

Effective understanding and recall of times tables is the foundation of most of the maths children will do at Overstone Combined School, and the curriculum puts an emphasis on knowing them at an early stage.

Overstone has always put tremendous effort and resources into getting children to have instant recall of their multiplication table facts. Being fluent in calculation and knowing multiplication tables by heart are a maths essential. Knowing the multiplication tables (and their associated division facts) supports mathematical learning and understanding. Those children who have a strong grasp of them tend to be more self-assured when learning new concepts.

Every child will work towards obtaining their multiplication tables certificates, and will be able to work through at their pace. If, however, a child feels like they have prepared enough for the next certificate, then there is nothing stopping them from trying to earn it, we would encourage this willingness to learn!

The real secret to learning multiplication tables and getting them to 'stick' comes through hard work, but work filled with special ingredients: jokes, giggles, movement, puzzles, music games, team work and novelty. If we can fill multiplication tables with fun, curiosity, surprises and memories then we are giving children every chance of growing maths muscles that can answer 7 x 8 without dissolving into tears.

Our aim is that for every pupil moving on from Overstone Combined School, will hold a fluent, accessible and automatic knowledge of their multiplication tables.

Mrs. F Willett Maths Lead

March 2022



Pupils should learn the multiplication tables in the 'families' described below – making connections between multiplication tables in each family will enable pupils to develop automatic recall more easily, and provide a deeper understanding of multiplication and division. Pupils regularly work on their multiplication tables in school but it is important for them to practice at home too.

EYFS	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, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers.
Year 1	Counting in 2s, 5s and 10s, from different multiples, and to develop their recognition of patterns in the number system and make connections using arrays.
Year 2	Count in steps of 2, 3, 5 & 10s from 0, and in 10s from any number, forward and backward in multiples. Counting in multiples of 3 to support a later understanding of a third.
Year 3	Pupils will continue to practise and recall multiples of 2, 3, 4, 5, 8, 10, 50 & 100.
Year 4	Pupils will continue to practise recalling and using multiplication tables and related division facts to aid fluency. They will recall multiplication and division facts for multiplication tables up to 12 × 12.
Year 5	Identify multiples and factors, and to continue to practise to multiply and divide numbers mentally, drawing upon known facts from all tables.
Year 6	Pupils continue to use all the multiplication tables to calculate mathematical statements in order to main fluency. The connections and patterns will help pupils to develop fluency and understanding.

Multiplication and division facts

The full set of multiplication calculations that pupils need to be able to solve by automatic recall are shown in the table below. Pupils must also have automatic recall of the corresponding division facts.

1 × 1	1 × 2	1 × 3	1 × 4	1 × 5	1×6	1 × 7	1 × 8	1 × 9	1 × 10	1 × 11	1 × 12
2 × 1	2 × 2	2 × 3	2 × 4	2 × 5	2 × 6	2 × 7	2 × 8	2×9	2 × 10	2 × 11	2 × 12
3 × 1	3 × 2	3 × 3	3 × 4	3 × 5	3 × 6	3 × 7	3 × 8	3 × 9	3 × 10	3 × 11	3 × 12
4 × 1	4 × 2	4 × 3	4 × 4	4 × 5	4 × 6	4 × 7	4 × 8	4 × 9	4 × 10	4 × 11	4 × 12
5 × 1	5 × 2	5 × 3	5 × 4	5 × 5	5×6	5 × 7	5 × 8	5×9	5 × 10	5 × 11	5 × 12
6 × 1	6 × 2	6 × 3	6 × 4	6 × 5	6×6	6 × 7	6 × 8	6×9	6 × 10	6 × 11	6 × 12
7 × 1	7 × 2	7 × 3	7 × 4	7×5	7×6	7 × 7	7 × 8	7×9	7 × 10	7 × 11	7 × 12
8 × 1	8 × 2	8 × 3	8 × 4	8 × 5	8×6	8 × 7	8 × 8	8 × 9	8 × 10	8 × 11	8 × 12
9×1	9×2	9×3	9×4	9×5	9×6	9×7	9×8	9×9	9 × 10	9 × 11	9 × 12
10 × 1	10 × 2	10 × 3	10 × 4	10 × 5	10 × 6	10 × 7	10 × 8	10 × 9	10 × 10	10 × 11	10 × 12
11 × 1	11 × 2	11 × 3	11 × 4	11 × 5	11 × 6	11 × 7	11 × 8	11 × 9	11 × 10	11 × 11	11 × 12
12 × 1	12 × 2	12 × 3	12 × 4	12 × 5	12 × 6	12 × 7	12 × 8	12 × 9	12 × 10	12 × 11	12 × 12

Pupils must be fluent in these facts by the end of year 4, and this is assessed in the multiplication tables check. Pupils should continue with regular practice through year 5 to secure and maintain fluency.

The 36 most important facts are highlighted in the table. Fluency in these facts should be prioritised because, when coupled with an understanding of commutativity and fluency in the formal written method for multiplication, they enable pupils to multiply any pair of numbers.

In order to help children to understand that multiplication and division represents real-life situations, the teaching of multiplication tables in KS1 and lower KS2 will use concrete and pictorial methods, such as asking them to spilt groups of objects into a number of equal groups and find the total of groups of objects.





As a whole school we ensure that progression in mathematical concepts starts from the very beginning and will frequently use practical equipment to support the children's learning of new concepts. Using practical activities and equipment gives our young children materials to manipulate, aid their understanding and lay the foundations for visual images that represent numbers.

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, 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.

The Early Learning Goals describe skills the children are expected to have rather than knowledge and so these can be covered through many different themes or topics. There are some general themes, which are covered each term. Skills are mapped out into terms as a general guide, but many will be taught on an individual or group basis when appropriate for each child, depending on their stage of development.

	Getting to Know	lt's Me 1 2	Light and Dark	Alive in 5!	Growing	Building 9 &	To 20 and	First Then	Find my	On the Move
	You	3!			6,7,8	10	Beyond	Now	Pattern	
Maths (White Rose)	Just Like Me! Match and Sort Compare Amounts Compare Size, Mass & Capacity Exploring Pattern 	 Representing, comparing and composition of 1,2,3. Circles and Triangles Positional Language 	 Representing Numbers to 5 One More and Less Shapes with 4 Sides Time 	 Introducing zero Comparing numbers to 5 Composition of 4 and 5 Compare Mass Compare Capacity 	 6,7,8 Combining 2 amounts Making pairs Length and height Time 	 Counting to 9 and 10 Comparing numbers to 10 3d-shapes Spatial Awareness Patterns 	 Building Numbers Beyond 10 Counting Patterns Beyond 10 Spatial Reasoning- Match, Rotate, Manipulate 	 Adding More Taking Away Spatial Reasoning- Compose and Decompose 	 Doubling Sharing and Grouping Even and Odd Spatial Reasonin B⁻ Visualise and Build 	 Deepening Understandin g Patterns and Relationships Spatial Reasoning- Mapping

Reception Maths overview



Skills taught:

- To have a deep understanding of number to 10, including the composition of each number
- Subitise (recognise quantities without counting) up to 5
- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.
- Verbally count beyond 20, recognising the pattern of the counting system
- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity
- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

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.

Suitable websites:

https://nrich.maths.org/early-years https://www.bbc.co.uk/cbeebies/shows/numberblocks





At Overstone we use the CPA approach (Concrete-Pictorial-Abstract) approach to underpin knowledge, understanding and skills. This involves giving children a better chance of creating a long-term memory, based on manipulation of physical resources and constructing images before or alongside the abstract e.g. the facts written as numbers: $1 \times 2 = 2$.

The children practise counting by reciting numbers and counting objects. They are taught to count in 2s, 5s and 10s, from different multiples, to develop their recognition of patterns in the number system, e.g. odd and even numbers.

The children will use apparatus for developing the concept of multiplication:

- A variety of real objects to sort and count, e.g. counters, beans, shells
- Interlocking cubes, e.g. multilink
- Cuisenaire rods
- Base-10 equipment, e.g. Diennes
- Number lines and grids (marked and unmarked)
- Washing lines and 0-100 number cards with pegs
- Money
- Pegboards and pegs
- Pictures
- Arrays
- Multiplication number grids (for number sequences and pattern spotting

Skills taught:

- Pupils must be able to count in multiples of 2, 5 and 10 by the end of year 1 so that they are ready to progress to multiplication involving groups of 2, 5 and 10 in year 2
- Count, read and write numbers to 100 in numerals
- Basic one-step problems x/÷
- Recognise Place Value
- Recall and identify multiples of 2, 5 and 10 tables.
- Carry out repeated addition and multiplication of 2, 5, and 10, and divide by 2, 5 and 10
- Unitise in tens.
- Count forwards and backwards in multiples of 2, 5 and 10, up to 10 multiples, beginning with any multiple and count forwards and backwards through the odd numbers.

Suitable websites:

https://www.topmarks.co.uk/maths-games/5-7-years/times-tables https://www.bbc.co.uk/teach/supermovers/times-table-collection/z4vv6v4 https://www.bbc.co.uk/cbeebies/shows/numberblocks





Year 2 is when children start to build their knowledge of multiplication tables. They practise to become fluent in the 2, 3, 5 & 10 multiplication tables, and connect them to each other. Counting in multiples of 3 to support a later understanding of a third.

Once the child has a good understanding of the 2s multiplication table, they move on to the 5s multiplication table and then the 10s multiplication table. The 10s multiplication table follows similar rules to the 5s multiplication table, so learning them in this order will help build the child's understanding of number-relationships more generally.

The process of learning tables should begin with children building up a table using concrete apparatus, moving on to a pictorial representation, then symbolising the two types of table (e.g. $1 \times 2 = 2$, $2 \times 1 = 2$) and then practising the tables both in written and oral forms.

Tip: focus on the easy facts (x0, x1, x2, x3, x5, x10) and build on these. Starting with the easy facts for 1,2,10 and 5 emphasises how useful doubling and halving can be.

The children begin to use other multiplication tables and recall multiplication facts including using related division facts to perform written and mental calculations. Using the suggested hand-on resources below, the children will make connection when learning their multiplication tables.

- listening and singing to times tables songs
- playing games like Fizz Buzz, Tables Bingo etc.
- playing multiplication and division 'Snap' type games
- using flash cards with missing numbers
- playing with loop cards
- using dice games
- playing cards, dominoes and darts
- using graphing tables
- interacting with Venn and Carroll diagrams
- using jog your memory cards
- fun mnemonics, e.g. use phrases which sound like numbers (sticky floor = 64, plenty more = 24 etc)
- promoting 'Personal Best' multiplication timed races





Working with a range of materials and contexts, in which multiplication and division relate to groups and sharing discrete and continuous quantities, to arrays and repeated addition. The children will use commutativity and inverse relations to develop multiplicative reasoning e.g. $4 \times 5 = 20$ and $20 \div 5 = 4$.

Skills taught:

- Count in multiples of 2, 3, 5 and 10 to find how many groups of 2, 3, 5 or 10 there are in a particular quantity,
- set in everyday contexts
- Place Value
- Basic one step problems $x/\div e.g. 4 \times 5 = 20$ $20\div 5 = 4$
- Mental fluency of 4 operations
- Arrays and number patterns
- Recognise repeated addition contexts, representing them with multiplication equations and calculating
- the product, within the 2, 3, 5 and 10 multiplication tables
- Use multiplication to represent repeated addition contexts for other group sizes.
- Moving onto memorising multiplication tables
- Pupils need to be able to represent 4 fives (or 5, 4 times) as both 4 x 5× and 5 x 4. They should be able to use commutativity to solve e.g. 2 fives, using their knowledge of 5 twos.

It is important that as well as practicing in class, children must have time to practice them at home using recommended websites.

Suitable websites:

https://www.topmarks.co.uk/maths-games/5-7-years/times-tables https://www.bbc.co.uk/teach/supermovers/times-table-collection/z4vv6v4 https://www.timestables.co.uk https://ttrockstars.com/





With lots of multiplication tables to learn in Year 3, learning them in a specific order can really help. The children will learn to recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 3, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number.

Once the child is comfortable with multiples of 3, introduce the 6 and 9 multiplication tables. To find 4 x 3, for example, they can work out 2 x 3 and double the answer. Ensure to highlight helpful number rules as they learn these multiplications. For example, if they were to double an answer from the 3-multiplication tables, they would have an equivalent answer for the 6-multiplication tables. The 4s multiplication table is a great place to begin, as the number rules the child will have picked up from the 2s multiplication table will come into play. The factors can be written in either order and the product remains the same, for example, we can write $3 \times 4 = 12$ or $4 \times 3 = 12$ to represent the third fact in the 4-multiplication tables.

To develop number sense and times table proficiency, children need to be able to 'see' the maths in different representations, and have the language to describe their own thinking. Mental image activities encourage this, which include children closing their eyes and mentally moving groups of objects or small arrays of dots. Number lines and grids can be imagined and movements and patterns on them described.

Precision in the use of language is important, if we are to reach shared understandings, we need to make sure that children know the right vocabulary to use when talking about multiplication. As well as practicing in class, children must have time to practice them at home using recommended websites.

Skills taught:

- Learning facts in the 10, 5, 2, 3, 4 and 8 multiplication tables
- To develop multiplication reasoning
- Recognise repeated addition contexts and represent them with multiplication equations
- Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor, and to division equations (quotative division)
- Commutativity & inverse x/÷
- Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 3, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number
- Use multiplication facts during application of formal written layout
- Pupils should be able to explain that numbers such as 180 and 300 are multiples of 10, because they are each equal to a whole number of tens
- Learning to identify the number of tens in three-digit multiples of 10 should be connected to pupils understanding of multiplication and the grouping structure of division
- To identify which pair of multiples of 100 or 10 a given three-digit number is between



- Pupils should practise counting in multiples of 10, 20, 25, and 50 from 0, or from any multiple of these numbers, both forwards and backwards
- Pupils will have been practising counting in multiples of 1, 2 and 5 since year 1, and this supports counting in units of 10, 20 and 50
- Pupils should also be able to write and solve multiplication and division equations related to multiples of 10, 20, 25 and 50 up to 100.

Suitable websites:

https://www.mathsisfun.com/tables.html https://www.timestables.co.uk https://ttrockstars.com/ https://www.topmarks.co.uk/maths-games/7-11-years/times-tables https://www.bbc.co.uk/teach/supermovers/times-table-collection/z4vv6v4 https://www.youtube.com/watch?v=dzVyBQ5uTbo https://www.youtube.com/watch?v=8QU_E0u-tP4





By Year 4, the children will need to be able to recall multiplication and division facts for multiplication tables up to 12 × 12. Pupils will continue to practise their mental recall of multiplication statements in order to improve fluency.

The 6s multiplication is double the 3s multiplication table. The 9s multiplication table can be related to the 10s by subtracting from 10, such as 7x9 = 7x10 - 7. Strategies using fingers and the sum of the digits of multiples of 9 will also help in learning the multiples of 9. Although multiplication tables over 10 may seem daunting, fear not! The 10s multiplication tables are easy to memorise and uses the 5s multiplication table through halving. Continue with the 11s multiplication tables, and then move on to the 12s multiplication tables. Armed with their other multiplication tables and having learned them in order, reassure pupils that they in the final stretch to becoming multiplication wizards!

When pupils commit multiplication table facts to memory, they do so by using a verbal sound pattern to associate the 3 relevant numbers, for example, "nine sevens are sixty-three". It is important to provide opportunities for pupils to verbalise each multiplication fact as part of the process of developing fluency.

Recall of all multiplication table facts should be the main multiplication calculation focus in year 4. Pupils who leave year 4 fluent in these facts have the best chance of mastering short multiplication in year 5. Pupils who are fluent in multiplication table facts can solve the following types of problem by automatic recall of the relevant fact rather than by skip counting or reciting the relevant multiplication table.

Multiplication Tables Check – end of year 4

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 schools to identify pupils who have not yet mastered their times tables, so that additional support can be provided. Schools will have a 3-week check window in June to administer the MTC. Teachers will have the flexibility to administer the check to individual pupils, small groups or a whole class at the same time.

MTC websites:

https://www.timestables.co.uk/multiplication-tables-check/ https://urbrainy.com/mtc https://mathsframe.co.uk/en/resources/resource/477/Multiplication-Tables-Check



Year 4

Skills taught:

- Develop knowledge of multiples of 6, 7, 9, 25, 100s
- Fluency of facts within the 10, 5, 2, 4 and 8 multiplication table
- Recall multiplication and division facts up to 12x12, and recognise products in multiplication tables as multiples of the corresponding number
- Mental calculations, e.g. 600 ÷ 3 = 200 derived from 2x3 =6
- Pupils will continue to practise recalling and using multiplication tables and related division facts to aid fluency
- Apply known multiplication and division facts to solve contextual problems with different structures, including quotative and partitive division
- Manipulate multiplication and division equations, and understand and apply the commutative property of multiplication
- Pupils should learn to round to the nearest multiples of 100
- Pupils should also be able to write and solve multiplication and division equations related to multiples of 100, 200, 250 and 500 up to 1,000
- Will learn that products within each multiplication table are multiples of the corresponding number, and be able to recognise multiples (for example, pupils should recognise, 64 is a multiple of 8, but that 68 is not)
- Learning to identify the number of hundreds in four-digit multiples of 100 should be connected to pupils' understanding of multiplication and the grouping structure of division
- By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12multiplication table and show precision and fluency in their work.

Suitable websites:

https://www.mathsisfun.com/tables.html https://www.timestables.co.uk https://ttrockstars.com/ https://www.topmarks.co.uk/maths-games/7-11-years/times-tables https://www.bbc.co.uk/teach/supermovers/times-table-collection/z4vv6v4 https://www.bbc.co.uk/teach/skillswise/times-tables/z4gs7nb



Year 5: putting multiplication into practice!

By these later years, pupils are challenged to apply the knowledge they have gained. By practising all of the multiplication tables they have learned in the order above, pupils can keep their knowledge fresh and develop their instant recall. When exploring multiplication and division facts, teaching should include a balanced range of experiences that ensure pupils consolidate and extend their learning. Part of the National Curriculum for Year 5 is to identify multiples and factors, including finding factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors.

Pupils should already know and be able to use the words 'multiple' and 'factor' in the context of the multiplication tables. They should know, for example, that the products within the 6-multiplication table are all multiples of 6, and should be familiar with the generalisation: factor x factor = product. In year 5, pupils should learn the definitions of the terms 'multiple' and 'factor' and understand the inverse relationship between them.

6 X 4 = 24 is a known number fact so children could be asked questions including:

60 X 4 =	240 ÷ 40 =	0.4 x 6 =	24 ÷ 0.4 =	2.4 ÷ 6 =
60 X 40 =	600 X 4 =	0.4 X 0.6 =	240 ÷ 60 =40	2400 ÷ 600 =

Pupils should learn that these factors can be written in any order (commutative property of multiplication) and that any pair of the factors can be multiplied together first (associative property of multiplication).

Applying o	commutativity	Applying associativity (example)
$3 \times 7 \times 10 = 210$	$3\!\times\!10\!\times\!7=210$	$3 \times 7 \times 10 = 210$
$7 \times 3 \times 10 = 210$	$7\!\times\!10\!\times\!3=210$	$(3 \times 7) \times 10 = 21 \times 10 = 210$
$10\!\times\!3\!\times\!7=210$	$10\!\times\!7\!\times\!3=210$	$3 \times (7 \times 10) = 3 \times 70 = 210$

Pupils will need regular practice of multiplication tables and associated division facts (including calculating division facts with remainders) to maintain the fluency they achieved by the end of year 4.





Skills taught:

- Ensure extended understanding of number system, place value and larger integers
- Pupils must be able to identify factors and multiples within the multiplication tables, and should learn to work systematically to identify all of the factors of a given number
- Be able to express products in the multiplication tables as products of 3 factors, where relevant, for example, 48 = 2 x 3 x 8
- Connections between x/÷ 10, 100 & 1000s
- Apply all the multiplication tables and related division facts frequently, commit them to memory and use them confidently to make larger calculations
- Learn how to find common factors and common multiples of small numbers in preparation for simplifying fractions and finding common denominators.
- Multiply numbers up to 4-digits by one/two-digit numbers using a formal written method, including short & long multiplication for two-digit numbers.
- Pupils use multiplication and division as inverses to support the introduction of ratio in Year 6.

Suitable websites:

https://nrich.maths.org/ https://www.bbc.co.uk/teach/supermovers/times-table-collection/z4vv6v4 https://www.bbc.co.uk/teach/skillswise/times-tables/z4gs7nb https://www.timestables.co.uk/ https://ttrockstars.com/ https://www.topmarks.co.uk/maths-games/7-11-years/times-tables



Year 6: using all the multiplication tables

Pupils continue to use all the multiplication tables to calculate mathematical statement in order to maintain their fluency. It is therefore crucial that children go deeper and understand what the numbers mean and how to apply their knowledge in a maths problem.

Planned experiences and activities for learning about multiplication must be sequenced and ordered in order to support progression and real understanding.

By the end of Year 6 to be fluent in all key stage 2 multiplicative number facts and calculations. To understand how to use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple and prime factorisation.

Skills taught:

- Mental calculations of mixed operations/larger integers
- Recall multiplication and division facts up to 12 x 12
- Find factors and multiples of positive whole numbers, including common factors and common multiples
- Use a given multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding
- To explore and understand common factors, multiples and prime numbers
- Connection between x/÷ fractions, decimals & ratio
- To write multiples of these powers of 10, including when there are more than 10 of given power of 10
- Multiply multi-digit numbers up to 4-digits by a two-digit whole number using the formal written method of long multiplication
- Pupils should also be able to count forwards and backwards, and complete number sequences, in steps of powers of 10
- To identify multiples of numbers, and common multiples of numbers within the multiplication tables
- To continue to fluently use all the multiplication tables to calculate mathematical statements.

Pupils should learn the multiplication tables in the 'families' described in the progression table – making connections between the multiplication tables in each family will enable pupils to develop automatic recall more easily and provide a deeper understanding of multiplication and division.

Suitable websites:

https://www.bbc.co.uk/teach/supermovers/times-table-collection/z4vv6v4 Factors, prime numbers & multiples: https://www.bbc.co.uk/bitesize/topics/zfq7hyc https://www.timestables.co.uk/ https://www.transum.org/Tables/Times_Tables.asp https://ttrockstars.com/ https://www.topmarks.co.uk/maths-games/7-11-years/times-tables