the next teacher at the end of the year.

8 Resources

A resource audit is conducted at the start of the academic year to ensure we have sufficient resources to support teaching of the new curriculum. This highlighted that we have sufficient resources for all science teaching topics in the school, which are kept these in a central Science Store in the Library. The nursery also have their own resources. There is equipment for each unit of work, clearly labelled, and a Resources Audit List has been given to all members of staff. The library contains a good supply of science topic books and computer software to support children's individual research. When using a resource, staff must sign it out and back in again on return. Resources are audited three times throughout the year and a "wish list" is emailed to staff three times a year for any specific resources required.

9 Monitoring and review

9.1 It is the responsibility of the science coordinator to monitor the standards of children's work and the quality of teaching and learning in science. The coordinator is also responsible for supporting colleagues in the teaching of science, for being informed about current developments in the subject, and for providing a strategic lead and direction for science in the school. The science coordinator gives the curriculum co-ordinator a termly review, which is shared with the governing body, and the headteacher an annual summary report in which s/he evaluates strengths and weaknesses in the subject, and indicates areas for further improvement. The coordinator has specially-allocated time for fulfilling vital monitoring tasks including, reviewing samples of children's work, pupil voice interviews, learning walks, planning scrutiny and visiting classes to observe teaching and learning in the subject. Class exchanges are also embarked upon throughout the year, where the science coordinator has the opportunity to set up partnerships in areas of strength/weakness to ensure support and high quality science teaching and learning across the school.

9.2 This policy will be reviewed every two years.

Signed: …… Date: ……..
Teacher/Coordinator