



Celebrating learning together in faith, hope and love

Multiplication Tables at Bishop Perrin

Why do we teach timestables?

Timetables are fundamental to many maths topics. Fractions is the most obvious area in which a solid knowledge and recall of timestables is useful but they are central to KS2 maths.

Freeing up working memory allows pupils to develop their reasoning skills. When children can recall a certain range of mental maths facts and carry out operations with a degree of automaticity, they can free up their working memory for newer, more challenging tasks. When timestables facts are transferred from working memory to long term memory so that they are instantly recalled rather than derived, children can focus on reasoning and more complex maths.

Multiplication and division are key concepts that need to be secure before transition to KS3 and for children to be able to access more complex concepts.

Teaching times tables facts first

1. Repeated addition 4×5 is the same as $5+5+5+5$
2. Multiplication is commutative 4×5 is the same as 5×4
3. Multiplication is the inverse of division $20 \div 5 = 4$ can be worked out because $5 \times 4 = 20$ (the use of arrays is key).
4. Number families: $4 \times 5 = 20$ $5 \times 4 = 20$ $20 \div 5 = 4$ $20 \div 4 = 5$

What do children learn and when?

EYFS

- Doubling
- Counting in multiples of 2
- Counting in multiples of 10

Year 1

- Make equal groups, add them and show repeated addition in concrete and pictorial representations.
- Doubling
- Count in multiples of 2, 5 and 10

Year 2

- Practise counting in 2s, 5s, and 10s.
- Learn to count in 3s.
- Recall and use the 2, 5 and 10 times tables.
- Know that times tables have corresponding division facts – inverse relationship
- Know that multiplication can be done in any order - commutative

Year 3

- Practise counting in 2s, 3s, 5s, and 10s.
- Learn to count in 4s and 8s.
- Recall and use the 2, 3, 4, 5, 8 and 10 times tables.
- Learn what happens when you multiply a whole number by 10 or 100.

Year 4

- Practise counting in 2s, 3s, 4s, 5s, 8s and 10s.
- Learn to count in 6s, 7s and 9s.
- Recall multiplication facts for tables up to and including 12 x 12.
- Practise division facts for tables up to and including 12 x 12.
- Learn what happens when you divide a whole number by 10 or 100.
- Learn what happens when you multiply a whole number by zero or 1.
- Start to recognise square numbers.
- Learn to multiply three numbers together.
- Recognise and use factor pairs and commutativity in mental calculations.

Year 5

- Recall multiplication and division facts for tables up to and including 12 x 12.
- Identify multiples and factors, including finding all factor pairs of a number and common factors of two numbers.
- Know the vocabulary of prime, non-prime and composite numbers.
- Establish whether a number up to 100 is prime and recall prime numbers up to 19.
- Multiply and divide whole numbers including those with decimals by 10, 100 or 1000.
- Multiply and divide numbers mentally drawing on known facts.
- Multiply 4 digit numbers by a one or two digit number using a formal method.
- Begin to multiply 4 digit numbers by a 2 digit number using the standard long method.
- Divide numbers up to 4 digits by a one-digit number using a formal written method and interpret remainders appropriately for the context.
- Divide 4 digit numbers by a single digit number using a formal standard method.
- Recognise and use square and cube numbers and the notation involved.

Year 6

- Recall multiplication and division facts for tables up to and including 12 x 12.
- Use timestables facts to solve problems.
- Multiply and divide numbers including those with decimals to 3 decimal places by 10, 100 or 1000.
- Multiply multi-digit numbers up to 4 digits by a two-digit whole number using a formal written method of long multiplication
- Use standard short and long division to divide 4 digits by a 2 digit number and interpret remainders as whole numbers, fractions or decimals as appropriate for the context.
- Perform mental calculations, including with mixed operations and large numbers
- Identify common factors, common multiples and prime numbers.
- Use their knowledge of the order of operations to carry out calculations involving the four operations

At the end of Year 4, children complete the statutory DfE Multiplication Tables Check (MTC) which is used to assess their fluency of timestables to 12 x 12.

Key vocabulary

Multiplicand x **multiplier** = product

The number being multiplied x the number of times it is multiplied = the total amount

Dividend ÷ **divisor** = quotient

The large number being separated into small groups ÷ the number of groups = the number in each group

Multiplication, multiply, multiplied by, multiple, factor, groups of, times, multiplier, multiplicand, product, once, twice, three times..., repeated addition, division, dividing, divide, divided into, divided by, dividend, divisor, quotient, grouping, sharing, share equally, share, one each, two each, three each, ten each, group in pairs, threes, tens, equal groups of, doubling, halving, array, row, column, number patterns, multiplication table, multiplication fact, division fact, inverse, square, squared, cube, cubed

How do we teach timestables?

The first step to learning timestables is counting. From being a baby through to EYFS and KS1 children learn to count long before they are able to articulate their understanding and reasoning.

Begin by counting concrete items such as shoes, socks, hands etc before moving on to using counters and other manipulatives. Children must always be given the opportunity to 'see' what a number looks like when they are learning to count in it's multiple to reinforce their understanding and to notice patterns.

It is ok to 'drill' learn timestables to develop automaticity and recall. Once children understand that one counter can be used to represent numbers in different ways, for example, 1, 2, 5 or 10, they can use their fingers to count quickly in any multiplication table.

Display the timestables in prominent places so that children see them often. Continue to recall prior learning so that children have to retrieve what they already know and make sure that they don't become 'rusty'.

- Start with the easiest and look for a pattern
- Rhymes and songs are helpful and catchy
- 10 timestable
- 5 timestable
- 2 timestable
- The 2 timestable and doubling – this leads to the 4 and 8 timestables as well as using 3 timestable to work out the 6 timestable and 12 timestable
- Use number squares to notice patterns
- Reciting tables
- The 9 timestable trick
- The 9 timestable pattern
- The 11 timestable pattern
- Counting stick
- Oral chanting
- Online games for practise – both multiple choice and self-selection

How to teach the timetables step by step:

Teaching 6 Times Table step by step

- Fire just 1×6 , 2×6 , 5×6 , 10×6 at them first. This will build up on their most secure existing table facts
- Add in 3×6 , 4×6 when step 1 is frequently recalled correctly and instantly
- Build up with 6×6 , 7×6 , 8×6
- When looking at 9×6 , 11×6 and 12×6 , children should:
- Look at finding 10×6 and adjust

- Be guided to remember what the last 2 numbers were in the sequence they learnt (66, 72)
- Add in related division facts. For some children, this step can be integrated from step 1 onwards. For others, they will need time to develop recall of multiplication facts first before adding this in.
- When giving children quick fire questions to recall, particularly in the early stages of each multiplication table, ensure they are given the opportunity to see the calculation rather than just hear it orally.
- Children should be encouraged to quickly count using their fingers to assist them with prompt questions such as '6 x 7, we did that a minute ago, can you remember what it was?

Tips for parents

How to help your child to learn their times tables at home:

<https://thirdspacelearning.com/blog/how-to-help-your-child-learn-times-tables-at-home/>

Oxford Owl – online games and printable resources:

<https://home.oxfordowl.co.uk/?s=times+tables&fwpposttypes=activities>

Oxford Owl: Timestables in school support for parents

https://assets.oxfordowl.co.uk/2014/05/13/10/30/08/349/PX_MathsContent_BK_TimesTablesInSchool_01_CH.pdf

Year 4 Multiplication Tables Check:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1031901/2022_Information_for_parents_Multiplication_tables_check.pdf

$$\begin{aligned}
 1 \times 10 &= 10 \\
 2 \times 10 &= 20 \\
 3 \times 10 &= 30 \\
 4 \times 10 &= 40 \\
 5 \times 10 &= 50 \\
 6 \times 10 &= 60 \\
 7 \times 10 &= 70 \\
 8 \times 10 &= 80 \\
 9 \times 10 &= 90 \\
 10 \times 10 &= 100 \\
 11 \times 10 &= 110 \\
 12 \times 10 &= 120
 \end{aligned}$$

$$\begin{aligned}
 (0 \times 5 &= 0) \\
 1 \times 5 &= 5 \\
 2 \times 5 &= 10 \\
 3 \times 5 &= 15 \\
 4 \times 5 &= 20 \\
 5 \times 5 &= 25 \\
 6 \times 5 &= 30 \\
 7 \times 5 &= 35 \\
 8 \times 5 &= 40 \\
 9 \times 5 &= 45 \\
 10 \times 5 &= 50 \\
 11 \times 5 &= 55 \\
 12 \times 5 &= 60
 \end{aligned}$$

$$\begin{aligned}
 (0 \times 2 &= 0) \\
 1 \times 2 &= 2 \\
 2 \times 2 &= 4 \\
 3 \times 2 &= 6 \\
 4 \times 2 &= 8 \\
 5 \times 2 &= 10 \\
 6 \times 2 &= 12 \\
 7 \times 2 &= 14 \\
 8 \times 2 &= 16 \\
 9 \times 2 &= 18 \\
 10 \times 2 &= 20 \\
 11 \times 2 &= 22 \\
 12 \times 2 &= 24
 \end{aligned}$$

Pattern = 0 5 repeated

Pattern = 0 2 4 6 8 repeated

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

The 9 times table trick

There's a great trick for recalling the 9 times table which some children really enjoy:

To find 4×9 :

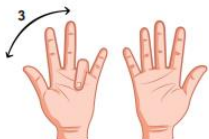
1. Hold out both hands in front of you.



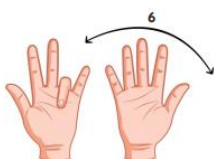
2. To find 4×9 , count in 4 fingers from the left, and hold down this finger.



3. Count all the fingers before the one that's held down – 3. This is the first number in your answer.



4. Count all the fingers after the one that's held down – 6. This is the last number of your answer.



So the answer to 4×9 is 36.

And it works for all the 9 times table up to 10×9 . Give it a go!

The 9 times table pattern

There's also a nice number pattern in the 9 times table that some children find helps them: the unit number goes down in ones and the tens number goes up in ones. (You'll notice that there's a blip at 11×9 , but then the pattern picks up again):

$1 \times 9 =$	0 9	+1 ↓ ↓ -1
$2 \times 9 =$	1 8	+1 ↓ ↓ -1
$3 \times 9 =$	2 7	+1 ↓ ↓ -1
$4 \times 9 =$	3 6	+1 ↓ ↓ -1
$5 \times 9 =$	4 5	+1 ↓ ↓ -1
$6 \times 9 =$	5 4	+1 ↓ ↓ -1
$7 \times 9 =$	6 3	+1 ↓ ↓ -1
$8 \times 9 =$	7 2	+1 ↓ ↓ -1
$9 \times 9 =$	8 1	+1 ↓ ↓ -1
$10 \times 9 =$	9 0	
blip: stays the same ↓ ↓ back to 9		
$11 \times 9 =$	9 9	+1 ↓ ↓ -1
$12 \times 9 =$	10 8	

The 11 times table pattern

There's a really clear number pattern in the 11 times table until 9×11 . Children sometimes think that the 11 times table is going to be really hard, so, when they see the pattern it's a big relief.

$1 \times 11 =$	11	
$2 \times 11 =$	22	
$3 \times 11 =$	33	
$4 \times 11 =$	44	
$5 \times 11 =$	55	
$6 \times 11 =$	66	
$7 \times 11 =$	77	
$8 \times 11 =$	88	
$9 \times 11 =$	99	
$10 \times 11 =$	110	} pattern changes
$11 \times 11 =$	121	
$12 \times 11 =$	132	

Pattern = Repeat the number being multiplied by 11

1×11 is 1 and 1 again (11)

6×11 is 6 and 6 again (66)

This pattern works up until 9×11 .

4 Times Table Pairs

Cut out each of the cards and use them to play Pairs:

Pairs (two or more players)

Place all cards face down on the table.

In turns, turn over two cards and see if they match, e.g. a 4 times table question (8×4) and its answer (32).

If they match, keep the pair. If they don't, turn them back over.

The winner is the person with the most pairs.

Multiply by 4 question and answer cards



1×4	4
2×4	8
3×4	12
4×4	16
5×4	20

4 Times Table Pairs (continued)



6×4	24
7×4	28
8×4	32
9×4	36
10×4	40
11×4	44
12×4	48

$$1 \times 6 = 6$$

$$2 \times 6 = 12$$

$$3 \times 6 = 18$$

$$4 \times 6 = 24$$

$$5 \times 6 = 30$$

$$6 \times 6 = 36$$

$$7 \times 6 = 42$$

$$8 \times 6 = 48$$

$$9 \times 6 = 54$$

$$10 \times 6 = 60$$

$$11 \times 6 = 66$$

$$12 \times 6 = 72$$

$$1 \times 8 = 8$$

$$2 \times 8 = 16$$

$$3 \times 8 = 24$$

$$4 \times 8 = 32$$

$$5 \times 8 = 40$$

$$6 \times 8 = 48$$

$$7 \times 8 = 56$$

$$8 \times 8 = 64$$

$$9 \times 8 = 72$$

$$10 \times 8 = 80$$

$$11 \times 8 = 88$$

$$12 \times 8 = 96$$