All Saints C of E Primary School

Year 4 Multiplication and Division

By the end of Year Four, children have been taught to:

<table>
<tr><th>Objective</th><th colspan="2">Why is it important? Things to watch out for! Taught strategies</th></tr>
<tr>
<td>recall multiplication and division facts for multiplication tables up to 12 × 12</td>
<td>
In Year 4, the expectation is that children start Year 4 confident and fluent with the recall of the 2,3,4, 5,8 and 10 times tables from their Year 3 learning. It is vital that throughout the year, even though the children move on to other times tables, that children continue to revisit the previous year's multiplication facts, to ensure they commit their multiplication facts to their long term memory.
Time is spent laying the foundations for the 6,7,8 , 9, 11 and 12 times tables by counting in different multiples.
It is important that children learn multiplication facts in different ways, such as by rote, real life context, using equipment and having a strategy to develop their conceptual understanding and ability to calculate efficiently. For example, if a child only knows his five times tables by rote, when he is asked 9x5, he could take some time, if he has to say each multiplication number sentence from 1x5 all the way up to 9x5. Alternatively, he could use rote to his advantage, if he is secure with the chant and jump back into the chant (in his head) part way through at 7x5=35, 8x5=40, 9x5=45.

Looking at patterns is crucial to making links and connections. Did you know that if you know your 2x, you know your 4x? By doubling the two times tables, you create the four times tables and if you double the four times tables you create the eight times tables! (The same can be done for the 3x and 6x.)
<table>
<tr><th>DOUBLE IT</th><th>DOUBLE IT</th><th></th></tr>
<tr><td>1X2=2
2X2=4
3X2=6
4X2=8</td><td>1X4=4
2X4=8
3X4=12
4X4=16</td><td>1X8=8
2X8=16
3X8=24
4X8=32</td></tr>
</table>
Multiplication songs and rhymes help children develop a rhythm and pattern to multiplication when learning them by rote, whereas practical activities develop visual and conceptual understanding. In this case, they are learning from experience through practical, visual and auditory stimuli. Ultimately children have to practise, practise and practise some more, so that being able to recall multiplication facts comes naturally and quickly when asked.
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<td>
Challenging a child to make a rap, song or poem about the focus multiplication fact is a fun way of being creative.
Sing a long to times tables CDs in the car!

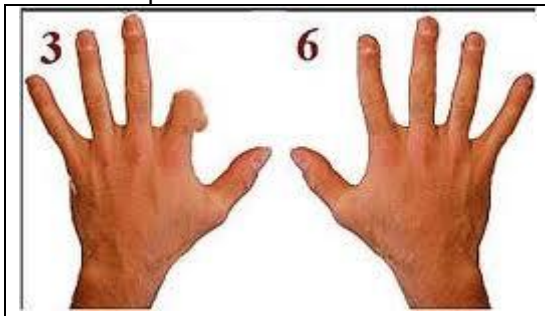
Play 'shoot the sherriff '– Stand back to back with a pretend pistol. Someone says a times table such as 5x2 and the first one to turn round with the correct answer can shoot!

Skip the times table!

Every time we catch the ball we have to say the next multiplication fact.
</td>
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</table>

Year 4

Tricks and tips



4x9=36

The nine times table trick!
Hold your hands away from you. If you want to solve 4x9 you put down your fourth finger. The fingers to the left represent 10s, so the fingers that are held up are worth 30. There are 6 fingers on the left of the finger placed down are units, therefore they are worth 6. The answer is 36! This is a great trick which children love doing as a tool to help them learn their nine times tables.



Sing the multiplication facts.

Being able to quickly recall multiplication facts allows children to be able to recall division facts quickly by recognising multiples and factors of numbers. Division 'undoes' multiplication!

6x3=18 18÷3=6

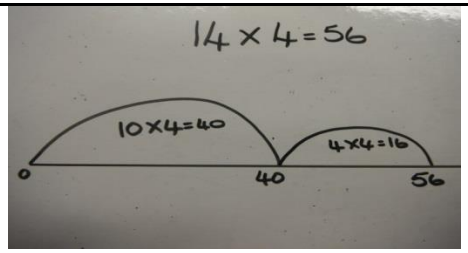
use place value, known and derived facts to multiply and divide mentally

Knowing and being able to recall times table facts is like being given a key that can easily unlock many doors in maths. This is better than having to spend a long time breaking it down and often getting very tired and frustrated in the process (Sorry for the analogy but it is true!).

By simply knowing 6x3=18 and when knowledge of place value is applied, children can generate many other facts which can help them work with much larger values and apply them to multiplication, division, fractions and percentage problems.

6x3=18	60x3=180	600x3=1800	600x30=18000	18 ÷ 3= 6	180 ÷ 3= 60	1800 ÷ 3= 600	180 ÷ 30= 6	1800 ÷ 30= 60
	6x30=180	60x30=1800	600x300=180000		180 ÷ 6= 30	1800 ÷ 6= 300	180 ÷ 60= 3	1800 ÷ 300= 6

Year 4

<table>
<tr>
<td>Multiply two-digit and three-digit numbers by a one-digit number using formal written layout</td>
<td>
</td>
<td>By Year 4, children will have experienced solving multiplication problems through practical experiences, using number lines for repeated subtraction and applying their existing knowledge of the 2,3,4,5,8 and 10 times tables. Having this base knowledge allows children to be taught how to apply these skills in a wider context, with larger values and to make links in their learning.
When calculating 14x4, we encourage children to think of chunks of multiplication which will make their ability to solve the calculation more efficient. Being taught to carry out chunks of multiplication allows calculations such as; 34x3 to be calculated as either 3 chunks of 10x3 and a chunk of 4x3 OR a chunk of 30x3 and a chunk of 4x3. Scaling up calculations from base knowledge, such as 3x3=9, allows the 30x3=90 to be calculated quickly using children's prior knowledge.
The number line work gives children the opportunity to develop their mental ability, to calculate with larger values, spot patterns and make links.</td>
</tr>
<tr>
<td></td>
<td>14x4=

<table><tr><td>X</td><td>10</td><td>4</td></tr><tr><td>4</td><td>40</td><td>16</td></tr></table></td>
<td>This method is called the grid method, which we may have seen children using. It is another stepping stone towards calculating more formally, as well as putting the building blocks for understanding multiplication in place. This is a brief step to bridge working horizontally to vertically. Some children love this strategy, whereas others find that it overcomplicates things and there are more places where errors can occur. The main aspect of this strategy is that it continues to reinforce the place value of each digit.</td>
</tr>
<tr>
<td></td>
<td>1 4
X 4
1 6 (4x4)
+4 0 (10x4)
5 6

3 7 2
X 6
1 2 (2x6)
4 2 0 (70x6)
+ 1 8 0 0 (300x6)
2 2 3 2</td>
<td>When comparing the column strategy with the grid method above, it is clear that there are many similarities, however the move towards becoming more formal is clear.
Using this strategy ensures children are able to apply their knowledge of multiplication facts, scale them up as is the case with 300x6 and whilst using place value. By going through this process and really understanding the relationship between numbers, multiplication and the effect that it has, enables children to recognise when an answer is reasonable or not.

(It may seem simpler to go straight to a compact calculation, however this does not allow children to master the ability to spot when an answer is reasonable or not. Understanding is the key to developing confident, fluent and numerate mathematicians.)</td>
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<tr>
<td>recognise and use factor pairs</td>
<td colspan="2">The term 'factor pairs' refers to the two values multiplied together to create an specific answer. For example the factor pairs for 36 are:

16 and 2 are factor pairs (16x2)
36
6 and 6 are factor pairs (6x6)
9 and 4 are factor pairs (9x4))
36 and 1 are factor pairs (36x1)
12 and 3 are factor pairs (12x3)</td>
</tr>
</table>

Year 4

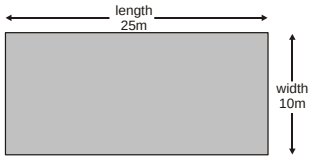
<table>
<tr><td></td><td>For children to be able to recognise and know factor pairs, it is crucial that they are fluent in their recall of multiplication and division facts.</td></tr>
<tr><td>divide a 2 or 3 digit number by a one digit number</td><td>As with multiplication, children are taught how to make the transition from horizontal number line repeated subtraction strategies for division to more formal vertical methods using chunks of multiplication.
<table>
<tr><td>52 ÷ 4 =

52
-40 (10x4)
12
-12 (3x4)
0

Answer: 52÷ 4 = 13 (10+3)</td><td>52 ÷ 4 = Fifty two exceeds 12x4, therefore children have to break down fifty two into more manageable chunks. We encourage children to think of the largest chunk of 4x that they know below 52 as a starting point. The most reasonable chunk is a chunk of 10x4=40. This value is subtracted from 52 and the answer from that calculation is then considered in terms of ‘how many 4s will go into 12’. This process continues until 0 is reached.
Potential areas of difficulty
Children find locating where the answer is a challenge and often say that the answer is 0. Going back to the original question 52 ÷ 4 = always helps children think reasonably about what the answer is. Asking children where the answer is often helps them think back to how many chunks of multiplication they subtracted from fifty two.
Another area which can sometimes cause difficulty is if the subtraction is not calculated accurately.
Children need to be focussed and logical when carrying out long division, to enable them to keep track of where they are up to in their calculation.</td></tr>
<tr><td>32 r 4
6) 1 9 6
- 1 8 0 (30x6)
16
- 12 (2x6)
4</td><td>Once children have mastered the long division strategy, they can progress to calculating with larger values.</td></tr>
<tr><td></td><td>NOTE: We do not teach compact division at this point because we feel children need to focus on the relative value and size of numbers, which will help develop their overall number sense and ability to recognise when answers are reasonable.</td></tr>
</table></td></tr>
<tr><td>Solve problems involving multiplication and division</td><td>Children often have the mathematical skills and knowledge to solve problems. However, how it is worded can often cause confusion and make children doubt their mathematical ability. Problem solving is a complex skill and requires children to think more and often do more. Children begin to realise that the answer or operation to apply to the problem may not jump out at them. Children have to understand the context of the problem, the vocabulary within the problem and from that make decisions as to what they actually have to do to solve the problem.
From the problems below children need to firstly recall their knowledge of money, length and weight then children have to read and understand what the problem is asking them to do and then recall how to use an efficient strategy for adding, subtracting, multiplying or dividing.

Example problems
Grapes cost £1.20 for 150g. How much would I get for 80p? Raspberries cost £1.50 for 150g. How much would I get for £1.00?

Cheese costs 80p for 400g. How much would 1000g cost?</td></tr>
</table>

	A rectangular swimming pool is 25 metres long and 10 metres wide.  David swims **5 lengths**. Rosie swims **12 widths**. How much **further** does David swim than Rosie?

Multiplication vocabulary: product, times, multiply, multiplication Division vocabulary: factor, quotient (the answer after division), divisible, division

year 4