Bullion Lane Primary School

Maths Policy

At Bullion Lane we aim to create a sense of excitement and curiosity around mathematics. We recognise that a high-quality Maths education provides the foundation for understanding of the world, and that Maths is essential to everyday life and necessary in almost all forms of employment.

It is our intention that all pupils will:

- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems.
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.
- solve problems by applying their mathematics to a variety of routine and nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Planning

We use the White Rose schemes of work as a guideline to support planning. These provide a curriculum overview for the year, and progressive guidelines for each unit which is broken down into:

a) varied fluency
b) reasoning and problem solving.

The schemes provide 'blocks' of learning which focus on different topics. They provide 'small steps' which are used as the basis for planning, enabling the planning of units to be adapted to suit the needs of the class. This allows time for planning reflection and revision of previous learning, as well as engaging children with a variety of topics. The schemes also provide key questions, stem sentences and reasoning examples to encourage the correct mathematical language and terminology when explaining methods.

We have chosen to use the White Rose schemes because we feel they adhere to certain key principles which we consider to be important in the delivery of an outstanding Mathematics curriculum.

The White Rose materials provide an excellent guide to the planning of a curriculum that is rich in opportunities for fluency, reasoning and problem solving. Whilst these ideas are not exhaustive, if followed well these planning materials provide an excellent basis for a rich diet of reasoning and problem-solving opportunities.

We have a range of subscriptions to websites that provide teaching and learning resources to supplement planning: Classroom Secrets, Hamilton Trust, Times Table Rock Stars and Twinkl.

Basic Skills

We place a great emphasis on the acquisition of Basic Skills. It is essential that children become fluent in number facts so that they can calculate with ease.

The use of images and practical equipment (Base 10, Numicon, cubes, bead strings, tens frames, Rekenrek) is central to introduce number concepts and methods of calculation.

Below are the expectations for Basic Skills for each year group:

Year	Key skills to be taught
EYFS	Begin to use number bonds to 10 Begin to count in steps of 2, 5 and 10
Year 1	Use number bonds to 10 and 20, including all related addition and subtraction facts Count on in steps of 2, 5 and 10
Year 2	Rapid recall of times table and corresponding division facts: X 2, X 5, X 10, X 3
Year 3	Rapid recall of times table and corresponding division facts: X 6, X 4, X 8
Year 4	Rapid recall of all times table and corresponding division facts up to 12 x 12
Year 5	Rapid recall of all times table and corresponding division facts up to 12 x 12
Year 6	Rapid recall of all times table and corresponding division facts up to 12 x 12

Children are tested at least every month on the acquisition of basic skills using timed standard tests and other competitive situations using different websites and subscriptions including Times Tables Rock Stars, Big Maths Beat That Tests and Sumdog. Their scores are then recorded using the school assessment record sheet using timestables.co.uk – multiplication check.

The expectation is that children complete 50% of the test accurately in the time allowed by Christmas, 75% by Easter and 100% by the end of the year. These will be tracked and interventions should be put in place for any pupils at risk of falling behind. When pupils achieve 100% on the test, they are rewarded with a certificate which is given out in the whole school achievement assembly on a Friday.

Knowledge of times tables are consolidated to the 12 times table by Year 4, who prepare for the MTC (Multiplication Table Check). 'Times Tables Rock Stars' is used regularly to support the learning of times tables. Regular 'battles' are set up on Times Tables Rock Stars to encourage participation, as well as a class reward for winning each battle, which is awarded during whole school achievement assembly using inflatable guitars where the pupils 'rock out'.

Problem solving

At Bullion Lane we believe that enquiry-based learning and regular exposure to a wide range of routine and non-routine problem-solving activities are key to fostering a lifelong love of learning and the development of creativity and flexible thinking that will be essential to success in further education and future employment.

Routine problem solving in Mathematics generally refers to word problems. A key skill is taught, such as the column method for addition, and children apply that skill to solve a range of problems. If asking children to complete word problems, it must be remembered that an appropriate level of challenge must be maintained. It is not sufficiently challenging, for example, to present children with a series of one-step problems that all require the same operation and can be solved simply by underlining the numbers and performing the calculation without reading or thinking through the problem. Additional challenge can be built in through the inclusion of additional steps and / or parts of a problem which may require a different operation.

Non-routine problems can include the following types of challenge:

- Missing number / missing operation problems
- Finding all possibilities
- Explaining an error
- Starting with the answer; what was the question?
- Finding rules and describing patterns
- Logic problems
- Visual puzzles

Concrete-Pictorial-Abstract (C-P-A)

At Bullion Lane, we believe that it is essential that mathematical concepts are introduced following the C-P-A model to allow for a deep understanding to be built. Children need time to explore mathematical concepts physically using concrete materials such as cubes, Numicon, bead strings, Rekenrek, tens frames, base 10 materials etc, before progressing to visual representations of a concept. Once children have explored a concept fully using concrete materials and visual images, they should then progress to working on the abstract representation of a concept or procedure.

Sometimes it may be appropriate to be working on concrete, visual and abstract representations within a single lesson; at other times, children may work with concrete resources only over a sequence of lessons.

The school's calculation policy has been designed with this approach in mind. Teachers should refer to the policy for guidance on how mathematical concepts should be introduced to pupils following this approach.

Calculation policy

The school follows the White Rose Maths calculation policy. As stated above, we believe it is essential that mathematical concepts are introduced following the Concrete-Pictorial-Abstract model, and the policy provides guidance on the concrete and pictorial representations that should be used to introduce a calculation concept. It also stipulates the Mathematical language that is to be introduced at each stage of learning, as Mathematical vocabulary is a key driver for our whole curriculum. With its strong emphasis on discussion and collaborative problem solving, our mathematics curriculum supports the development of language in a way that is rigorous, thorough and sequential.

It is important that the document is followed closely as it provides a clear basis for an effective journey through the stages of calculation that is sequential, progressive and aligned with the needs of the National Curriculum 2014. Following the policy also allows for teachers to have a clear picture of the building blocks that have been laid in the preceding year(s).

If you require guidance, or you have a query or suggestion for how a section of the policy could be improved, then the subject leader is available for any such discussions.

Lessons

To provide adequate time for developing maths skills, each year group provides a daily maths lesson. Within these lessons, there is be a balance between whole class work, group teaching, practical tasks and individual practice. Some maths activities may take place outside of the maths lesson, e.g., TTRS, Sumdog, Flashback 4 and fluency sessions.

A Typical Lesson – the information below serves only as a guide.

- **Mental and oral warm-up** – this will involve the whole class in tasks which aim to revisit and revise previous learning, and develop mental and oral skills.
- **Main teaching activity** – this includes the teachers input and pupil activities, during this time expectations and success criteria will be shared. This is an opportunity for pupils to make links to and recap prior learning, to demonstrate learning on whiteboards and to share mathematical thinking using mathematical vocabulary.
- **Independent tasks** – pupils practice their learning by completing fluency, reasoning and problem-solving tasks.
- **Plenary** – this will usually happen at the end of the lesson but a teacher may use 'mini plenaries' during the lesson if any misconceptions have been identified. At the end of the lesson, the learning will be reviewed by the teacher and children and links made to future learning.

Presentation/expectations

We place great importance on the presentation of children's work. It is important that children set out work in Maths neatly, as this supports mathematical accuracy. It is also essential that we constantly encourage children to take pride in their learning and to view what they produce as having real value and importance.

Sometimes teachers may ask the children to fold a page in half in order to make maximum use of space. On other occasions teachers may wish for work to be completed over a full page. This is entirely at the teacher's discretion, as long as the expectation is made clear to the pupils.

Cross curricular links

Although Mathematics is taught as a stand-alone subject, every effort is made to link mathematics with other areas of the curriculum. We draw children's attention to the link between mathematics and other curricular work so children see that mathematics is not an isolated subject. E.g., science experiments, geography map skills, DT measuring, music beats and patterns, etc.

Marking & Assessment

Assessment is continuous and ongoing. Formative and summative assessments are used to inform teaching in a continuous cycle of planning, teaching and assessment.

Short term formative assessment, that takes place within lessons through questioning and observations and at the end of a lesson through marking, provides the most accurate picture of children's progress and understanding. Every piece of maths work should be marked, and planning should be adapted according to teacher's evaluation of the children's progress.

Detailed feedback is not required for every piece of work, and sometimes it may be appropriate to offer verbal feedback on a piece of work, in which case the VF code (VF) should be used next to the work in the book. When verbal feedback is given, it is helpful if there is still a response from the child, for example a correction completed next to the VF code.

More detailed feedback should provide a range of both challenges and comments which address misconceptions and help pupils to correct an error. If a pupil has made several mistakes in a piece of work, it would not be appropriate to provide a challenge; marking should be used to address the pupil's

difficulty with the piece of work, in this instance. Detailed feedback must be responded to by the pupil, and their response must be acknowledged.

Self and peer assessment is an effective and important strategy for helping children to realise where they have been successful and where they may have gone wrong. Any self or peer marking should be neatly presented. The teacher must still acknowledge the work, and provide feedback if there is evidence of a misconception or difficulty.

See the school's Marking Policy for further guidance.

White Rose mini assessments are usually used at the end of 'block' units to assess learning and inform future learning.

Termly, teacher assessments are made against 'Age Related Expectations'. Formal summative assessments are used to help inform teacher assessments. These help to monitor pupil progress throughout the year and inform any necessary intervention or gaps in knowledge which need addressed.

Summative assessment takes place three times a year in December, March and late June / early July using the Testbase assessments and are used to assess and review pupils' progress. These assessments are used to help inform teacher assessments for individual pupils against 'Age Related Expectations'. Compulsory National Curriculum Mathematics tests are completed at the end of Year 6.

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