



Wordsworth Primary School

Maths Policy



Approved by: Julie-Anne Palfrey, Headteacher

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At Wordsworth Primary School we aspire to ensure that our mathematics curriculum ‘equips pupils with the knowledge they need to succeed in life’. Ofsted September, 2019.

‘The responsibility of mathematics education is to enable all pupils to develop conceptual understanding of the mathematics they learn, its structures and relationship, and fluent recall of mathematical knowledge and skills to equip them to solve familiar problems as well as tackling creatively the more complex and unfamiliar ones that lie ahead.’ Page 6 Mathematics: made to measure May 2012.

‘Teachers should use every relevant subject to develop pupils’ mathematical fluency. Confidence in numeracy and other mathematical skills is a precondition of success across the national curriculum.’ Page 9 NC 2014

How we teach Maths at Wordsworth Primary School

At Wordsworth, the maths curriculum is designed so that children develop a strong understanding of key mathematical concepts which builds on prior learning as they progress through the school. We teach maths through a process of modelling, guided practice and applying, using a variety of concrete and pictorial representations to support a conceptual understanding of the subject.

Children will be taught to make independent use of concrete and pictorial resources to support their understanding, and to use mathematical vocabulary to explain their thinking. Problem solving skills are clearly modelled and taught to enable children to tackle problems independently.

The Maths Curriculum

Our school follows the National Curriculum 2014 and the programmes of study set therein for each year group.

- Our planning is informed, but not dictated, by the White Rose Maths scheme for learning. Teachers can use or adapt activities for fluency, reasoning and problem solving within each learning journey.
- Our planning is also supported by the National College for the Excellence in the Teaching of Mathematics (NCETM), NRICH and Deepening Understanding.

Our Principles of Teaching

- Explicit modelling of skills and knowledge
- Use of concrete, pictorial and abstract representations of number
- Teaching of key mathematical vocabulary
- A high level of mathematical dialogue between teachers and pupils
- Scaffolds to support children’s understanding
- A progression in conceptual understanding as children move through the school

Fluency, Reasoning and Problem Solving

These are three key areas required to gain a deep mathematical understanding. 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.

Planning for Maths Lessons

Planning for maths should follow the National Curriculum programmes of study for each year group and long-term overviews suggested by White Rose Maths. Teachers should use the agreed format of planning across the school to outline the small steps needed to enable the children to reach the intended learning outcome. The learning will be progressive and ensure children are taught the skills, knowledge and understanding needed over the unit so that by the end of the unit good progress is evident.

Planning should not be over detailed or bureaucratic. The intention of planning at Wordsworth is to provide a structure of small learning steps and set out the appropriate teaching points and vocabulary to support this learning. Rather than adding detail to plans, more time should be used discussing the steps, teaching points and key vocabulary between teachers and supporting adults. Adults should discuss:

- the desired endpoint of the learning
- any barriers or misconceptions that exist in the current understanding
- what concrete and pictorial resources will be used and how they will be used
- the key vocabulary and sentence stems
- how to stretch and challenge more confident children

The planning process must have a sequence of inputs to teach the children the key skills they will need to access the age related mathematical problems independently. The teaching sequence should involve concrete, pictorial and abstract methods of calculations (as appropriate) or mathematical skill to aid conceptual understanding of the objective. All inputs will require an 'I do, you do' model, where the teacher models the skill and then the children would have the opportunity to practise the skill. Once a child has shown they are proficient in using this skill, they would then have the opportunity to practise this skill in a range of ways.

Talk for Maths is essential to our pupils developing a secure mathematical understanding, and it will support their ability to reason and understand links between different mathematical concepts. Teachers should plan for frequent opportunities for pupils to discuss their maths learning with their peers, and for them to prepare and rehearse their reasoning explanations.

All steps in the learning journey should allow all children to become fluent, reason effectively and solve problems that are appropriate to their next steps. These statements do not reflect the learning journey. It is expected that all children will have opportunities to reason and problem solve at their level.

Concrete, Pictorial and Abstract Representations

Concrete representations are essential for children to develop conceptual understanding of their mathematics. Concrete representations are always used to support introducing new concepts and to support extending prior learning. All children should participate in concrete activities in order to support their conceptual understanding. We do not need to take photos of children using concrete resources and stick these in books; this is evidenced in planning.

Pictorial representations are the next essential step in conceptual understanding of mathematics. They enable children to explain and prove their own ideas. All children should participate in pictorial activities in order to support their conceptual understanding. Children should be taught how to draw their own pictorial representations, as well as to interpret given examples.

When children are confident with their understanding whilst using concrete and pictorial representations, they can then move on to abstract representations of the same concept. Abstract representations do not always equate to formal written methods; they can also include other strategies including bar models, part-whole models and mental calculation. Children who still need concrete and pictorial representations should continue to use them, and children who have mastered the abstract method should be moved on to more challenging tasks.

Retrieval Practice

All year groups in KS1 and KS2 use 'Flashback 4' on a daily basis to practise the retrieval of previously taught material. Flashback 4 should be completed independently in the front of maths books at the start of each lesson. Children should be encouraged to recall strategies they have been taught and use these to solve fluency and problem solving questions in a variety of contexts.

Mental Maths

Mental maths strategies are an essential component of developing mathematical fluency in a range of concepts. The required skills for each year group are detailed in the mental maths overview. Children should be taught and given the opportunity to practise these skills at relevant points during maths lessons throughout the year. The school planning format includes a linked mental maths activity for each small step. This should take place as part of the teaching for that small step.

Mastering Number

The Mastering Number programme aims to secure firm foundations in the development of good number sense for all children from Reception through to Year 1 and Year 2. The aim over time is that children will leave KS1 with fluency in calculation and a confidence and flexibility with number. Attention will be given to key knowledge and understanding needed in Reception classes, and progression through KS1 to support success in the future.

- Children will be able to clearly communicate their mathematical ideas
- Teachers will develop a secure understanding of how to build firm mathematical foundations
- Teachers will demonstrate intentional teaching strategies focused on developing fluency in calculation and number sense for all children
- Teachers will use appropriate manipulatives to support children's understanding of mathematical structures

Mathematics in EYFS

At Wordsworth, we believe that Mathematics should be firmly embedded into the curriculum through a mixture of child led, 'Discovery Time' opportunities and through adult led activities to support the maths curriculum. As a school, we believe that all children can and should achieve in maths and therefore teach to develop a secure and deep early understanding that lay the foundations of excellent mathematical enquiry and reasoning.

Children will develop a deep understanding of numbers to 10 through the use of NCTEM resources alongside White Rose maths, which they then take into the rich and creative environment that Wordsworth has to offer. They will be given opportunities to explore other key areas of maths including exploring shapes, patterns and measuring, which ensures they have access to a well-rounded curriculum. Children are able to play with what they know, discuss their ideas, experiment, be exposed to a wide range of supporting resources and are always given the opportunity to explain, ask questions and build on prior knowledge.

Inclusion in mathematics

Children whose progress in maths is identified as slow at pupil progress meetings have a range of strategies put in place to accelerate progress. Changes to the 'Quality First Teaching' are made with a focus on these children. Teachers should use QFT to diminish the gap to year group expectation rapidly. Teachers should use their professional judgement to identify which steps are essential in order to achieve this and ensure the difference to

age-related expectation is diminished rapidly. Interventions may be planned in over and above QFT to support gaps in learning.

Certain children, who have been identified by the SENCO, will require their own learning journey. This must still follow the mathematics principles of the school and must be consistent for these children.

Assessment in Mathematics

Teachers will build in opportunities for independent tasks covering a range of content domains/KPIs which can be used for teacher assessment. These will include, but are not limited to, the 'Prove It' task at the end of each unit.

At the end of each term in Y2-6 each child completes an NTS assessment in Mathematics. These are then used by teachers to identify gaps and inform planning for the next term.

As part of our school assessment cycle there are opportunities to moderate evidence in order to validate teacher judgements both in school and across the JEP trust. Year teams also carry out more regular informal moderations in the lead up to data entry points at the end of each term. The National Curriculum and Hamwic KPIs are used to make judgements.

Evidence used for teacher assessments and moderation must be independent.

Appendix 1 – Times Tables

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 multiplication and division facts for the 3, 4 and 8 multiplication tables
- use place value, known and derived facts to multiply and divide mentally

Year 4

- recall multiplication and division facts for multiplication tables up to 12×12
- multiply and divide whole numbers by 10, 100, 1000
- use place value, known and derived facts to multiply and divide mentally, including multiplying by 0 and 1; dividing by 1; and multiplying three numbers together

Year 5 & 6

- recall multiplication and division facts for multiplication tables up to 12×12
- identify multiples and factors, including finding all factor pairs of a number and finding common factors of 2 numbers
- know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers
- Recognise and use square and cube numbers
- multiply and divide numbers involving decimals by 10, 100, 1000
- multiply and divide numbers mentally, drawing upon known facts e. $7 \times 6 = 56$ therefore $8 \times 700 = 5600$

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 2	2s	5s	10s	All	All	All
Year 3	2s, 5s, 10s	3s	4s	8s	All	All
Year 4	2s, 5s, 10s, 3s, 4s, 8s	6s, 9s, 12s	7s, 11s	All	All	All
Year 5 & 6	2s, 5s, 10s & Related Facts	3s, 6s, 12s & Related Facts	4s, 8s & Related Facts	7s, 9s, 11s & Related Facts	All & Related Facts	All & Related Facts

Teaching

It is essential that times tables are explicitly taught as a method of mental calculation for multiplication AND division. This must include specific whole-class teaching of individual times tables, alongside regular practice of those tables that have already been taught.




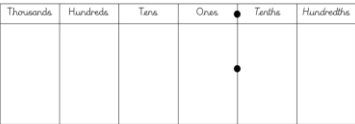
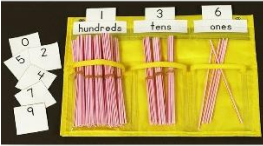




- * Explicit teaching of each times table for your year group BEFORE any written multiplication methods teaching.
- * Written multiplication should focus mainly on the times tables for year group and the previous ones (not the next year group times tables).
- * There should be no whole class teaching/practising of any times tables that are beyond your year group.
- * Explicitly use mathematical language related to multiplication and division, eg. Factors, multiples, product, divisor, dividend, quotient





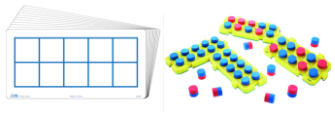

Practising

Practice is important to ensure that previously taught times tables are remembered and embedded. On a regular basis, you should be practising times tables from previous year groups, as well as any tables you have already taught in your year group.

Practise should continue to expose children to times tables in a variety of different representations, not just purely reeling off a list of numbers in that times table. This will help to improve confidence with times tables, and speed of application, both of which are important for the multiplication check at the end of Year 4 and end of key stage testing.

Appendix 2 – Concrete Resources

Place value counters (including decimals and fractions) All Classes 	Counting equipment (matchsticks, counters, animals etc) KS1 and LKS2 	Base ten equipment (e.g. dienes) All Classes 
Place value arrow cards  All Classes	Geoboards  All Classes	Cuisenaire rods  All Classes
Place value grids  All Classes	Straws (grouping, sharing, counting, base ten applications, geometry)  All Classes	Laminated part whole model cards  All Classes
Digit cards  All Classes	Egg boxes (division, grouping, fractions, alternative tens frames...)  KS1 and LKS2	Playing cards  All Classes
Number lines – structured and blank  All Classes	Clothes pegs  KS1 and LKS2	Dice  All Classes

Multilink / unifix cubes  All Classes	Bead strings  KS1 and LKS2	Number shapes (e.g Numicon)  All Classes
Fraction tiles / foam fraction bars  Year 2 upwards	Tens frames (laminated cards or plastic / foam framed)  KS1 and LKS2	Dominoes  KS1 and LKS2