



Barthol Chapel Primary School

Science Policy

Introduction

Children and young people participating in the experiences and outcomes in the sciences will:

- Develop a curiosity and understanding of their environment and their place in the living, material and physical world
- Demonstrate a secure knowledge and understanding of the big ideas and concepts of the sciences
- Develop skills for learning, life and work
- Develop skills of scientific inquiry and investigation using practical techniques
- Develop skills in the accurate use of scientific language, formulae and equations
- Recognise the role of creativity and inventiveness in the development of the sciences
- Apply safety measures and take necessary actions to control risk and hazards
- Recognise the impact the sciences make on their lives, the lives of others, the environment and on society
- Develop an understanding of the Earth's resources and the need for responsible use of them
- Express opinions and make decisions on social, moral, ethical, economic and environmental issues based upon sound understanding
- Develop as scientifically literate citizens with a lifelong interest in the sciences
- Establish the foundation for more advanced learning and, for some, future careers in the sciences and the technologies

The experiences and outcomes in science provide opportunities for children and young people to develop and practise a range of inquiry and investigative skills, scientific analytical thinking skills, and develop attitudes and attributes of a scientifically literate citizen; they also support the development of a range of skills for life and skills for work, including literacy, numeracy and skills in digital literacy.

Inquiry and Investigative Skills

Through experimenting and carrying out practical scientific investigations and other research to solve problems and challenges, children and young people:

- Ask questions or hypothesise
- Plan and design procedures and experiments
- Select appropriate samples, equipment and other resources
- Carry out experiments
- Use practical analytical techniques
- Observe, collect, measure and record evidence, taking account of safety and controlling risk and hazards
- Present, analyse and interpret data to draw conclusions
- Review and evaluate results to identify limitations and improvements
- Present and report on findings.

The main approaches to science inquiry are:

- Observing and exploring – careful observation of how something behaves, looking for changes over time and exploring ‘what happens if...?’ and ‘how could I...?’ questions
- Classifying – through identifying key characteristics
- Fair testing – through identifying all possible variables and then changing only one while controlling all others
- Finding an association – linking two variables to determine relationships.

Scientific Analytical Thinking Skills

Children and young people develop a range of analytical thinking skills in order to make sense of scientific evidence and concepts. This involves them:

- Being open to new ideas and linking and applying learning
- Thinking creatively and critically
- Developing skills of reasoning to provide explanations and evaluations supported by evidence of justifications
- Making predictions, generalisations and deductions
- Drawing conclusions based on reliable scientific evidence.

Features for Effective Learning

It's important to consider that effective learning requires the following key features:-

- a) Coherent Curriculum
- b) Learning and Teaching
- c) Support for Pupils
- d) Leadership
- e) Partnership Working

Skills of effective learning will be founded on the idea that learners learn best when:

- They understand clearly what they are trying to learn, and what is expected of them
- They are given feedback about the quality of their work and what they can do to make it better
- They are given advice about how to make improvements
- They are fully involved in deciding what needs to be done next and who can give them help if they need it.

Aberdeenshire 3-18 Curriculum Framework

Curriculum Organisers

Practitioners and learners will focus on developing the knowledge and understanding, skills, attributes and capabilities detailed in the experiences and outcomes. The curriculum organisers are:

- Planet Earth
- Forces, electricity and waves
- Biological systems
- Materials
- Topical science
- Inquiry and investigative skills
- Scientific analytical thinking skills

- Skills and attributes of scientifically literate citizens.

Learning and Teaching

In the sciences, effective learning and teaching depends upon the skilful use of varied approaches, including:

- Active learning and planned, purposeful play
- Development of problem-solving skills and analytical thinking skills
- Development of scientific practical investigation and inquiry
- Use of relevant contexts, familiar to young people's experiences
- Appropriate and effective use of technology, real materials and living things
- Building on the principles of Assessment is for Learning
- Collaborative learning and independent thinking
- Emphasis on children explaining their understanding of concepts, informed discussion and communication.

Barthol Chapel School, practitioners aim to engage every child and young person in a range of planned, quality learning experiences which will meet their needs. In planning, preparing and teaching these learning experiences, teachers and educators will:

- Be accountable for their part in delivering a high quality education to ensure the success of the school and all children and young people.
- Know their learners well, and have high expectations of all learners and young people
- Make learning relevant, engaging and progressive, building on prior experiences and learning
- Regularly reflect on the quality of learning, assess its impact and adapt accordingly
- Make effective use of questioning to extend thinking and embed learning
- Make meaningful links in learning and teaching across learning experiences
- Share learning intentions with children and young people and support them to set ambitious but achievable targets.
- Have meaningful dialogue with children and young people about the progress of their learning, and provide advice on how they should take their learning to the next stage
- Communicate effectively with parents and partner agencies on attainment achievement and learning needs of children and young people
- Ensure that children and young people are given feedback about the quality of their work, and what they can do to improve it

Planning

Teachers and other practitioners in planning together will ensuring that experiences are relevant and realistic for the child or young person in his or her circumstances. Provide the children with knowledge of science skills for learning for life and work.

- Within the experiences and outcomes which span more than one level, careful planning is required to ensure appropriate breadth, progression and pace.
- Teachers and other practitioners will plan and present learning in ways that enable learners to use knowledge and skills in different contexts.
- Teachers should make use of Aberdeenshire Progression Framework for Science and national benchmarks as a support tool.
- Additional curricular planning is also required in an appropriate format to support interdisciplinary projects.

Assessment

Assessment in the sciences will focus on children and young people's knowledge and understanding of key scientific concepts in the living, material and physical world, inquiry and investigative skills, scientific analytical and thinking skills, scientific literacy and general attributes. Teachers will gather evidence of progress as part of day-to-day learning, and specific assessment tasks will also be important in assessing progress at key points of learning.

Approaches to assessment will identify the extent to which children and young people can apply these skills in their learning and their daily life and in preparing for the world of work.

Progression in knowledge and understanding will be demonstrated, for example, through children and young people:

- Providing more detailed descriptions and explanations of increasingly complex scientific contexts and concepts
- Using a wider range of scientific language, formulae and equations
- Presenting, analysing and interpreting more complex evidence to draw conclusions and make sense of scientific ideas.

Assessment will also link with other areas of the curriculum, within and outside the classroom, to allow children and young people to demonstrate their increasing awareness of the impact of scientific developments on their own health and wellbeing, society and the environment.

Assessment approaches will help learners to show their progress through the levels and enable them to demonstrate their achievements in a range of ways which are appropriate to learning. For learners to demonstrate that their progress is secure and that they have achieved a level, they will be provided with opportunities to show they:

- Have achieved a breadth of learning across the experiences and outcomes for an aspect of the curriculum
- Can respond to the level of challenge set out in the experiences and outcomes and are moving forward to more challenging learning in some aspects
- Can apply what they have learned in new and unfamiliar situations.

Teachers will use these three aspects to decide when a learner has met agreed expectations and achieved a level, either in a part of a curriculum area, or in a whole curriculum area.

Resources

It is important that the resources used to deliver the experiences and outcomes meet the following criteria:-

- Are relevant to age and stage
- Are current and listed to show whole school progression
- Are purchased to reflect improvement plans
- Have mechanisms for consultation with staff, pupils and parents where appropriate

Monitoring, Evaluation and Review

This policy has been written in consultation with staff, pupils, parents and the wider community.

A copy of the policy will be made available to all stakeholders and monitored and evaluated in line with our Quality Assurance procedures.

This policy is a working document and will be reviewed on an annual basis as informed by local and national developments.