

Aims**Foundation**

By the end of the Foundation Stage most children should be able to count repeated groups of the same size and chant on and back in ones, twos and tens.

Year 2

By the end of Year 2 Most children know 2x, 5x and 10x tables

All children should use the symbols \times and $=$ to record and interpret number sentences involving multiplication and calculate the value of an unknown in a number sentence (e.g. $? \times 6 = 24$)

Year 4

By the end of Year 4 Most children are confident with the grid method and of recording and can explain their reasoning. They should know all table facts to 10×10 .

Year 6

By the end of Year 6 children are ready to use the compact short multiplication method but choose to use their preferred method. They apply their knowledge of tables to 10×10 .

Year 1

By the end of Year 1 most children can count in 2's, 5's and 10's.

Most children can find doubles to 10

Year 3

By end of Year 3 all children should know the 2,3,4,5 and 6x tables and understand the two aspects of multiplication, repeated addition and arrays. Children should begin to use informal written methods.

Year 5

By the end of Year 5 Most children are able to use the grid method for multiplication of HTU \times U and for simple decimals. They should have rapid recall of all table facts to 10×10 .



Holy Trinity C.E. (C) Primary School

Multiplication

How is your child taught to multiply?



Introduction

Mathematics is all around us; it underpins much of our daily lives and our futures as individuals and collectively.

It is of fundamental importance to ensure that children have the best possible grounding in mathematics during their primary years. Number is a key component of this.

Mathematics taught well gives children understanding about number, its structures and relationships. It underpins progression from counting in nursery rhymes to calculating with and reasoning about numbers of all sizes, to working with measures, and establishing the foundations for algebraic thinking.

These grow into the skills so valued by the world of industry and higher education, and are the best starting points for equipping children for their future lives.

At Holy Trinity we teach a range of different methods for multiplication in order to allow them to decide on the method that works best for them.

These may be very different from the ways you as parents were taught and so this booklet will hopefully give you an insight into the methods your children will be using at school so that you can support them at home.

Year 6

During Year 6 children will use knowledge of place value and multiplication facts to 10×10 to derive related multiplication and division facts involving decimals

$$0.7 \times 20 = \square$$

$$\square \times 20 = 8000$$

$$4 \times \square = 3.6$$

$$\Delta \times \square = 2.4 \text{ etc}$$

They will calculate mentally with integers and decimals.

Alongside using informal methods children are taught to use the expanded method recording the **least significant digit first** preparing children for teaching the 'Compact Standard Method'

$$\begin{array}{r}
 23 \\
 \times 7 \\
 \hline
 21 \\
 140 \\
 \hline
 161
 \end{array}
 \xrightarrow{\text{leading to}}
 \begin{array}{r}
 23 \\
 \times 7 \\
 \hline
 161 \\
 \hline
 2
 \end{array}$$

161

Children are encouraged to use the 'grid' method if it is more reliable and better understood. 254×36

x	200	50	4	=
30	6000	1500	120	7620
6	1200	300	24	1524

= 9144

By the end of Year 6 children should be able to multiply decimals with up to two decimal places by a single digit.

$$4.92 \times 3 \text{ (ans approx: 15)}$$

$$4.92 \times 3 = (4.0 \times 3) + (0.9 \times 3) + (0.02 \times 3) = 12 + 2.7 + 0.06 = 14.76$$

Children should be able to use their knowledge to solve problems and explain their reasoning in informal calculations eg.

There is space in a multi-storey car park for 17 rows of 30 cars on each of the four floors. How many cars can park?

Year 5

In Year 5, children should quickly recall multiplication facts up to 10×10 and use them to multiply pairs of multiples of 10 and 100. They should also quickly complete written questions:

$$160 \times 2 = \square$$

$$\square \times 2 = 290$$

$$0.9 \times \square = 6.3$$

$$\Delta \times \square = 1600 \text{ etc}$$

And use understanding of place value to multiply whole numbers and decimals by 10, 100 and 1000.

It is important to ensure that children use approximations before attempting calculations and that they continue to use informal methods of recording to support and explain their mental methods where the numbers are appropriate.

$$47 \times 5 = (40 \times 5) + (7 \times 5) = 200 + 35 = 235$$

Long multiplication will be taught beginning with the grid method.

Eg. 72×38

(ans. approx. $70 \times 40 = 2800$)

x	70	2	
30	2100	60	2160
8	560	16	+ 576
			2736

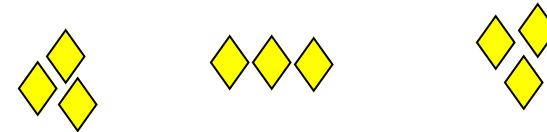
Children should be able to solve the following:

I think of a number, then divide it by 15. The answer is 20. What was number?

There are 8 shelves of books. Six of the shelves hold 25 books each. Two of the shelves have 35 books each. How many books are there altogether on the shelves?

Foundation Stage

In Reception children begin to work with multiplication by chanting numbers in regular steps for example in 2s, 5s and in 10s. They think about pairs, counting pairs of socks, and begin to have an understanding of the word double: recognising a double pushchair, double bed, double decker etc as two things that are the same. They may sing nursery rhymes with number patterns and count repeated groups of the same size.



Counting 2p, 5p and 10p coins is also a pre-requisite to multiplication.



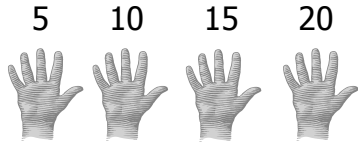
Children will solve practical problems in real life and role play contexts. For example:

Put 3 sweets on each of cake. How many sweets did you need?



Year 1

In Year 1 children continue to chant in steps of 2, 5 and 10 and solve practical problems involving 2p, 5p and 10p coins. They use hands, counting sets of 5 fingers.

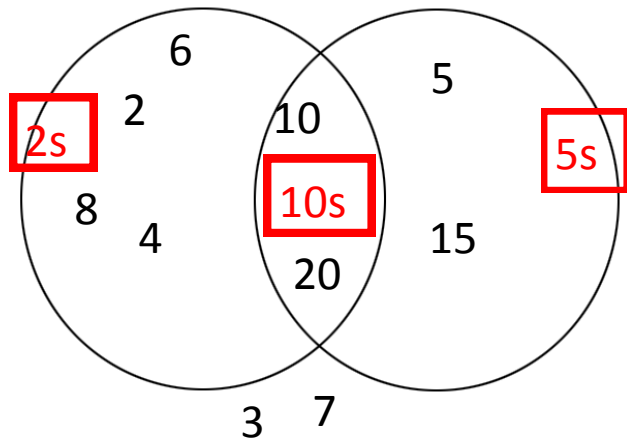


Children also use their multiplication skills to collect a given amount of fruit which is normally packed in bags of 10.

A hundred square can be used to record the patterns created when counting in regular steps.

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

Venn diagrams are used to sort multiples of numbers, showing that some numbers fall into more than one set.



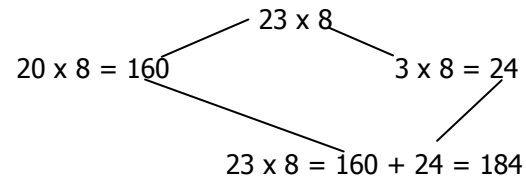
Year 4

In Year 4, children should derive and recall multiplication facts for the 2,3,4,5 and 10x tables and begin to know the 6,7,8, and 9 x tables enabling them to quickly find missing numbers in calculations eg.

$60 \times 2 = \square$ $\square \times 4 = 160$ $8 \times \square = 32$ $\Delta \times \square = 120$ etc

Children should be able to multiply whole numbers by 10 and 100 with an understanding of the effect.

They need to develop informal written methods eg partitioning when attempting calculations such as 13×8 , 23×8 . It is important at this stage that children can approximate first, in order to have a sensible idea of what the answer must be. The answer to 23×8 will be between 160 (20×8) and 200 (20×10)



When using the grid method children should be taught to draw grids with columns that are 3 squares wide to all enough space to write each number.

$$8 \begin{array}{|c|c|} \hline 20 & 3 \\ \hline 160 & 24 \\ \hline \end{array} = 184$$

When children are secure in the above methods they can move onto vertical expanded recording. Multiplying by the most significant digit first.

23×7 approx. answer will be a bit more than 140 (7×20).

$$\begin{array}{r} 23 \\ \times 7 \\ \hline 140 \text{ (} 20 \times 7 \text{)} \\ 21 \text{ (} 3 \times 7 \text{)} \\ \hline \end{array}$$

- Children should be able to solve the following:
- ◆ There are 6 eggs in a box. How many eggs in 45 boxes?
 - ◆ There are 4 stacks of plates. Three stacks have 15 plates each and one stack has 5 plates. How many plates altogether?

Year 3

In Year 3 children should know their 2x, 5x and 10x tables and begin to know their 3x, 4x and 6x tables. They will continue as in year 2 to record multiplications in number sentences using the x and = signs and recognise and use symbols such as Δ and \bigcirc to stand for unknown numbers. They should understand multiplication as repeated addition and as describing or designing an array but will use increasing numbers.

Children will record repeated addition in chunks:

$$3 \times 13 \longrightarrow 3 \times 10 = 30 \quad 30 +$$

$$3 \times 3 = 9 \quad 9 \quad \underline{\quad}$$

$$39$$

Children may use informal ways of calculating and recording using partitioning:

$$\begin{array}{c}
 13 \times 3 \\
 \swarrow \quad \searrow \\
 10 \times 3 = 30 \quad 3 \times 3 = 9 \\
 \swarrow \quad \searrow \\
 13 \times 3 = 39
 \end{array}$$

Other may be able to use the grid method

$$\begin{array}{r|l|l}
 X & 10 & 3 \\
 \hline
 3 & 30 & 9 \\
 \hline
 & & = 39
 \end{array}$$

Children will use multiplication for scaling eg. Make a tower 3 times taller than this. Draw a line 4 times longer than this.

Children will recognise when multiplication calculations are needed and be able to explain their reasoning.

- ◆ A baker puts 6 buns in each of 4 rows. How many buns does he make?
- ◆ A classroom has tables that seat 4 children. There are 6 tables. How many children can be seated?

By the end of Year 3 children will need to be able to:

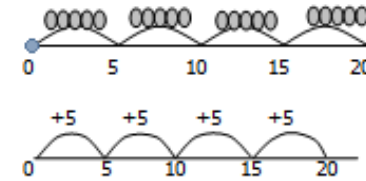
Multiply a single digit by 1, 10 and 100. Double any multiple of 5 up to 50. Multiply a 2 digit multiple of 10 up to 50, by 2, 3, 4, 5 and 10. Multiply a 2-digit number by 2, 3, 4 or 5 without crossing the tens boundary. (Eg 23×3)

Year 2

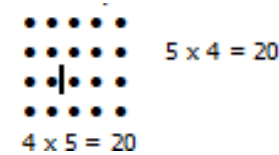
In Year 2 children begin to understand multiplication as repeated addition. Eg. There are 5 pencils in one packet, how many pencils in 4 packets?

$\text{|||||} \text{|||||} \text{|||||} \text{|||||} = 5+5+5+5$ or 4 lots of 5 or 4×5

This can also be shown as repeated jumps on a numberline-



or as an array.



Children will also be counting coins and can use a clock as a visual resource to count in 5s.

During Year 2 children should also begin to count in steps of 2, 3, 4, 5 and 10 from and back to zero, learn multiplication facts for the 2, 5 and 10 times tables and be able to find missing numbers in multiplication sentences:

$$4 \times 5 = \boxed{?}$$

$$4 \times \boxed{?} = 20$$

$$\boxed{?} \times 5 = 20$$

Children will also record simple multiplications in a number sentence using the X and = signs and begin to recognise when multiplication calculations are needed and be able to explain their reasoning.

- ◆ How many wheels are there on 3 cars?
- ◆ Katy's box is 5cm wide. Mary's box is twice as wide as Katy's box. How wide is Mary's box?

Useful websites

- ◆ www.woodlands-junior.kent.sch.uk/maths/timestable/
- ◆ http://www.familylearning.org.uk/multiplication_games.html
- ◆ <http://www.maths-games.org/times-tables-games.html>

You can also use the following games on:

www.interactive-resources.co.uk

Eggs on Legs—Mulltiplication

Sum Sense - Mulitiplication


Ghostblaster III—Multiplication Facts

Snap—Multiplication.

Sumflash -Multiplication

Enjoy and keep learning tables fun!

MULTIPLICATION CHART TO 10x10									
1	2	3	4	5	6	7	8	9	10
2	4	6	8	10	12	14	16	18	20
3	6	9	12	15	18	21	24	27	30
4	8	12	16	20	24	28	32	36	40
5	10	15	20	25	30	35	40	45	50
6	12	18	24	30	36	42	48	54	60
7	14	21	28	35	42	49	56	63	70
8	16	24	32	40	48	56	64	72	80
9	18	27	36	45	54	63	72	81	90
10	20	30	40	50	60	70	80	90	100



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The multiplication grid is a resource that children can use when solving multiplication problems when their recall of tables is not yet secure.