Glenmere Community Primary School
Science Curriculum Policy

1. Statement of Intent.

It is our intention to enable children to develop the intellectual and practical skills which will allow them to explore and investigate the world of science and develop a fuller understanding of science phenomena, the nature of the theories explaining these, and the procedures of scientific investigation. This should take place through activities that require a progressively more systematic and quantified approach which develops and draws upon an increased knowledge and understanding of science.

2. Aims.

We aim to provide children with activities which encourage them to ask questions, predict and hypothesise; to observe, measure and manipulate variables; to interpret their results and evaluate scientific evidence.

Throughout their study of science pupils should have the opportunity to develop and use communication skills and techniques such as reporting their work to a variety of audiences.

Pupils will be encouraged to present information in an ordered manner through drawings ,writing, diagrams, tables, charts, and graphs; and use books, charts and other sources from which they can gain information.

Pupils will be given the opportunity to use computers to store, retrieve and present their work.

Opportunities will also be provided for pupils to develop an awareness of the importance of science in everyday life including its' relationship to personal health and safety. This may be provided through investigations, secondary sources of information or visits.

Pupils will be encouraged to consider domestic and environmental contexts as starting points for their work in science.

3. Knowledge, skills and Understanding

Foundation Stage (see Early Learning Goals- Understanding the world).

Understanding of the world (foundation stage):

Pupils should be given opportunities to develop effectively their knowledge and understanding of the world based upon first-hand experiences, observations, problem solving activities, critical thinking, decision making and discussion. They should be provided with a stimulating environment to develop their interest and curiosity to allow exploration and a questioning approach to activities including active learning.

These activities should:

- allow pupils to learn to use a range of tools such as computers and magnifiers.
- allow pupils to encounter creatures, plants and objects in their natural environment.
- provide opportunities to learn by doing new and interesting things.
- allow the pupils to work with a range of materials such as wet and dry sand.
- provide opportunities to gather information to satisfy their curiosity.
- be given open ended questions to develop their own understanding further.
- Be given real experiences.

Key Stage 1 and 2 Programmes of study

(see Key Stages 1 and 2 of the National Curriculum 2000 pages 78 and 83.)

1. Systematic enquiry
2. Science in everyday life
3. The nature of scientific ideas
4. Communication
5. Health and safety

SC1 Scientific enquiry
Key stage 1

Pupils should be encouraged to develop investigative skills and understanding of science in the context of explorations and investigations largely of the 'Do...',Describe which...'and 'Find a way to...'type, involving problems with obvious key variables which are within their everyday experience.

These activities should:

- encourage pupils to use and develop their scientific knowledge and understanding;
- involve pupils and their teachers in promoting ideas and seeking solutions;
- promote at first hand the exploration of materials(living and non-living)and events;
- encourage the need for safe and careful action;
- encourage the sorting, grouping and describing of materials and their events in their immediate environment, using their senses and noting similarities and differences;
- encourage the use of non-standard measures, for example, hand spans, and the use of standard measures;
- introduce the idea of a fair test;
- develop an understanding of the purpose of recording results and so encourage systematic recording, using appropriate methods, including block graphs and frequency charts;
- encourage the interpretation of results;
- encourage pupils to question what they have done and suggest improvements.

Key stage 2

Pupils should be encouraged to develop investigative skills and understanding of science through activities which:

- help them to use and develop scientific knowledge and understanding;
- encourage the raising and answering of questions;
- foster understanding and practice of safety and care;
- are within their everyday experience and provide opportunities to explore;
- build upon existing practical skills;
- require an increasingly systematic approach involving the identification and manipulation of key variables;
- involve the use of secondary sources as well as first-hand observations;
- include the use of computers and simple electronic devices in their experimental work;
- involve variables to be controlled in the development of

'fair tests';

- encourage the formulation of testable hypotheses, drawing on their developing knowledge and understanding;
- develop skills of using equipment and measurement, encouraging them to make decisions about when, what and how to measure;
- encourage systematic listing and recording of data, for example, in frequency tables;
- promote the search for patterns in data;
- foster the interpretation of data and evaluation;
- involve the capture, transmission, storage & retrieval of information using computers;
- encourage pupils to appraise their investigations and suggest improvements to their methods.

4.Schemes of Work.

Schemes of work are planned through a context for learning and the coverage of key scientific skills. The key skills encourage continuity and progression across and between key stages and are intended to provide a balance of activities which engage children in a range of scientific processes. Planning is an on-going process taking into accounts the needs and requirements of the children within the year group and individual classes. This allows children to achieve levels appropriate to their age and ability. Also, expertise can be built-up and shared amongst teachers thereby maximising the strengths and time commitment of the staff and to target resources effectively. Planning and assessment is done in year groups based upon the key skills and science National Curriculum requirements. The schemes of work are continually reviewed and updated.

At the present time foundation stage children follow a yearly rolling programme based upon the DfEE Foundation Stage Early Learning Goals and National Curriculum requirements. Key Stage 1 & 2 planning across the school will have cross-curricular links whenever possible with other National curriculum subjects as well as close links with the use of the outside environment.

Each child should experience a science education that has:

- Cross-curricular links. When appropriate science should be linked to other areas of the curriculum.

- Relevance. Science needs to be placed within a context to assist understanding. The younger the child the more important it is that the material should be based around, and draw from, everyday experiences. The older the children the wider their experiences and more complex their conceptual understanding. Contextualising the material is always important as it provides meaning and purpose to the activities.

- Breadth and balance. A balance of activities should be provided for children which engage them in observation, reflection, prediction, practical exploration, recording and evaluation. There should also be a balance of assessment opportunities provided by the teacher.

- Continuity and progression. If children are to learn in a coherent and efficient manner the learning programme needs continuity and progression. The subject leader is responsible for checking that this occurs in the curriculum planning at both key stages.

SEN and G&T

In order for children to fulfil their maximum potential each child needs to be provided with work that is tailored to his or her specific needs, and which keeps pace with their developing abilities. There are a number of ways that this can be approached but no one method is sufficient in itself. Effective teaching demands the use of as much variety as possible to encourage achievement. Some strategies include:

1) The provision of a variety of tasks related to a common theme within the study unit. Lower-attaining children could be provided with more practical and concrete experiences, initially set into context by way of a preliminary discussion. Higher-attaining children can be provided with more demanding activities and extension work ('differentiation by task').

2) Providing work which allows individuals to learn at their own rate and within their own level of capability ('differentiation by outcome').

3) Setting a task for all the members in the class. Provide extra support for lower-attaining children and more responsibility and challenge to the more able ('differentiation by outcome').

4) Encouraging the children to plan and implement practical work co-operatively within mixed ability groups. Recording and reporting-back should involve individuals at an appropriate level ('differentiation by outcome').

In order to provide work that is differentiated it is important to ensure that the curriculum will:
a) Build on pupils' past achievements.
b) Remove barriers that may prevent participation.
c) Provide opportunities for success.
d) Present pupils with challenges that will allow for more achievement.

- Equal opportunities. Effective science work and planning should provide equal opportunities for boys and girls and any children with special education needs. There is a need to ensure that all children receive equal access to the science curriculum.

5. Teaching and Learning Strategies.

A variety of teaching methods can be applied to the science curriculum. Some activities may lend themselves to whole class activities whilst others would be more beneficial if carried out by small groups.

Methodology is very important in science. It is necessary to identify and understand the processes involved in scientific
exploration.

(1) Children should observe the world around them.

(2) Children's observations should enable them to raise questions make predictions and to hypothesise.

(3) Children should plan investigations to answer the initial enquiry and test the hypothesis.

(4) Carry out the investigation and collect the data.

(5) Interpret the data and analyse the results.

(6) Draw inferences and conclusions.

(7) Evaluate whether the investigation answered the initial enquiry. If not return to (3).

(8) Address further questions that might be raised by the investigation.

When working scientifically it is essential that the following positive attitudes are fostered:

- Open-mindedness
- Perseverance
- Tolerance
- Curiosity
- Respect for peers
- Respect for evidence
-Awareness of effects of -Humanity on environments
- Co-operation
- Originality
- Personal satisfaction
- Critical awareness
- Confidence
- Respect for living things
- Responsibility for the environment

Central to any scientific teaching should be enjoyment. Science should be fun! If the children enjoy science then they will want to continue to learn about the subject.

Safety Check

Science poses a number of potential dangers in the classroom due to its practical nature. It must be stressed that these dangers are minimal if proper precautions are taken. The most important factor is the children's own awareness and attitudes to working
in the classroom. They should be aware of any rules that are in place and the reasons for them. Children should be aware of the consequences of ignoring safety rules.
Below are some safety points that should be considered and should be used in conjunction with any regulations circulated by the local authority. The important thing is to ensure that the degree of teacher supervision is appropriate to the situation.

- Only use glassware as a last resort. Use plastic alternatives if possible, such as plastic mirrors and beakers

- Use spirit thermometers or crystal strips for temperature readings.

- Heating things should be done under close teacher supervision. Long hair and loose garments should be tied back and it may be necessary to wear eye protection.

- Use only a candle, nightlight, hair dryer, hot water or school stove as a heat source. Candles and night lights should be embedded in a sand tray. Keep a bucket of dry sand nearby in case of emergency.

- Do not use any substance which may be hazardous! If in doubt about using any substance refer to the Head teacher and the schools Health & Safety policy, also the ASE Be safe booklet stored in the science resources cupboard provides appropriate information.

- Careful consideration should be paid to keeping animals in school. Only consider animals that are suitable for the classroom. Never keep animals that are venomous, because allergic reactions transmit diseases or are scarce or generally difficult to keep in captivity. Always refer to the Head teacher.

- Animal cages should be disinfected regularly and children should always wash their hands before and after handling animals. Medical advice should be sought if any bites or scratches result from handling animals.

- Teach the children to handle the animals properly, carefully and
with respect. Animals should always be fed correctly and appropriate arrangements should be made for holidays.

- Plants need to be carefully chosen for the classroom. Some have poisonous parts or can cause allergies and asthma. Children should never taste parts of plants, such as berries or leaves, unless expressly allowed (such as cress).

- Never look directly at bright light sources, such as the sun or a projector beam. Dark glasses or plastic do not offer sufficient protection for such activity.

- Children should never use mains electricity. They should be regularly warned about the dangers of using mains electricity. Use dry batteries or low voltage power supplies whenever possible. Never cut open batteries and always dispose of old batteries in case of leakage.

- Magnets can cause damage to equipment such as watches, televisions, computers and tape recorders. Always store them away from such pieces of equipment.

- Children should never carry heavy loads.

- When tasting food obtain written permission from parents, always ensure that it has been thoroughly cleaned beforehand. Staffs need to be aware of any children with food allergies and take this into account when planning activities involving food. All utensils and work surfaces should also be thoroughly cleaned.

- Teach children to use tools correctly. Provide adequate work space but do not allow children to wander around the classroom with tools in their hands.

6 Assessments, Recording & Reporting Pupil Progress

Both formative and summative assessments assessing children's work will be carried out throughout the area of study in order to assess pupils progress. Some of these assessments may be moderated within year groups, and key stage groups so that they are standardised within the school. Appropriate records will be kept by each class teacher and a National Curriculum level will be recorded for each child at the end of each school year.

Samples of work are viewed from children of differing abilities in each year group to support teachers and the subject leader in assessing children's work. So that appropriate judgements can be made about standards and progression within the school.

Parents are invited to attend termly Parents' Evenings where there will be an opportunity for parents to discuss their child's progress. At the end of each academic year parents will receive a formal written report on their child's progress. Parents will also be given opportunities to see the work their child has been doing. Reporting to the next class teacher occurs at the end of each academic year by means of the school computerised science record forms and discussions between staff.

7. Managing Resources

The science subject leader has overall responsibility for the science resources available in school and manages a budget, for this ordering stock as appropriate. The science resources fall into five basic categories, identified below.

Category 1.Printed Material

Books for children
Teachers' resources books
Posters

Category 2.One-off purchases

Equipment required providing an effective, well-resourced science scheme. Examples: magnifiers, magnets, thermometers, plastic mirrors, binocular microscopes, scales. Equipment should be added every year in order to replace breakages, accommodate innovations and broaden the available facilities.

Category 3.Computer programmes

Particular programmes available in school relevant to the science curriculum. Computer programmes will need to be reviewed and up-dated as computer technology progresses and new programmes are developed.

Category 4.Consumable equipment

Equipment that will need to be replaced each year or during the year. Examples include batteries, bulbs, filter paper and potting compost.

Category 5.Everyday materials

Various materials can be collected together to help with the teaching of science.
Examples include plastic film pots, flower pots and plastic cartons.

The science resources are stored in the following areas of the school:

Central resource area:-
One-off equipment, consumable equipment and everyday materials.

Staffroom:-
Printed materials

Classrooms and Computer suite:-

Computer programmes.

Storage chest:-
Posters

Detailed lists of resources for science can be found in the science policy folder or can be obtained from the science subject leader.

8. Evaluations and Review.

Minor changes may need to be made to this policy after some time.
A regular review of the policy will ensure that the policy addresses the changing demands of the school and any changes in legislation. The structure of the document should allow any such modifications to be made relatively easily. We need to review the policy on a regular basis to ensure that it is kept up to date.

Updated November 2018

Date for Review: November 2019