

Mathematical Development / Maths Policy

At Barker's Lane Community School we believe that all pupils should have access to the power and beauty of mathematics and hence enable them to think logically and imaginatively. To become numerate is a life skill and will equip children to lead a fulfilling and successful adult life.

Aims and objectives

Children's mathematical development and learning has to be meaningful to be effective. At Barker's Lane Community School we ensure experiences are relevant and part of children's everyday lives, both indoors and outdoors, emphasising the importance of mathematics in real life. This enables them to use their natural curiosity to make sense of the world around them through developing the ability to reason, to solve problems and to communicate; these are the essence of mathematics. Investigative and experiential learning enables children to understand and appreciate relationships and pattern in mathematics in their everyday lives. Through their progressive development of skills, concepts, knowledge and understanding, children learn to appreciate the contribution made by many cultures to the development and application of mathematics.

At Barker's Lane Community School we aim to:

- stimulate children's curiosity, interest and enjoyment for learning through 'hands on' investigative experiences, play, focussed activities and discussion;
- help children understand the importance of mathematical development in everyday life;
- develop the ability to solve problems through decision-making, drawing on experience, thinking logically and reasoning in a range of contexts;
- promote confidence and competence with numbers and the number system;
- develop a practical understanding of the ways in which information is gathered and presented;
- explore features of shape and space, and develop measuring skills in a range of contexts;
- provide a sense of challenge and achievement for all pupils.

Teaching and learning style

We believe children should acquire and absorb mathematics through a holistic approach to learning. Our principle aim is to develop children's skills, knowledge and understanding through a structured developmental and progressive continuum, taking account of their learning needs and allowing for spontaneous developmental opportunities when they arise. We aim to ensure learning is exciting, challenging and creative, and that learners understand what they need to do to improve and how they can do this.

We develop children's mental recall skills through carefully planned activities and differentiated questions.

Discussing and talking about mathematics and mathematical concepts is fundamental to children's learning and understanding in this area. By becoming involved, actively participating in 'hands on' activities children are better able to understand how things can be ordered and connected, enabling them to begin identifying patterns and relationships.

We recognise all children are different and provide suitable learning opportunities for all children by matching the challenge of the activity to the needs / ability of the child. We achieve this through a range of strategies taking account of all learning styles, extending children's thinking skills, providing opportunities for children to plan, develop and reflect on their own learning through the organisation of the learning environment. We encourage children to learn collaboratively and take some ownership for their own learning with adults facilitating this, willing to learn alongside.

Early on the learning continuum children will be involved in activities which begin developing their problem solving, communicating and reasoning / logical thinking skills. They will have opportunities

to develop early number skills through sorting, matching and counting. Experiential activities will support development with skills in measure, shape and spatial awareness in real and imaginary situations through structured / free play, role-play and using 'small world' resources. As they progress throughout the Foundation Phase, children's confidence in predicting outcomes of problems will increase. They will have a wide variety of methods of communication available to them, including ICT and will become more sophisticated in recognising relationships and in the use of mathematical questioning. Through practical experiential learning opportunities, using a range of resources and ICT, children's understanding of number will develop, increasing their confidence in mental mathematics. They will begin to predict / estimate in a range of contexts including standard measures. Skills and understanding of shape and spatial awareness will extend to include symmetry and angles.

As they progress through Key Stage 2, learners build on the skills, knowledge and understanding they have already acquired during the Foundation Phase. They continue to develop positive attitudes towards mathematics and extend their mathematical thinking by solving mathematical problems, communicating and reasoning mathematically using contexts from across the whole range of mathematics, across the curriculum and as applied to real-life problems. They extend their use of the number system, moving from counting reliably to calculating fluently with all four number operations, including in the context of money, in order to solve numerical problems. They try to tackle a problem with a mental method before using any other approach and use written methods of calculation appropriate to their level of understanding. They develop estimation strategies and apply these to check calculations, both written and by calculator. They explore a wide variety of shapes and their properties and, in the context of measures, use a range of units and practical equipment with increasing accuracy. They collect, represent and interpret data for a variety of purposes. They select, discuss, explain and present their methods and reasoning using an increasing range of mathematical language, diagrams and charts.

Planning for Mathematical Development

Mathematical Development is taught to all pupils at Barker's Lane Community School, taking account of Curriculum for Wales: revised FP Areas for Learning and KS2 Programmes of Study (2015). Learners in mathematics and numeracy are expected to become accomplished in the following:

Developing numerical reasoning
Using number skills
Using measuring skills
Using data skills

The mathematics PoS also develops learners' skills in:

Using geometry skills
Using algebra skills

Effective teaching integrates the elements and also emphasises the importance of mathematics in real life contexts, for example:

- financial literacy e.g. budgeting, saving, hire purchase and mobile phone rates
- bilingualism and the Curriculum Cymreig e.g. using real life data with a Wales context
- valuing diversity e.g. contexts such as Welsh, Celtic and Indian patterns; interpreting and discussing demographic data about life expectancies around the world
- twenty first century issues e.g. maths in modern industry, medicine, research, science & technology

Planning is carried out in three phases (long-term, medium-term and short-term). The long-term plan maps out the skills / learning challenges to be covered in the Foundation Phase and for Key Stage 2. The Curriculum Leader liaises with colleagues to establish these.

Our medium-term plans give further details of learning challenges for each term. These plans focus on developing children's skills, determine the learning challenges and ensure an appropriate balance across the term. The Curriculum Leader keeps a copy of these plans and reviews them with colleagues.

Short term plans are completed on a weekly basis by individual teachers / teams of teachers. Each teacher keeps these individual plans, and the teachers and the Curriculum Leader discuss them on an informal basis. The SLT monitors plans each half-term.

Mathematical skills are planned to build upon children's prior learning. Whilst there are opportunities for children of all ability levels to develop their skills, knowledge and understanding, there is planned progression built into the scheme of work, so that children are increasingly challenged as they progress.

Planning takes account of key skill development, including the development of children's thinking skills through a variety of problem solving and investigational experiences.

The Literacy & Numeracy Framework (LNF)

The Literacy and Numeracy Framework (LNF) is incorporated into the revised AoL and PoS and sets expectations for learners to develop and apply their literacy and numeracy skills across the curriculum.

Literacy skills in oracy, reading and writing; and numeracy skills in numerical reasoning, number, measures and data are planned for across all areas of the curriculum.

Skills across the curriculum

Thinking Skills

Learners develop their thinking across the curriculum through the processes of **planning, developing and reflecting**.

In mathematics, learners will have opportunities to:

- ask questions, explore alternative ideas and make links with previous learning in order to develop strategies to solve problems
- gather, select, organise and use information
- identify patterns and relationships
- predict outcomes, make and test hypotheses, reason mathematically when investigating, and analyse and interpret mathematical information
- describe what they have learned, reflect on their work by evaluating their results in line with the original problem, and justify their conclusions and generalisations.

Digital Skills

Learners develop their digital skills across the curriculum by **finding, developing, creating and presenting information and ideas** and by using a wide range of equipment and software.

In mathematics, learners use a variety of ICT resources to:

- find, select, organise and interpret information, including real-life data
- to explore relationships and patterns in mathematics
- to make and test hypotheses and predictions
- to create and transform shapes
- to present their findings using text, tables and graphs.

Learners are given opportunities to use a variety of digital resources, including calculators, presentation software, databases and spreadsheets, the internet, digital instruments and programmable toys as tools to help develop their mathematical skills and understanding.

The use of digital skills has a central place in activities provided for learners.

In addition to this at Barker's Lane Community School we take account of statutory requirements and cross curricular themes, such as the Curriculum Cymreig and personal and social education, which includes equal opportunities, food and fitness and sustainable development.

At Key Stage 2, learners at Barker's Lane Community School are given opportunities to build on the experiences gained during the Foundation Phase, and to promote their knowledge and understanding of Wales, and their personal and social development and well-being.

Curriculum Cymreig

Mathematics contributes to the Curriculum Cymreig by offering learners the opportunity to learn and apply mathematics in the context of data from their own local community, from the local and national environment, and from current issues related to Wales. The traditional Welsh vocabulary for some numbers and Welsh quilt and Celtic patterns provide investigative opportunities to contribute to learners' development of a sense of Welsh identity.

Personal & Social Education

Mathematics contributes to learners' personal and social education by providing opportunities to apply mathematics to real-life problems.

It helps them to analyse and interpret information presented to them on environmental and other twenty-first century issues, and to develop an informed and challenging attitude to real-life information, questioning its validity and recognising its implications for their world.

Additional Learning Needs

Mathematical skills are developed with all children, whatever their ability. It forms part of a broad and balanced education for all children.

Learning opportunities are matched to the needs of all children to include challenge and support for our most and least able children. When necessary these take account of any relevant targets set for individual children in their Individual Education Plans (IEPs).

Equality

Equality is always observed with positive attitudes being developed. We will not unlawfully discriminate on grounds of age, disability, gender, gender reassignment, race or ethnicity, religion or belief, sexual orientation, marriage or civil partnership, pregnancy and maternity or on the grounds of Welsh language.

All pupils, their parents and guardians, volunteers, staff and school governors are valued and will be treated with dignity and respect. The school will not tolerate any form of discrimination, harassment or victimisation.

We will work across our school community to ensure our commitment to equality and fairness is shared and take steps to ensure that our school is accessible, welcoming and inclusive.

Health and Safety

Children are encouraged to discuss safety implications concerning themselves and their fellow pupils when working. We aim to ensure pupils work in an environment which is safe and hazard free at all times.

Parental Involvement, Partnerships & Community

Parents and members of the community are encouraged throughout the school to support their children's learning. We actively promote parent's support with mental mathematics, number bonds

and multiplication tables. Y1-6 children are regularly provided with online homework to consolidate and extend their mathematical skills. Occasionally this is supported by practical / paper based tasks.

We offer bi-annual parental workshops for numeracy.

Liaison / Transition

Whole school planning allows for smooth transition between phases. Liaison between teachers, pre-school settings and local high schools allows for smooth transition, progression and continuity from pre-school to FP to KS2 to KS3.

We offer Number & Play activities as part of our pre-school transition in the term before a child enters Nursery.

Assessment and Recording

Statutory assessments are carried out in the first six weeks in Reception using an observation based assessment tool, the Foundation Phase Profile (FPP). The FPP is also utilised with Nursery to provide on-entry information.

Pupils are statutorily assessed on-entry to Reception. Assessments in Early Years are utilised to plan for the beginning of each child's learning journey at Barker's Lane.

Statutory assessment at the end of Foundation Phase and Key Stage 2 consists of teacher assessment during the Summer term in Year 2 and Year 6. These assessments:

- are based on the teacher's knowledge of how the learner performs across a range of contexts
- takes into account different strengths and areas for development in that learner's performance
- is checked against adjacent outcomes / level descriptions to ensure that the outcome / level judged to be the most appropriate is the closest overall match to the learner's performance in the attainment target.

From Summer 2018, Y2 pupils have been assessed against recalibrated outcomes which were revised against the expectations in the revised AoL.

Personalised assessments in Procedural Numeracy and national tests in Numerical Reasoning are taken by Y2 to Y6 pupils. Information from these tests is shared with parents and used diagnostically to inform next steps in learning.

Teachers assess children's work in mathematics from three aspects (short-term, medium-term and long-term). We make short-term assessments through observation and marking which are used to help adjust daily plans. These short-term assessments are closely matched to learning challenges and are recorded as part of on-going formative assessment records.

We make medium-term assessments on a termly basis to measure progress / inform next steps for learning by making judgements as we observe children participating in activities and by looking at their written work. We make a judgement against outcomes / level descriptors which takes account of F.P and N.C guidance. These assessments are recorded, used to plan for future learning and retained in pupil portfolios.

We make long-term assessments during the Summer Term, and we use these to assess progress against school and national targets. We pass this information on to the next teacher at the end of the year, so that s/he can plan for the new school year. The previous class teacher and new class teacher together then review / set targets for the next school year, the following Autumn Term.

These records inform parents' evening discussions and also enable the teacher to make an annual assessment of progress for each child, as part of the child's annual report to parents.

Resources

There are a wide range of resources, including digital resources to support mathematics across the school. These are housed in classrooms and in central resource areas.

Monitoring and Review

Monitoring the standards of learning and the quality of teaching in mathematical development / mathematics is the responsibility of the Curriculum Leader. The work of the Curriculum Leader also involves supporting colleagues, being informed about current developments, and providing a strategic lead and direction for this learning area within the school. The Curriculum Leader liaises with staff, the headteacher and indicates areas for improvement. This is recorded on our School Improvement Plan and shared with staff and governors termly.

This policy was compiled by Mrs A West in June 2012 in consultation with all staff and the governing body. It was reviewed in November 2015 by Mrs West. The latest review was in October 2019 and it will be amended to reflect the requirements of Curriculum 2022 as appropriate.