



Blossom Federation

Daubeney, Sebright and Lauriston



Maths Policy 2022



Vision

Our vision at Blossom Federation is to nurture a life-long love and confident use of Maths. We aim to develop lively, enquiring minds encouraging pupils to become self-motivated, confident and capable in order to solve problems that will become an integral part of their future. Through their school career they are able to develop an identity as a mathematician, so they are ready for Secondary School.

Purpose

There are four main purposes to this policy:

- To establish an entitlement for all pupils;
- To establish expectations for teachers of this subject;
- To promote continuity and coherence across the school;
- To state the school's approaches to this subject in order to promote public, and particularly parents' and carers', understanding of the maths curriculum.

Aims

Maths is an integral skill that will support children's readiness for the world. We want children in our school to become enthusiastic, independent and reflective learners. Essentially, we want children to love Maths.

Aims

- Ensure that the Maths curriculum equips teachers with the knowledge and understanding to ensure all pupils are confident in arithmetic and reasoning.
- Outline our approach to ensure that all children receive a progression of key skills and knowledge in Maths.
- All pupils become fluent in the fundamentals of maths, so that they have a conceptual understanding and are able to recall and apply their knowledge rapidly and accurately
- To develop pupil's ability to communicate information and ideas, orally, graphically and symbolically, using precise mathematical language
- Pupils to acquire increasing precision in use of language and written procedures interpreting diagrams and notation, providing explanations and reasons for their methods and choices.
- Help children recognise the value of Maths as a life skill and solve problems by applying their mathematical knowledge to a variety of problems.
- To foster a love of maths
- To provide equal opportunities for all pupils to learn maths, irrespective of race/gender/class/ability and have high expectations for all. To achieve this, we use a '**Mastery**' approach to our lessons, whereby children are taught through **whole-class interactive teaching** where the focus is on all children working together on the same lesson content at the same time to master the content of the National Curriculum 2014.

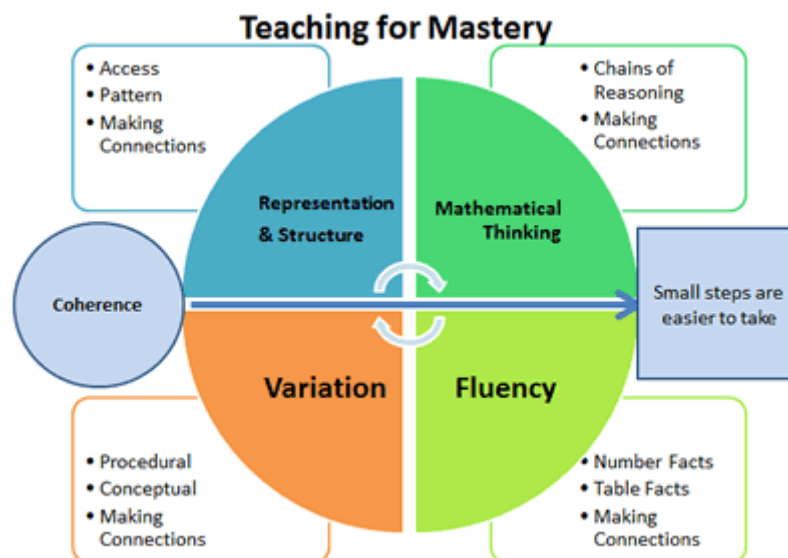


- Explore new mathematical concepts using a **CPA (Concrete, Pictorial and Abstract)** approach to allow pupils to spend longer on key mathematical concepts, in particular number, to develop a deep knowledge of key ideas.
- Maths planning is based on the **2014 National Curriculum** and enhanced by a wide range of resources (**White Rose** and **NCETM's Professional Development documentation (2019)**). This ensures a progressive and thorough curriculum in every year group. Teachers know which objectives must be taught and assessed in each year group and can follow progressive small steps to ensure pupils have a comprehensive understanding of maths.

Mastery Approach

Mastering maths means pupils of all ages acquiring a deep, long-term, secure and adaptable understanding of the subject. The phrase 'teaching for mastery' describes the elements of classroom practice and school organisation that combine to give pupils the best chances of mastering maths. Achieving mastery means acquiring a solid enough understanding of the maths that's been taught to enable pupils to move on to more advanced material.

The big 5 Ideas of Mastery can be seen in this representation:



A true understanding of these ideas will come about only after discussion with other teachers and by exploring how the ideas are reflected in day-to-day maths teaching, as follows:



Coherence

Lessons are broken down into small connected steps that gradually unfold the concepts, providing access for all children and leading to a generalisation of the concepts and the ability to apply the concepts to a range of contexts.

Representation and Structure

Representations used in lessons expose the mathematical structure being taught, the aim being that students can do the maths without recourse to the representation

Mathematical Thinking

If taught ideas are to be understood deeply, they must not merely be passively received but must be worked on by the student: thought about, reasoned with and discussed with others

Fluency

Quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics

Variation

Variation is twofold. It is firstly about how the teacher represents the concept being taught, often in more than one way, to draw attention to critical aspects, and to develop deep and holistic understanding. It is also about the sequencing of the episodes, activities and exercises used within a lesson and follow up practice, paying attention to what is kept the same and what changes, to connect the mathematics and draw attention to mathematical relationships and structure.

Continuity and Progression

Early Years Foundation Stage

The first few years of a child's life are especially important for mathematics development. Research shows that early mathematical knowledge predicts later reading ability and general education and social progress. Conversely, children who start behind in mathematics tend to stay behind throughout their whole educational journey.



The objective for those working in Early Years, then, is to ensure that all children develop firm mathematical foundations in a way that is engaging, and appropriate for their age. There is a clear progression of mathematical understanding from Nursery to Reception.

The EYFS Framework states:

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently beyond 20, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

There are six key areas of early mathematics learning, which collectively provide a platform for everything children will encounter as they progress through their maths learning at primary school, and beyond.

Cardinality and Counting

Understanding that the cardinal value of a number refers to the quantity, or 'how many ness' of things it represents.

Comparison

Understanding that comparing numbers involves knowing which numbers are worth more or less than each other.

Composition

Understanding that one number can be made up from (composed from) two or more smaller numbers.

Pattern

Looking for and finding patterns helps children notice and understand mathematical relationships.

Shape and Space



Understanding what happens when shapes move, or combine with other shapes, helps develop wider mathematical thinking.

Measures

Comparing different aspects such as length, weight and volume, as a preliminary to using units to compare later.

Mathematics in the EYFS includes both numbers and shape, space and measure.

Numbers

Young children begin to make the link between numerals and quantity, counting and knowing how many items are in a group and learning how to use simple calculation skills in practical, real-life situations. Opportunities to explore, practise and build on mathematical learning should be provided outside and inside, in all areas of provision, in child and adult initiated activity, at song time, story time and snack time – all the time.

The most valuable resources for mathematical learning are the adults who share children's excitement as they learn. A knowledgeable practitioner creates exciting opportunities for children to practise their skills, offering suggestions and ideas to extend their thinking and broaden and deepen their understanding.

Shape, space and measure

As young children try to make sense of the world around them, they make links and connections between what they see in their environment and their past experience. Through this process, they begin to notice and understand the properties of shapes, for example knowing that a ball will roll.

Children also become aware of variations in size and space and they begin to apply this knowledge to negotiate space, solve problems and understand more about the world. They also begin to notice patterns and this helps them to develop skills in sequencing, ordering and time.

When given appropriate support, their vocabulary will reflect their growing knowledge and will enable them to express their ideas and thoughts.

The Maths National Curriculum

The national curriculum for mathematics aims to ensure that all pupils:



♣ become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.

♣ reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language

♣ can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

Key Stage 1

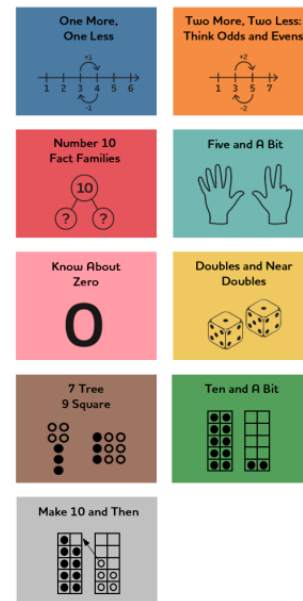
The principal focus of mathematics teaching in Key Stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources (for example, concrete objects and measuring tools).

At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

By the end of Year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency. As the graphic shows below, EYFS and KS1 will cover the following calculation skills. The bold outlined section in the middle of the table outlines the fluency facts for Year 2 and all other cells in the table will be covered in Reception and Year 1. The colours correspond with the strategies as shown in the key to the right.



+	0	1	2	3	4	5	6	7	8	9	10
0	0+0	0+1	0+2	0+3	0+4	0+5	0+6	0+7	0+8	0+9	0+10
1	1+0	1+1	1+2	1+3	1+4	1+5	1+6	1+7	1+8	1+9	1+10
2	2+0	2+1	2+2	2+3	2+4	2+5	2+6	2+7	2+8	2+9	2+10
3	3+0	3+1	3+2	3+3	3+4	3+5	3+6	3+7	3+8	3+9	3+10
4	4+0	4+1	4+2	4+3	4+4	4+5	4+6	4+7	4+8	4+9	4+10
5	5+0	5+1	5+2	5+3	5+4	5+5	5+6	5+7	5+8	5+9	5+10
6	6+0	6+1	6+2	6+3	6+4	6+5	6+6	6+7	6+8	6+9	6+10
7	7+0	7+1	7+2	7+3	7+4	7+5	7+6	7+7	7+8	7+9	7+10
8	8+0	8+1	8+2	8+3	8+4	8+5	8+6	8+7	8+8	8+9	8+10
9	9+0	9+1	9+2	9+3	9+4	9+5	9+6	9+7	9+8	9+9	9+10
10	10+0	10+1	10+2	10+3	10+4	10+5	10+6	10+7	10+8	10+9	10+10



Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at Key Stage 1.

There are at least four pieces of maths work in each child's book per week in Year 2. In addition, there are regular opportunities for mental arithmetic throughout each half term, focusing on mental strategies, discussion, use of language stems to develop maths oracy and written arithmetic questions.

Integrated Learning in Y1

Young children need to learn in a fun, hands on and meaningful way which gives them a love of learning. Integrated Learning is an approach to teaching and learning that builds upon the EYFS Principles of learning through play and creating independent learners. It provides a rich learning experience for children who might not yet be ready for formal, simultaneous learning in KS1, whilst focusing on embedding independence and thereby ensures children are developmentally ready for 'formal' learning.

Expectations for books

Guided teacher lead sessions mean children get the opportunity to do maths with their teacher in a small group once per week. This process can and should be mirrored by the additional adults, but they could also be used to oversee independent sessions to allow teachers to work with their groups. When children are not working in a small group with their teacher or additional adult, there will be a range of opportunities to develop mathematical understanding through independent activities. There are at least two pieces of guided maths work in each child's book per week, plus independent work that can be stuck into their maths books or added to a folder. In addition, there are continuous maths opportunities in the learning environment for children to explore and consolidate their understanding.



Key Stage Two

The principal focus of mathematics teaching in Lower Key Stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.

At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.

By the end of Year 4, pupils should have memorised their multiplication tables up to and including the 12-multiplication table and show precision and fluency in their work. In Year 4, children undertake the Multiplication and Times table Check (MTC). See below,.

Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

There are at least four pieces of maths work in each child's book per week. Regular opportunities for arithmetic take place throughout each half term, focusing on mental strategies, discussion, use of language stems to develop maths oracy and written arithmetic test papers.

The Learning Environment

All classrooms have well-stocked maths resources to support children with their learning. The learning environment should also promote reading in an engaging way.

A maths working wall is present in each classroom displaying modelled work from for the unit being taught, as well as children's work and key vocabulary or concepts. Each classroom has accessible resources to support the teaching and learning of maths, including ten frames, double-sided counters, base 10, counters and numicon. In EYFS pupils have access to a wealth of visual vocabulary ranging from numbers, labels, lists and interactive activities.

Interventions

As a Federation we aim to provide timely interventions in order to avoid growing misconceptions in a pupil's learning and keeping the whole class together. Interventions are designed to increase pupils' mathematics attainment across all age groups and



provide targeted support so that all pupils attain a given level of mathematics understanding.

The role of parents and carers

The regular practice of times tables and number bonds at home with your child makes a huge difference to your child's fluency. We expect children in EYFS/KS1 to be practising key maths skills at home daily. Pupil's fluency and number skills will progress to Times Tables and related facts in KS2. The school's online maths subscriptions greatly support this. The knowledge of the number bonds multiplication tables helps children solve problems quickly and flexibly, and allows them to tackle more complex mathematics in their academic life. We will ask parents and carers to support the children's home learning in Maths. Parents and carers will receive a summary of the Maths learning and expectations in each year group.

Assessment and recording

Assessment is used to inform the planning and the teaching of Maths. This takes various forms:

Key learning objectives for Maths are identified from the National Curriculum and are translated into learning outcomes. Pupils' progress is assessed and tracked throughout the year, with three key moderation points which are followed by Year Group Pupil Progress Meetings.

Teachers are responsible for assessing the progress of all pupils in their class. Progress can be assessed through pupils' daily work, ongoing summative assessment and regular assessment.

Teachers are responsible for giving feedback to move children forward. Please the school marking policy.

SATS (Standard Assessment Tests) are given at the end of Year 2 and 6. They are used to show children's progress in Maths. In KS1 the tests are more informal, and the results are used to back up teacher assessment, while in KS2 the tests are more formal and papers are sent away for external marking.

Calculation Policy

The calculation policy (see calculations policy on website) has been updated to reflect the Mastery approach to teaching and the use of White Rose Maths resources.

Y4 Multiplication Timestables Check



The purpose of the MTC is to determine whether pupils can recall their times tables fluently, which is essential for future success in mathematics. It will help to identify areas in which children may need additional support and those who have not yet mastered their times tables, so that additional support can be provided.

Pupils in Year 4 will have opportunities to practise for the MTC in school and teachers will track the attainment and progress of their pupils, providing interventions where needed. It is an on-screen check consisting of 25 times table questions. There will be 6 seconds to answer each question and on average, the check should take no longer than 5 minutes to complete.

In the table below are the National Curriculum times tables end of year expectations for each year group. Children regularly work on their times tables in school but it is important for them to practice at home too.

Year 1	Count in multiples of 2, 5 and 10. Recall and use doubles of all numbers to 10 and corresponding halves.
Year 2	Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers.
Year 3	Recall and use the multiplication and division facts for the 3, 4, 6 and 8 multiplication tables.
Year 4	Recall and use multiplication and division facts for multiplication tables up to 12 x 12.
Year 5	Revision of all multiplication and division facts up to 12 x 12.
Year 6	Revision of all multiplication and division facts up to 12 x 12.

Laura Smith, Joel Power and Matthew Swarbrick - Federation Maths Leads



Appendix - End of year National Curriculum Expectations

Arithmetic Objectives

Year 1

- form numbers from 1- 20 correctly
- represent and use number bonds and related subtraction facts within 20
- add and subtract one-digit and two-digit numbers to 20, including zero read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs
- count in multiples of twos, fives and tens
- recognise, find and name a half as one of two equal parts of an object, shape or quantity
- recognise, find and name a quarter as one of four equal parts of an object, shape or quantity



Arithmetic Objectives

Year 2

- recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
 - add and subtract numbers using concrete objects, pictorial representations, and mentally, including:
 - a two-digit number and ones
 - a two-digit number and tens
 - two two-digit numbers
- adding three one-digit numbers
- show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
- recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.
- count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward
- recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot

recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity



Arithmetic Objectives

Year 3

- add and subtract numbers mentally, including:
 - a three-digit number and ones
 - a three-digit number and tens
 - a three-digit number and hundreds
- add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction
- estimate the answer to a calculation and use inverse operations to check answers
- count from 0 in multiples of 4, 8, 50 and 100
- recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
- recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators
- recognise that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10
- recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators
- compare and order unit fractions, and fractions with the same denominators



Arithmetic Objectives

Year 4

- add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate
- estimate and use inverse operations to check answers to a calculation
- count in multiples of 6, 7, 9, 25 and 1 000
- recall multiplication and division facts for multiplication tables up to 12×12
- use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers
- recognise and use factor pairs and commutativity in mental calculations
- round any number to the nearest whole number 10, 100 or 1 000
- recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten



Arithmetic Objectives

Year 5

- add and subtract numbers mentally with increasingly large numbers
- add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
- use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- count forwards or backwards in steps of powers of 10 for any given number up to
 - 1 000 000
- multiply and divide numbers mentally drawing upon known facts
- multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
- round any number and decimals with two decimal up to 1 000 000 to the nearest 10, 100, 1 000, 10 000 and 100 000 and to one decimal place.
- recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
- compare and order fractions whose denominators are all multiples of the same number



Arithmetic Objectives

Year 6

- perform mental calculations, including with mixed operations and large numbers
- use their knowledge of the order of operations to carry out calculations involving the four operations
- use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy
- associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$)
 - round any whole number to a required degree of accuracy
 - compare and order fractions, including fractions >1
 - add and subtract fractions with different denominators, including mixed numbers
 - multiply fractions
 - divide a fraction by a whole number
 - calculate percentages of amounts