All Saints C of E Primary School

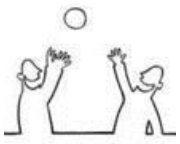
Year 3 Multiplication and Division

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

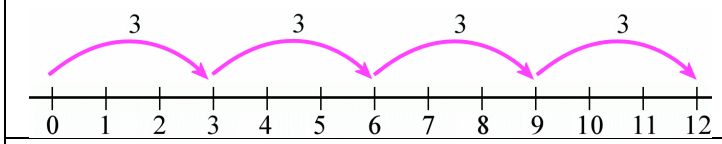
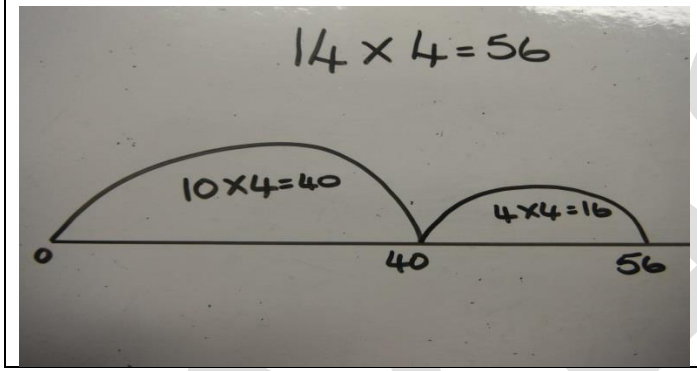
<table>
<tr><th>Objective</th><th>Why is it important? Things to watch out for! Taught strategies</th><th>Ways to support a Year 3 child.</th></tr>
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<td>recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables</td>
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As a Year 3, the expectation is that children start Year 3 confident and fluent with the recall of the 2, 5 and 10 times tables from their Year 2 learning. It is vital that throughout the year, even though the children move on to learn the 3, 4 and 8 times tables, that children continue to revisit the 2, 5 and 10 times tables to ensure they commit their multiplication facts to their long term memory.
Time is spent laying the foundations for the 3 and 4 times tables by counting in multiples of 3 and 4, circling multiples of 3 and 4, as well as looking for patterns and relationships with the times table. As with the 2, 5 and 10x, children learn their multiplication facts in many different ways and can be very personal to a child depending on how they learn and acquire knowledge best. Making it memorable is crucial!
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!
<table>
<tr><td>DOUBLE IT</td><td>DOUBLE IT</td><td></td></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
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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.
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	practise some more so being able to recall multiplication facts comes naturally and quickly when asked. 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	 Sing the multiplication facts.
write and calculate mathematical statements for multiplication and division using the multiplication tables that they know	The focus for multiplication problem solving relies on the times tables facts that children have to be able to recall rapidly from Year 2 and Year 3. The main reason for this is to allow children to develop their understanding further and to apply it in different mathematical contexts.	

	When children come back to multiplication after the summer holidays, time is needed to refresh their minds as to *repeated addition* as a strategy to solve multiplication problems quickly and efficiently. Equipment, arrays and other pictorial resources are used to reinforce the concept.
	Once children can apply their knowledge of the 3, 4 and 8 times tables and solve problems accurately using a number line, we offer challenges to see whether they can apply their knowledge further. This is a good indicator which shows whether a child can apply their knowledge of place value, multiplication and making links.

NOTE: Multiplication has *commutative qualities,* which means it can be calculated/shown as 8x2=16 OR 2x8=16, either way it still produces the same answer. Different publications, as well as different countries show it in different ways relating to *multiplicand* and *multipliers*. The *multiplier* is how many of something we want, such as I want nine bags of oranges, so the *multiplier* is nine. Each bag has three oranges in, so the *multiplicand* is three because that is how many we have in each bag. The multiplication table would be the 3x because we would add three nine times. Most of the time, due to the commutative qualities of multiplication, the answer will be the same. However, sometimes it does matter depending on the context, such as if we were buying windows.

EXAMPLES OF PROBLEMS:

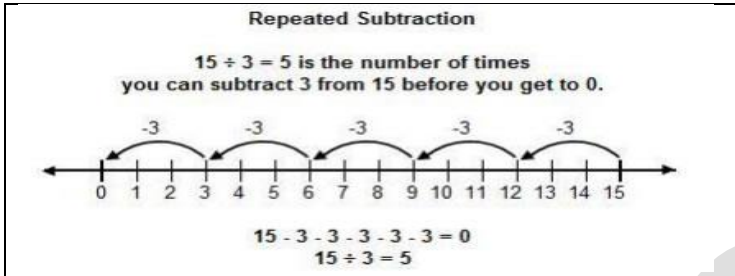
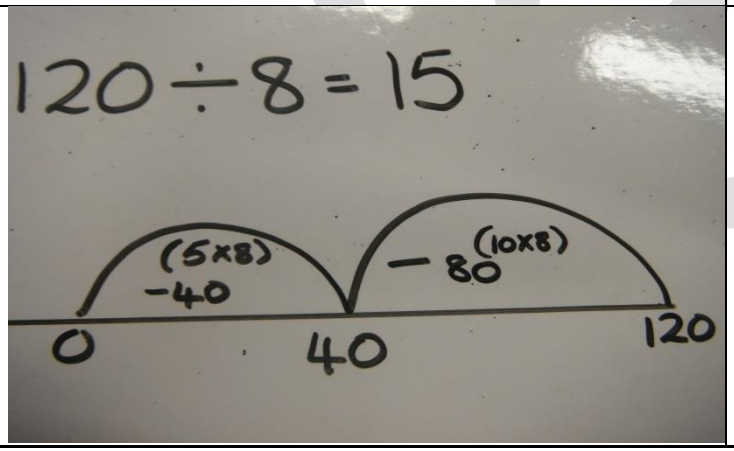
- Ella's dad washes some cars. He uses 12 buckets of water. Each bucket has 4 litres of water. How many litres of water does he use altogether?

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- A bus ticket costs 25p. How much will 8 of these tickets cost?
- Nutty lollies cost 35p each. How much do 3 Nutty lollies cost?
- It costs 75p for a child to go swimming. How much does it cost for 2 children?

Once children have mastered the concept of multiplication and learned their focus times tables, they are one step closer to learning more formal strategies.
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<tr><td>write and calculate mathematical statements for division using the multiplication tables that they know</td><td>

The focus for division problem solving relies on the times tables facts that children have to be able to recall rapidly from Year 2 and Year 3. The main reason for this is to allow children to develop their understanding further and apply it in different mathematical contexts.

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</td><td>As children's concept of division progresses from Year 2 to Year 3, so do the strategies taught. Repeated subtraction continues to be used.
At this point extra care needs to be taken due to:
• children's security in being to count backwards
• not knowing where the answer is
Sometimes, more focus is needed in class counting backwards in 3's, 4s and 8s, as well as making it explicit that the answer is the amount of jumps on the number line.
A way to bridge the gap between using equipment and a structured number line is by using a large number line and placing the counters next to their corresponding number and then drawing the jumps over the equipment. The move from equipment to number line is to aid children's efficiency in calculating. For example, if they were faced with a calculation such as 95÷5, counting out 95 pieces of equipment could be very problematic, whereas if they have a strategy, such as repeated subtraction they can solve it in half the time.</td></tr>
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Children often get muddled with division because the picture or image that they see from a context does not match with the strategy that they are using. Below is a simple illustration to show how division can differ according to whether it is division as grouping (inverse of multiplication) or division as sharing (fraction based). Yes, division is division however the slightest discrepancy can confuse a child and develop misconceptions. In the example below the same division number sentence is shown however the context and the pictures look very different. If you look closely at the problem's wording it becomes clear that they are asking very different things, even though the context is still the same with children and sweets and the number sentence is the same. In the first example the group (amount of sweets each child receives) has been set at being 2 sweets each, whereas in the second example the amount of sweets each child gets has not been set.

DIVISION THROUGH GROUPING	*DIVISION THROUGH SHARING*
There are 10 sweets, each child is given 2 sweets each. How many children receive sweets?  $10 \div 2 = 5$ Grouping – The sweets are put into groups of two, therefore five children receive sweets.	*There are 10 sweets and two children. How many sweets did each child receive if the sweets are shared equally?*  $10 \div 2 = 5$ Sharing – The sweets are shared out equally until there are none left.

EXAMPLES OF PROBLEMS

Ten children can sit at one table. There are 43 children. How many tables are needed so that each child can sit at a table?

Alan has 45 beans. He plants 3 beans in each of his pots. How many pots does he need?

Circle the two divisions which have an answer of 5 remainder 2

17 ÷ 5 17 ÷ 3 22 ÷ 4 22 ÷ 5

Year 6