Garnteg Primary School

Science & Technology Policy

Ratified by Garnteg GB.................K Gauntlett.......................................

Date...................24.05.17...

Review date …… …May 2019………………….

Reviewed..

Next review date....................................

SCIENCE AND TECHNOLOGY POLICY FOR GARNTEG PRIMARY SCHOOL

The policy is a statement of the aims, principles and strategies for learning and teaching of science and technology in Garnteg Primary School.

It was developed through a process of consultation between the science, D&T, and ICT co-ordinators, teaching staff and governors. The policy has been approved by the governing body, and it will next be reviewed in 2020.

The schedule for review of this and all other policy documents is set out in the school's five year plan for whole school development.

School Philosophy of Science and Technology

Science and technology is about children developing an enquiring mind through exploring and creating resources and models to support their kinaesthetic learning throughout their topics. They can extend their knowledge and understanding of the world using a range of ICT to support and present this. Children should, therefore, be given the opportunity to investigate the world around them in a safe and systematic way, making use of their increasing knowledge and skills to describe, interpret and evaluate their findings, as well as using a range of materials and resources to create what they need.

Aims for Science and Technology

- This area of learning and Experience capitalises on children and young people's curiosity about our natural, physical world and universe through investigating, understanding and explaining.
- They learn to generate and test ideas, gather evidence, make observations, carry out practical investigations, and communicate with others.
- They learn how through computer science the horizons of what is possible can be extended beyond our current imagination.
- Learn how technology is used to design products that improve the quality of human life and to apply their scientific and other knowledge to practical purposes and challenges.
- As a school we will be providing children and young people with rich opportunities to develop technological skills, knowledge, understanding and attributes through designing and developing products and systems.
- Children will be able to explore the impact of technology on society and the environment

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- Learning in the Science and Technology Are of Learning and Experience will enable many young people to prepare for careers in Science, digital industries, and technology.

Science in the National Curriculum

The study areas in science as set out in the National Curriculum 2008, is divided into three units namely:

1 Independence of organisms
2 The Sustainable Earth
3 How things work

Equal Opportunities and Special Needs

Every effort is made to ensure that scientific activities and investigations and subsequent assessments are designed to allow full access for all pupils, irrespective of gender or ethnicity.

Although the programme of study for each key stage is taught to the great majority of pupils in the key stage, in way appropriate to their abilities, for the small number of pupils who may need the provision, materials is selected from earlier or later key stages to enable individual pupils to progress and demonstrate achievement. Such material is presented in contexts suitable to the pupil's age. Appropriate provision is made for pupils with physical and sensory difficulties using appropriate methods.

Pupils with particular ability and flair for science who work more quickly through the levels of the National Curriculum are extended through the use of supplementary work cards and computer software.

Differentiation

In order to provide for children of different abilities within each class, we endeavour to differentiate tasks in a suitable way:

Questioning: by level of questioning appropriate to ability;

Recording: using a variety of methods according to the differing abilities of the children. Refer to teaching strategies;

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Text: pupils dealing with same topic but stimulus material at different
levels of difficulty;

Support: varying levels of support by teaching;

Interest: individual pupils are allowed to pursue something which is of
Interest to them. (Choice is skill/topic etc);

Task: same text but a variety of tasks set, eg:

                Group 1:   answer questions
                Group 2:   writes commentary

Organisation: organising materials in classroom to allow for many of the above
approaches (different skills learned/group work).

Teaching Strategies and Planning

It is important that the teacher identifies the most appropriate teaching strategy to suit the purpose of a particular learning situation.

There are a variety of ways in which the teaching may be effective and our school tends to encourage learning through investigation or enquiry, with an emphasis placed on firsthand experience, although it is also acceptable to use demonstration, research, exploration and teacher-led investigations when circumstances, resources and the needs of individuals and groups allow.

Teachers are encouraged to use their flair, enthusiasm, and professional judgement to identify the most sensible, enjoyable and safe methods for the work being conducted. The scheme of work outlines teaching and learning objectives and a range suitable activities from which individual teachers may appropriately select.

We are aiming to try to access what knowledge children bring with them in science, and to provide them with experiences that will help them to develop their level of knowledge and understanding of scientific concepts. The quality of questioning and talk is a central feature of the delivery of science within the school.

Children are encouraged to work as individuals, in pairs, in three's, in groups and also as a whole class.
Activities will be planned in such a way as to encourage full and active participation by all children irrespective of ability.

Science is planned through long, medium and short term planning is an overview of coverage for the key stage. Medium term planning (scheme of work) plans for learning outcomes, activities, assessment, development of key skills and cross curricular issues, the development of scientific learning outcomes, differentiation, assessment strategies, and evaluation of work carried out.

Science and technology is delivered through
- a two year cycle
- a skills based topic approach

The Role for the Science and Technology Team is to:

Take the lead in policy development and help in the production of schemes of work designed to ensure progression and continuity in science and technology throughout the school; support colleagues in their development of detailed work plans, their implementation of the scheme of work and in assessment and record keeping activities, monitor progress in science and technology and advise the head teacher on action needed; take responsibility for the purpose and organisation of central resources for science and technology and stimulating their use; keep up-to-date with developments in science and technology education and disseminate information t colleagues as appropriate.
The responsibility of the Curriculum Team will encompass liaison with other key stages of education, organising appropriate links arranging exchange of information relating to transfer.

Assessment, Recording and Reporting

(See whole school policy)

Strategies for the use of Resources

There is a central resource area to which each teacher has access. The pupils are encouraged to choose from a range of equipment when carrying out investigations. Pupils are trained in the safe and considerate use of animals, plants and equipment and to be neat and tidy workers. The Science and technology team are responsible for the Area of Learning resources.

Developing Wider Skills and Literacy and numeracy framework please see appendix A for details of the new curriculum in Wales and how Science and Technology will be integrated into these areas
Safety and Care please see rick assessment appendix B

The safe use of equipment is promoted at all times.

Children's Safety in Science and Technology

Teachers engaging in science activities should take more of the safety advice below:

- avoid using glass apparatus apart from optical instruments;
- warn children of the dangers of mains electricity when dealing with topic electricity or using electrical equipment;
- choose household chemicals with care. Avoid any thing strongly caustic or containing bleach;
- discourage random sniffing or tasting
- observe simple hygiene rules;
- take care when using any sort of heat or lighted candles. Never let children handle matches. Candles must be firmly fixed and children's long hair tied back;
- don't handle unknown or unfamiliar plants – especially fungi;
- tidy work tables and avoid clutter;
- put tops on bottles (especially those containing liquids) immediately after use;
- have sand (in case of fire), water, paper towels and first aid materials to hand
   minimise classroom movement, ensure liquid spillage is
   as part of lesson planning anticipate hazards and take precautionary
   measures.

Children's Safety in Design and Technology

Teachers engaging in design and technology activities should take more of the safety advice below:

- Keep close supervision at all times when using tools and other equipment

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- Make sure equipment is safely stored and carried appropriately
- Children are not to carry sharp or heavy tools unsupervised
- Children should not use or clean sharp cutlery unsupervised when cooking
- Children should use tools and equipment in small groups so they are constantly supervised
- When cooking staff should be mindful of allergies (see care plans in staff room)

Children's Safety in ICT

Teachers engaging in ICT activities should take more of the safety advice below:

- see E-safety policy
- ICT equipment should be stored appropriately, turned off or charged after use
- Pupils should be supervised at all times when using ICT equipment
- Problems with ICT should be logged according to school policy (i.e. Log a call with SRS using ServicePoint)

EQUAL OPPORTUNITIES

Garnteg Primary School is committed to equality, including racial equality, for all members of the school community. The school promotes a positive and proactive approach to valuing and respecting diversity, and will not tolerate racial harassment of any kind.

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Appendix A

Developing Wider Skills and Literacy and numeracy framework

All learners should be given opportunities to build on skills they have already acquired. Learners should continue to acquire, develop, practise, apply and refine these skills through group and individual tasks in a variety of contexts across the curriculum. These skills include;

Critical thinking and problem solving – marshalling critical and logical processes to analyse and understand situations and develop responses and solutions.

Planning and Organising – implementing solutions and executing ideas and monitoring and reflecting on results.

Creativity and Innovation – generating ideas, openness and courage to explore ideas and express opinions.

Personal Effectiveness – reflecting on and understanding oneself and others, behaving in effective and appropriate ways; being an effective learner.

At Garnteg Primary School we fully endorse and have integrated the LNF into all our curriculum policies and Schemes of work. Within the foundation subjects of Humanities, Geography and Art, Design Technology, Physical Educational, ESDGC, Music the following skills have been mapped into both the long term and short term planning to produce a comprehensive continuum for pupils learning.

The LNF focuses on the learners' acquisition of, and ability to apply, the skills and concepts they have learned to complete tasks appropriate for their stage of development. Expectations are given for each school year from Reception to Year 6 in each of the elements and aspects. The LNF is designed to be inclusive of all learners, including those with additional learning needs (ALN). The Routes to literacy and Routes to numeracy components of the LNF describe progression into Foundation Phase for learners with ALN. Extension expectations are also given for those learners with higher-order literacy and/or numeracy skills, such as more able and talented (MAT) learners. The two components of the LNF are divided into the following strands. Within literacy the strands are:

• oracy across the curriculum

• reading across the curriculum

• writing across the curriculum.

Within **numeracy** the strands are:

• developing numerical reasoning

• using number skills

• using measuring skills

• using data skills.

 The teaching of these language skills should always be integrated so that each supports the others. Numeracy in the LNF is described as consisting of four strands. However, developing numerical reasoning underpins the three procedural strands of using number skills, Using measuring skills, Using data skills. It is vital that numeracy is not viewed as four discrete strands, which are developed in isolation from each other.
 Progression through the stages is demonstrated by an ability to develop and demonstrate increasing competence in literacy and numeracy skills. The expectations are essentially concerned with developing and recognising a learner's ability to select and apply literacy and numeracy skills in ways that are appropriate to each context. The expectations are designed to recognise learners' abilities to select and apply numeracy and literacy skills in ways that are appropriate to each context.

Developing Digital Competency

Digital competence is one of 3 cross-curricular responsibilities, alongside literacy and numeracy. It focuses on developing digital skills which can be applied to a wide range of subjects and scenarios which will be integrated into our Science and Technology Curriculum.

Curriculum Cymraeg

Science and technology contributes to the Curriculum Cymraeg by the use of contexts that are relevant to learners' lives in Wales. The rich and varied environment around learners gives the basis for fieldwork. Learners have the opportunity to study recycling, sustainability and the impact of humans within their locality and further afield.

Personal and social education and the Four Purposes

Science and technology contributes to learners' personal and social education by helping them to make sense of issues within their lives and others' lives. It gives background evidence to health and well-being, sex and relationships, recycling and the sustainability of both materials and energy. With increasing maturity learners compare their lives with that in developing countries and review the impact of humans on the Earth.
Science and technology links to Four Purposes of the curriculum

HAZARDS	WHO COULD BE HARMED AND HOW?	WHAT ARE YOU DOING ALREADY?	WHAT FURTHER ACTION IS NECESSARY?	BY WHOM	BY WHEN	COMPLETED (DATE)
Faulty equipment	Children and staff	Check equipment before each session to ensure it can be used. Science team carry out an audit once a year to check all equipment, ordering more or throwing away any unsafe equipment when necessary.	Ensure that all staff are checking the equipment before they use any of it.	All staff.	Ongoing.	
Boiling water	Children and staff	Ensure that pupils are made aware of the dangers of working with boiling water and ensure that pupils take temperatures of water with care. Adult supervision to occur throughout.	Share with pupils safety symbols for experiments. Ensure adult supervision continues.	All staff.	Ongoing.	
Chemical substances	Children and staff	Wear eye protection (goggles) when working with any chemical substances.	Check suitability of goggles, ensure they are fit for purpose and order more goggles. Ensure pupils are aware of reasons for wearing goggles.	All staff.	Ongoing.	
		Checking areas in which the children and are working in are safe and clear	Check areas are clear	All staff.	Ongoing.	

Workspace	Children and staff	from unnecessary objects e.g. bags and coats are in cloakrooms. Unnecessary stationary, books and other objects to be cleared away before experiment commences.	prior to experiments and ensure risk assessment of areas is carried out before an experiment takes place.			
Food and drink	Children and staff	Ensure that no food or drink is present in experiment areas. Any spills from drinks or other liquids to be cleared away as soon as possible. Ensure no children or staff are allergic to any of the ingredients	Ensure that all staff are checking food and drink are not present in experiment areas before they use any of it.	All staff.	Ongoing.	
Iron filings	Children and staff	Instruct pupils to wear safety goggles when working with iron filings. Instruct staff and pupils not to open the transparent boxes, as iron filings are hazardous to the eyes.	Check suitability of goggles, ensure they are fit for purpose and order more goggles.	All staff.	Ongoing.	

			Ensure pupils are aware of reasons for wearing goggles.			
Experiments in the outdoors	Children and staff	Check areas for mole hills and digging them out, filling holes with earth. Check pupils have suitable footwear to go into outdoor areas. Liaise with grounds staff to ensure areas are safe and suitable for purpose. Ensure pupils are aware of the safety procedures and rules when in areas such as the pond and secret garden.	Ensure that all staff check areas prior to use. Upkeep of the outdoor areas.	All staff.	Ongoing.	
Dangerous equipment	Children and staff	Children must be supervised at all times when using saws, drills or other power tools. Tools must be checked for safety purposes beforehand. Children and staff should wear and use Appropriate safety equipment e.g. safety goggles and sawing block.	Ensure all staff are trained on tools and are wearing the correct safety equipment.	All staff	Ongoing.	
		Children must be supervised at all	Ensure staff	All staff	Ongoing.	

| Esafety – using appropriate content. | Children and staff | times when using the internet to ensure that children are watching/visiting sites that are appropriate for their age.

See Esafety policy for more information. | are monitoring children at all times. | | | |
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Appendix B – Risk Assessment Form

HEALTH AND SAFETY RISK ASSESSMENT FORM	
RISK ASSESSMENT FOR: Science	**ASSESSMENT UNDERTAKEN BY: Miss S Jones**
DATE OF ASSESSMENT: 08.05.17	**REVIEW DATE:**

Please use this for to assess generic or specific tasks, work activities or equipment. The person undertaking the assessment must be competent to do so.

APPENDIX 2 - Risk Matrix

Likelihood

Taking into account the controls in place and their adequacy, how likely is it that such an incident could occur? Apply a score according to the following scale:

Level	Descriptor	Description
5	Almost Certain	Likely to occur on many occasions, a persistent issue (will occur on a daily basis).
4	Likely	Will probably occur but it is not a persistent issue (will occur on a monthly basis).
3	Possible	May occur occasionally (possibly on an annual basis).
2	Unlikely	Do not expect it to happen but it is possible (unlikely to occur over a shorter time scale 1-2 years, possibly over longer time scales).
1	Rare	Doubtful if it will ever occur (unlikely to occur even over a longer time scale).

Severity

Taking into account the controls in place and their adequacy, how severe would the consequences be of such an incident? Apply a score according to the following scale.

Level	Descriptor	Actual or Potential Impact on Individual(s)	Actual or Potential Impact on Authority
5	Catastrophic	Death or Permanent damage	HSE Investigation Litigation expected/certain
4	Major	Permanent injury or illness e.g. RIDDOR reportable injury/ill health retirement/redeployment	RIDDOR reportable Long term sickness Litigation expected/certain
3	Moderate	Semi permanent injury/damage or illness e.g. injury that takes up to 6-12 months to resolve or requires Occupational Health involvement/rehabilitation	RIDDOR reportable, Long term sickness, Litigation possible but not certain, High potential for complaint
2	Minor	Short-term injury/damage or illness e.g. injury or illness that has been resolved within one	Minimal risk to the Council, Short term sickness, Litigation unlikely,

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		month	Complaint possible
1	Insignificant	No injury or adverse outcome	No risk to the Council, Unlikely to cause complaint, Litigation risk remote

Risk Score/Action to be taken

LIKELIHOOD	SEVERITY					ACTION
	1 Insignificant	2 Minor	3 Moderate	4 Major	5 Catastrophic	
1 – Rare	1	2	3	4	5	No immediate
2 – Unlikely	2	4	6	8	10	Action within 3-6 months
3 – Possible	3	6	9	12	15	Urgent action
4 – Likely	4	8	12	16	20	
5 – Almost Certain		10	15	20	25	