**AoLE Science and Technology Policy**

**2023/2024**

Date of Review: 23 November 2023 Signature: A J Williams

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| Approved by Governors: |  |  |  |
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*The new National Curriculum in Wales will have 4 Broad Purposes, 6 Areas of Learning and Experience and 3 Cross Curriculum Responsibilities. This Policy indicates how the school is preparing for the new curriculum under the existing statutory National Curriculum Requirements for Wales (September 2014).*

The United Nations Convention on the Rights of the Child (CRC) is at the heart of our school’s planning, policies, practice and ethos. As a rights-respecting school we not only teach about children’s rights but also model rights and respect in all relationships – Linked to Articles 3, 7, 16 (CRC)

**SUCCESSFUL FUTURES**

Independent Review of Curriculum and Assessment Arrangements in Wales

Professor Graham Donaldson (February 2015)

The New Curriculum in Wales will be planned to achieve 4 Broad Purposes:

That children and young people develop as:

* Ambitious capable learners
* Enterprising creative contributors
* Ethical informed citizens
* Healthy confident individuals

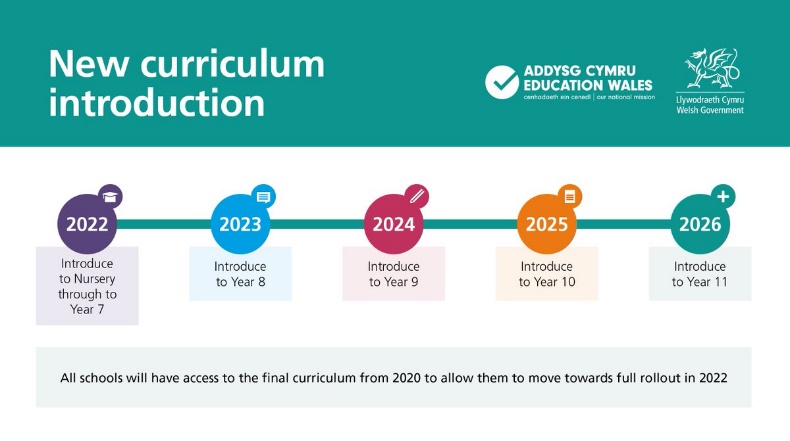
The Curriculum will be organized into 6 areas of learning and experience:

* Expressive Arts
* Health and well-being
* Humanities
* Languages
* Literacy and communication
* Mathematics and numeracy
* Science and technology

There will be 3 cross curriculum responsibilities:

* Literacy
* Numeracy
* Digital Competence

Full implementation of the New Curriculum in Wales is planned for September 2022. Curriculum planning documents indicate our preparation for the new curriculum as outlined above but remain organized under existing statutory National Curriculum Requirements for Wales (September 2014).



Careful consideration has been given to the current reform of education in Wales as outlined in the Welsh Government action plan 2017-2021 “Education in Wales: Our National Mission”. Particular attention has been paid to Donaldson’s recommendation that learning experiences for all children need to be real and relevant to all learners. Our co-construction of a new curriculum for Wales will utilities resources available through “Global Futures” and “The United Nations Global Sustainable Development Goals”.

This is policy takes into account Welsh Government recommendations regarding the Foundation phase, National Curriculum 2008, the Literacy and Numeracy framework (LNF). We have taken into account the ‘Successful Futures’ document and how the purposes underpin what is taught and how.

The United Nations Convention on the Rights of the Child (CRC) is at the heart of our school’s planning, policies, practice and ethos. As a rights-respecting school we not only teach about children’s rights but also model rights and respect in all relationships. Our belief in “restorative approaches” ensures that every child is listened to. Within all teaching and learning, numeracy, literacy and digital competency is promoted. Teachers are expected to plan and deliver objectives pitched appropriately to the learners. Lessons have success criteria which include numeracy, literacy and/or digital competency objectives to ensure the learners are aware of the particular skills they are looking to develop within that lesson. Every opportunity is used to promote the ethos of “every child can be the best they can be!”

Within this AoLE it consists of biology, chemistry, computer science , design and technology and physics to enhance pupils’ knowledge and understanding of the world.

At Penyrheol we recognise we are educating children of the future and have a responsibility to ensure we equip them with skills to help them learn more independently and become responsible citizens. It is our aim to provide our pupils with quality opportunities so that they have a positive impact on life-long learning. We understand the importance of equipping our pupils with the knowledge to use 21st Century Technology to support their learning; metacognitive strategies to develop their reflective skills and rich, authentic experiences including visitors and STEM enrichment tasks.

All AoLE are underpinned with challenging opportunities to develop numeracy, literacy and digital competency skills.

All AoLE are formatively assessed and monitored through the school’s planning and assessment tool, and through listening to learners.

The principles underpinning every Area of Learning and Experience (AoLE) in Penyrheol Primary ensures that the curriculum is:-

• authentic: rooted in Welsh values and culture and aligned with an agreed set of stated purposes

• evidence-based: drawing on the best of existing practice within Wales and from elsewhere, and on sound research

• responsive: relevant to the needs of today (individual, local and national) but also equipping all young people with the knowledge, skills and dispositions for future challenges as lifelong learners

• inclusive: easily understood by all, encompassing an entitlement to high-quality education for every child and young person and taking account of their views in the context of the United Nations

Convention on the Rights of the Child (UNCRC), and those of parents, carers and wider society

• ambitious: embodying high expectations and setting no artificial limits on achievement and challenge for each individual child and young person

• empowering: developing competences which will allow young people to engage confidently with the challenges of their future lives

• unified: enabling continuity and flow with components which combine and build progressively

• engaging: encouraging enjoyment from learning and satisfaction in mastering challenging subject matter

• based on subsidiarity: commanding the confidence of all, while encouraging appropriate ownership and decision making by those closest to the teaching and learning process

• manageable: recognising the implications for and supported by appropriate assessment and accountability arrangements.

All teachers are leaders in this AoLE and are expected to plan using the “four purposes” of the curriculum.

These will ensure that our pupils will be:-

1. Ambitious, capable learners who: – set themselves high standards and seek and enjoy challenge – are building up a body of knowledge and have the skills to connect and apply that knowledge in different contexts – are questioning and enjoy solving problems – can communicate effectively in different forms and settings, using both Welsh and English – can explain the ideas and concepts they are learning about – can use number effectively in different contexts – understand how to interpret data and apply mathematical concepts – use digital technologies creatively to communicate, find and analyse information – undertake research and evaluate critically what they find and are ready to learn throughout their lives

2. Enterprising, creative contributors who: – connect and apply their knowledge and skills to create ideas and products – think creatively to reframe and solve problems – identify and grasp opportunities – take measured risks – lead and play different roles in teams effectively and responsibly – express ideas and emotions through different media – give of their energy and skills so that other people will benefit and are ready to play a full part in life and work

3. Ethical, informed citizens who: – find, evaluate and use evidence in forming views – engage with contemporary issues based upon their knowledge and values – understand and exercise their human and democratic responsibilities and rights – understand and consider the impact of their actions when making choices and acting – are knowledgeable about their culture, community, society and the world, now and in the past – respect the needs and rights of others, as a member of a diverse society – show their commitment to the sustainability of the planet and are ready to be citizens of Wales and the world

4. Healthy, confident individuals who: – have secure values and are establishing their spiritual and ethical beliefs – are building their mental and emotional well-being by developing confidence, resilience and empathy – apply knowledge

about the impact of diet and exercise on physical and mental health in their daily lives – know how to find the information and support to keep safe and well – take part in physical activity – take measured decisions about lifestyle and manage risk – have the confidence to participate in performance – form positive relationships based upon trust and mutual respect – face and overcome challenge – have the skills and knowledge to manage everyday life as independently as they can and are ready to lead fulfilling lives as valued members of society.

At Penyrheol we envisage these core purposes overlapping and developing through rich learning opportunities.

At Penyrheol we plan opportunities for the Science and Technology AoLE.

Experiences at Penyrheol in the 4 purposes :

Ambitious capable learners

* Data rich tasks
* Instructional writing / algorithms
* Problem solving in design technology
* Science investigations
* Screen casts to explain and develop metacognition
* Spreadsheets for calculating in rich tasks
* Creating multi-media presentations
* Questioning, planning and researching topics

Enterprising creative contributors

* Challenge areas encompassing scientific enquiry
* Cookery and selling items giving the profit to charitable organisations
* Animations
* Taking risks during scientific investigations.
* Use of ICT to express ideas and communicate

Ethical, informed citizens

* Research topics
* Watching the news and understanding current events such as weather related disasters.
* Through class topics such as ‘Make a difference’ with a focus on sustainability
* Recognise bias and forming opinion during science investigations
* Picture books such ‘through the window’ and ‘belonging’ to highlight sustainabilty issues
* Mad Science presentations, Design to Smile, Dwr Cymru visits, RSPCA, STEM ambassadors.

Healthy, confident individuals

* Half termly internet safety sessions
* Termly science investigations
* Outdoor learning
* Healthy eating celebrations through the year
* Paired and group work, such as creating a finished product in Technology, group work to investigate

AoLE Aims:   
Our aim is to provide experiences and learning which will enable children to have:

• A positive and confident attitude towards science and technology

• An ability to think clearly and use scientific enquiry

• Learn through investigation, with an emphasis on first- hand experience

• To use demonstration, research, exploration and teacher-led investigations when circumstances, resources and the needs of individuals and groups allow

• Teachers need to use their flair, enthusiasm and professional judgement to identify the most sensible, enjoyable and safe methods for the work being conducted

• To develop imaginative thinking in children and to enable them to talk about what they like and dislike when designing and making

• To enable children to talk about how things work, and to draw and model their ideas

• To encourage children to select appropriate tools and techniques for making a product, whilst following safe procedures

• To explore attitudes towards the made world and how we live and work within it

• To develop an understanding of technological processes, products, and their manufacture, and their contribution to our society

• To foster enjoyment, satisfaction and purpose in all of their learning

The principles of the teaching and learning of science and technology at Penyrheol Primary school are:

• To be relevant to the age and ability of the child

• To enrich children’s enquiry skills

• To vary teaching methods ensuring breadth and balance

• To ensure continuity and progression

• To ensure every child feels they can achieve

The strategies for the teaching of science and technology at Penyrheol Primary School are:

• To give each pupil the opportunity to reason and explain orally, using correct scientific terms

• Regular investigative and problem solving work

• The use outdoor environment to promote ‘real life’ investigations and put science into ‘real life’ scenarios

• The use of school topics to allow for cross curricular thematic teaching of science and technology skills, which are combined with literacy and numeracy skills throughout topic themed work

• Controlled differentiation with all pupils engaged in science and technology relating to a common theme, which take into account literacy, numeracy and DCF skills

• A variety of individual, paired and group directed activities, when required

• To provide the children with choice of equipment, methods and tasks where appropriate

• The effective use of open and closed questioning so the child learns through interactive teaching

• The use of I.C.T. to support the key skills taught when appropriate

Assessment in Science and Technology

The school continues to use an online tracking system to assess the skills in the different subject disciplines within this AoLE. Leaders triangulate teacher assessment, planning and learning experiences, which allows them to disaggregrate data for pupils and groups of learners.

AoLE Leader’s Role

It is the responsibility of the Science and Technology leaders to:

• Monitor standards of achievement, quality of learning in the subject of Science and Technology through; analysing planning, monitoring books, listening to learners and through lesson observations.

• Review the Policy and Resources on an annual basis. The review will inform any subsequent change.

• Be responsible for the development, evaluation and review of policy guidelines

• Lead and communicate with the school team effectively

• Support and encourage individuals in the development of their curriculum area

• Identify staff training needs in their subject

• Assist staff and Head teacher in identifying and prioritising needs

• Support staff in their planning of subject

• Provide exemplar material/lessons to support staff

• Review annually the development of staff and AoLe

The AoLE leader must ensure that all staff:

• Deliver the curriculum following the guidelines contained in this document

• Plan and evaluate lessons effectively

• Look after and use all available resources to enhance the experiences for all children

Resources

• Each class has access to appropriate Science and Technology equipment, resources and supporting materials to aid planning.

• Utilise links with cluster Comprehensive (Penyrheol) and use resources from them when required for investigations etc.

• Teachers are responsible for the care and upkeep of resources within their class

• The AoLE is responsible for the ordering of resources, keeping staff up to date with new resources, including ICT programmes.

As we believe that this policy is a ‘work in progress’, we will constantly review and update our learning and teaching through :

-Action research

-professional learning feedback and impact reports

-reflective practice involving all staff.