

“Working, Praying, Sharing and Learning Together”
“Gweithio, Gweddiwn, Rhannu a Ddysgu gyda’n Gilydd”



St Mary's R.C. Primary School

Mathematics Policy

This document is a statement of the principles, aims and strategies for the teaching of mathematics at St Mary's RC Primary School, Brynmawr.

Prepared by: Kylie Flynn, Lead Practitioner

Date: 29th February 2016

Approved by Governing Body: _____

Date: _____

To be reviewed: _____

Date: _____

'Mathematics introduces children to concepts, skills and thinking strategies that are essential in everyday life and support learning across the curriculum. It helps children make sense of the numbers, patterns and shapes they see in the world around them, offers ways of handling data in an increasingly digital world and makes a crucial contribution to their development as successful learners.

Children delight in using mathematics to solve a problem, especially when it leads them to an unexpected discovery or new connections. As their confidence grows, they look for patterns, use logical reasoning, suggest solutions and try out different approaches to problems.

Mathematics offers children a powerful way of communicating. They learn to explore and explain their ideas using symbols, diagrams and spoken and written language. They start to discover how mathematics has developed over time and contributed to our economy, society and culture. Studying mathematics stimulates curiosity, fosters creativity and equips children with the skills they need in life beyond school.'

(National Curriculum 2000)

Mission Statement

At Saint Mary's we believe that Mathematics is the key to a world of learning and opportunity. We expect all our pupils, regardless of gender, to become accomplished in using Mathematics across the curriculum to discover, understand, imagine and express. We believe that the teaching of Mathematics is the responsibility of all teachers and should be planned for and delivered through all subject areas. All teachers are teachers of Mathematics and should be good role models at all times.

Aims

At St Mary's RC Primary School we aim to help all pupils to reach their full potential in mathematics by:

- ◆ developing their confidence and competence with numbers and measures - the proficiency of numeracy
- ◆ providing opportunities to apply their mathematical learning to a range of real-life contexts in mathematics and in other subject areas
- ◆ encouraging the skills required to communicate ideas about mathematics
- ◆ fostering a sense of inquiry and an enthusiasm and enjoyment for the nature of mathematics

To fulfil these requirements our pupils should:

- ◆ have a sense of the size of a number and where it fits into the number system;

- ◆ know by heart number facts such as number bonds, multiplication tables, doubles and halves;
- ◆ use what they know by heart to figure out answers mentally;
- ◆ calculate accurately and efficiently, both mentally and with pencil and paper, drawing on a range of calculation strategies
- ◆ recognise when it is appropriate to use a calculator, and be able to do so effectively;
- ◆ make sense of number problems, including non-routine problems, and recognise the operations needed to solve them;
- ◆ explain their methods and reasoning using correct mathematical terms;
- ◆ judge whether their answers are reasonable and have strategies for checking them where necessary;
- ◆ suggest suitable units for measuring, and make sensible estimates of measurements;
- ◆ explain and make predictions from the numbers in graphs, diagrams, charts and tables;
- ◆ develop spatial awareness and have an understanding of the properties of 2-D and 3D shapes
- ◆ use patterns and relationships in mathematics to solve puzzles and problems about numbers and shapes

Statutory Requirements

Statutory requirements for the teaching and learning of Mathematics are laid out in *Mathematics in the National Curriculum for Wales (2008)*, *Revised Framework for Children's Learning for 3 to 7-year-olds in Wales (2015)* and *The National Literacy and Numeracy Framework (2014)*.

In the Foundation Phase pupils should be given opportunities to:

- develop their skills, knowledge and understanding of mathematics through oral, practical and play activities.
- enjoy using and applying mathematics in practical tasks, in real-life problems, and within mathematics itself.
- use a variety of ICT resources as tools for exploring number, for obtaining real-life data and for presenting their findings.
- complete much of their work orally.
- develop their use and understanding of mathematical language in context, through communicating/talking about their work.
- ask and respond to questions, and explore alternative ideas.
- use appropriate mathematical language to explain their thinking and the methods they use to support the development of their reasoning.

- develop a range of flexible methods for working mentally with number, in order to solve problems from a variety of contexts, checking their answers in different ways, moving on to using more formal methods of working and recording when they are developmentally ready.
- explore, estimate and solve real-life problems in both the indoor and outdoor environment.
- develop their understanding of measures, investigate the properties of shape and develop early ideas of position and movement through practical experiences.
- sort, match, sequence and compare objects and events, explore and create simple patterns and relationships, and present their work in a variety of ways.

At Key Stage Two pupils should be given opportunities to:

- build on the skills, knowledge and understanding they have already acquired during the Foundation Phase.
- 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.
- 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.
- 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.
- develop estimation strategies and apply these to check calculations, both written and by calculator.
- 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.
- collect, represent and interpret data for a variety of purposes.
- select, discuss, explain and present their methods and reasoning using an increasing range of mathematical language, diagrams and charts.

In all subject areas pupils should be given opportunities to:

- develop their skills in numerical reasoning, number, measuring and data for different purposes.
- select and apply these skills in ways that are appropriate to each context.

For appropriate skills for each year group see Numeracy Framework.

Subject Organisation

'Mathematics in the National Curriculum for Wales' describes what should be taught in KS2 and the 'Framework for Children's Learning for 3 to 7-year-olds in Wales', describes what should be taught at Foundation Phase.

St Mary's RC Primary School, Brynmawr follows the EAS Numeracy Team documentation for Mathematics, 'TAPAS' and 'Excellence in teaching of Mathematics', which provides detailed guidance for the implementation of the new curriculum orders.

Mathematics lessons are taught daily in all classes from Nursery to year 6. Work is differentiated to suit the needs and ensure the progress of each individual learner. Numeracy skills are beginning to be taught and developed across all areas of the curriculum in all classes. In the Foundation Phase pupils are given to opportunities to practise and develop Numeracy skills in all areas of provision both inside the classroom and throughout the outdoor areas.

Every classroom in the school has a TAPAS display area to allow pupils to interact with their learning and to promote the importance of mathematics.

Planning

Planning begins from a thorough understanding of pupil's needs, through effective and rigorous assessment and tracking, combined with high expectations and ambition for all pupils to achieve.

Medium term planning is taken from the appropriate mathematical document for each year group. It outlines the areas of mathematics that will be taught during the term to ensure coverage of the National Curriculum.

Within short term planning, when appropriate, clear success criteria for most learning objectives taught will be created, demonstrating the progression needed to reach and exceed the objective. This will enable the class teacher to follow a clear and systematic teaching sequence, where input and activities are differentiated by considering which parts of the success criteria individual pupils are ready for.

Where children are working significantly above or below the objective the majority of the class need to work towards, and where extending this by expanding the success criteria seems inappropriate, objectives from higher or lower age-groups will need to be planned and taught.

Planning, where possible, should involve real life contexts for maths, where pupils are problem solving with a purpose in mind.

Class teachers should regularly plan for opportunities for pupils to apply their maths skills to different problems within maths lessons and across the curriculum. This will also allow pupils to revisit, practice and consolidate different areas of maths and apply them within different contexts.

Teaching

At an early age, pupils are given the opportunity to develop their understanding of number, measurement and data skills through a combination of short, formal teaching as well as a range of planned structured play situations, where there is plenty of scope for exploration.

Pupils will become very competent 'counters' so that their fluency with the number system provides a foundation for mathematical understanding. Counting forwards and backwards in many different sized steps as well as from different starting and ending points is essential.

Maths learning builds from a concrete understanding of concepts where pupils are manipulating objects. When pupils are able to see concepts this way, they then need to understand the same concepts represented pictorially. Pupils are then ready for abstract representation before being able to apply their knowledge to different situations.

Pupils should be encouraged at all times to communicate their understanding of maths so that it clarifies their thoughts.

Pupil's mental maths is of great importance, with number bonds, times tables facts and various strategies for calculation taught and practiced during 'Mental Warm Up' sessions at the beginning of each mathematical lesson.

A progression towards efficient written calculations should be developed and applied consistently in each year-group. Years 2-6 to follow EAS written method guidelines appropriate for their year group.

Class targets should be used to ensure areas where the majority of the class have not grasped a concept can be revisited and mastered.

Though the nature of lessons will be very different depending on the needs of the class, pupils should be: active; practicing skills they haven't yet mastered (perhaps recapping on class targets); learning something new or learning to apply their knowledge to different contexts. They should be: 'doing' very quickly; working at a good pace and being productive; sharing their thoughts and methods and being successful.

When teaching problem solving skills across the curriculum (noted above), time (and sometimes whole lessons) should be given to each aspect of problem solving ensuring children get thorough practice at: 'preparing for problem solving', 'thinking through problems to establish what they know and don't know so far'; actually 'doing the problem solving' effectively and 'communicating the answer effectively'. They should evaluate the process too. Over time pupils will improve at each aspect.

Assessment

Assessment for learning should occur throughout the entire maths lesson, enabling teachers/teaching assistants to adapt their teaching/input to meet the pupil's needs. This feedback should be incisive and regular.

When appropriate, pupils should self-assess against the learning objective and success criteria, giving them a sense of success. Pupils should know when they are meeting their targets and be self-assessing against those too.

Pupil's work should be marked in line with the Marking Policy and should model how corrections should be made, giving children a chance to learn from their misconceptions or incorrect methods.

Assessment of pupil work and progress is ongoing by the class teacher and informs future planning.

Summative assessments are made at least once per half term in order to provide further understanding of the level a pupil is working at and to inform a more rounded judgement of their abilities.

Tracking is used in order to highlight pupils who are not making good progress over time. These pupils are then targeted for support in one form or another. What that support will be and how intensive, depends upon the pupil's needs and it may be a simple strategy within whole class teaching that is needed. Where further support is deemed necessary, pupils can access interventions, explained below.

Display and Resources

In the classrooms there should be, either on display or easily accessible to pupils, level appropriate resources, particularly concrete and pictorial apparatus to support pupils in grasping concepts.

Mathematical vocabulary should be displayed so that pupils use this in the communication of their understanding.

There should be maths work on display in classrooms and in other areas of the school in order to encourage a positive attitude and enthusiasm towards mathematics for all groups of pupils.

Guidance for Teachers and Teaching Assistants

Class teachers should complete weekly short term plans with objectives taken from their planned medium term plans found in their 'Excellence in Teaching' booklet, linked to their class specific document (TAPAS mentioned above).

Teaching Assistants are to be actively involved in the planning process, to understand the needs of the pupils and to be aware of the week's activities.

Mathematics should be taught each morning for 60mins broken down as follows:
Warm up (10mins), Main Input, Differentiated Activities: 2xfocussed 2x independent and plenary.

Resources to assist with the planning, teaching and assessment of mathematics can be found in the shared area of the school's computer network.

Interventions

Catch Up Numeracy

This is a program recommended by EAS to assist pupils with their understanding of Numeracy. It is to be run in Years 2, 3, 4, 5 and 6.

Year 2 and Year 6 have specific teaching files for the fully trained teaching assistant to work from but Years 3, 4 and 5 will use springboard activities to teach each session. The program involves a group of 6-8 pupils working with a fully trained teaching assistant for two extra sessions per week for a period of 10-12 weeks. During these sessions the pupils will take part in various numeracy activities which will develop their understanding of basic number concepts and skills and should mirror the teaching that takes place within the classroom.

The pupils are identified and grouped according to the National Numeracy tests and Summer Alfie Data by the Mathematics Lead Practitioner and ARR Practitioner.

The pupils are separated according to the objectives they need further reassurance on.

Pupils are to undertake an initial assessment given by the EAS at the start of the 10-12 weeks program and are then reassessed at the end to show value added.

Throughout the Autumn Term each objective has been taken from the previous year's Summer Alfie tests. This is to ensure the pupils have a secure knowledge in the gaps they have misunderstood in the previous class TAPAS programme. For example: Year 3 will consolidate Year 2 objectives, Year 4 will consolidate Year 3 objectives, Year 5 will consolidate Year 4 objectives and Year 6 will consolidate Year 5 objectives.

Groups for the Spring Term are identified and grouped according to the Autumn Alfie Data and teacher assessment. The pupils will be separated into groups according to how many pupils will require the extra support. The structure for each TA will be the same as the Autumn term:

During the Summer Term, each pupil will have objectives that they find difficult within their class TAPAS programme, which will hopefully support them to reach their full potential in time for the National Numeracy Tests.

Number Recovery

This is an early intervention program recommended also by the EAS to assist younger pupils with their understanding of numeracy. It aims to target low ability pupils in Year 1 and Year 2 who are experiencing difficulties accessing the core work. The program involves a small group of children working with a fully trained teaching assistant for 30 minute sessions, four times a week for a period of 10-12 weeks.

Number Recovery is set up into four initial assessments:

Assessment A:

- Reciting numbers forwards, number after, identifying numbers, reciting numbers backwards, number before, sequencing numerals, addition and subtraction, visible, hidden, count on/back and mental strategies.

Assessment B

- Spatial patterns, Finger patterns, five frame patterns, ten frame patterns, bonds of 5 and bonds of 10.

Assessment C and D

- Counting in tens on the decade, counting in tens off the decade and using mental strategies to calculate

These initial assessments give the teaching assistant a 'best fit tier' to which they group the pupils, along with the class teacher accordingly and plan four sessions over the week to include elements of the Number System, Numerals, Counting and Calculating, Spatial Awareness, Finger Patterns and Grouping and Sharing.

At Saint Mary's we strive to give all our pupils the ability to access number at their level of ability. Under the guidance of EAS and the Lead Practitioners training we have decided to trial Number Recovery with our KS2 pupils who have additional learning needs.

Monitoring and review

Monitoring of the standards of pupil's work, interventions and of the quality of teaching in mathematics is the responsibility of the Lead Practitioner and the SMT. It is carried out through interviews with the pupils and book scrutiny. The work of the Lead Practitioner also involves supporting colleagues in the teaching of mathematics, being informed about current developments in the subject, and providing a strategic lead and direction for the subject in the school. The Lead Practitioner gives the head teacher a subject evaluation in which he evaluates strengths and weaknesses in the subject and indicates areas for further improvement via an action plan. The head teacher allocates regular management time to the Lead Practitioner so that she can review samples of children's work and undertake lesson observations of mathematics teaching across the school.

The Governing Body

Regular reports are made to the governors on the progress of Mathematics provision and to our Mathematics Governor

This policy will be reviewed every three years or in the light of changes to legal requirements.

Parental Involvement

Parents are supported and encouraged in helping their child with Mathematics.

Homework is set on a regular basis and teachers are encouraged to set work which makes use of the home context, to reinforce the context of real mathematics.

Workshops and leaflets for mental and written methods are to be available for all parents, giving them support to learn new strategies.

Conclusion

This policy also needs to be in line with other school policies and therefore should be read in conjunction with the following school policies:

Teaching and Learning Policy

Assessment and Record Keeping

Marking policy

Special Educational Needs Policy

ICT Policy

Equal Opportunities Policy

Health and Safety Policy

Individual Subject Policies (re LNF)

