WILLOWBROOK MEAD
PRIMARY ACADEMY

Teaching Times Tables

Willowbrook Mead Primary Times Table Policy

This document has been written in order to ensure consistency across the school with regards to the introduction and teaching of times tables.

The policy and work scheme is underpinned by the New National Curriculum, September 2014, and is a progressive approach which builds on children's knowledge as they move through the school.

This document explains the expected practices, to ensure children learn their times tables. It outlines 7 key steps that teachers should consider when introducing a new times table.

Step 1	Order of introduction
Step 2	Making conceptual links to the real world – display in class
Step 3	Use of the concrete, pictorial, abstract approach – use of arrays to model
Step 4	Introduce new times table by building it around facts already known
Step 5	Explore patterns in times tables – reasoning and problem solving
Step 6	Consistency of language
Step 7	Time-tabled opportunities to practise and set weekly homework.

The National Curriculum states that these tables should be learned by these year groups:

Year 1: Count on or back in ones, twos, fives, and tens

Year 2: 0s, 2s, 3s and 5s, 10s

Year 3: 4, 8 and 11s

Year 4: 6, 7 and 9, 12

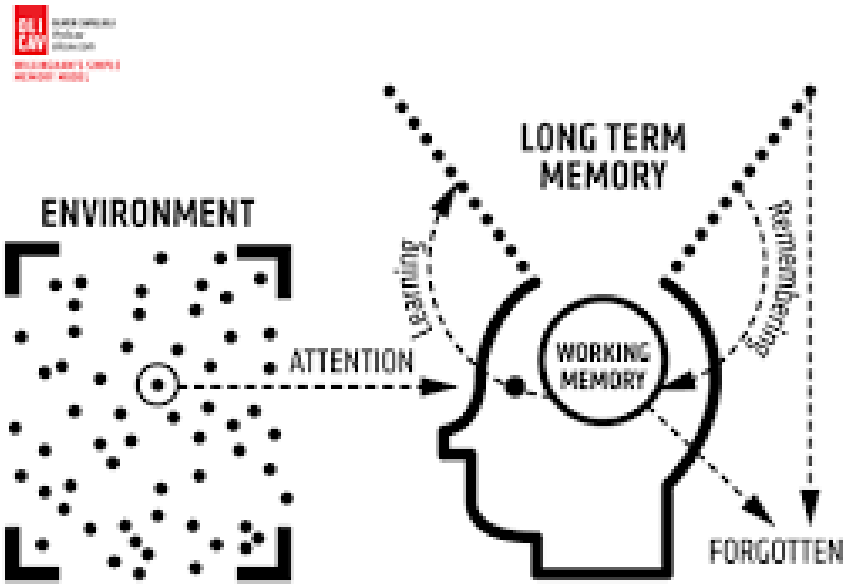
Year 5: All x and ÷ facts (12x12)

Year 6: All x and ÷ facts (12x12)

Times Tables

Times tables are a key piece of understanding for any pupil in their mathematical journey. Without them, there are many parts of the mathematical process which will allude them. More challenging mathematical concepts such as fractions can only be fully secured with a strong understanding of times tables before beginning this new learning.

A secure understanding of times tables also allows for pupils to free up more of their working memory. We can only hold a finite amount of information in our working memory and we need this space to understand what a specific mathematical question is asking of us. As such, we should work to teach times tables in a way to move them to a pupil's long term memory. This means they become instantly recalled allowing a child to confidently face the rest of a mathematical task.



Children must have opportunity to rehearse and repeat times table facts in order for them to transfer to the long term memory ready to be remembered and not forgotten.

Step 1 - Order of introduction

<table>
<tr><th>Year group</th><th>What should be taught?</th><th>Progression in learning</th></tr>
<tr><td>Reception</td><td>• Introduce concept of X1 (one group of 5 etc)
• Solve problems with doubling and halving</td><td></td></tr>
<tr><td>Year 1</td><td>• Counting in multiples of 1, 2, 5 and 10</td><td>
<table>
<tr><td>Autumn 1 & 2</td><td>Count in 2's up to 24, linking with even numbers and supporting doubles.

Count in multiples of 10 in order up to 120.</td></tr>
<tr><td>Spring 1 & 2</td><td>Focus on counting in multiples of 5 up to 60, linking with knowledge of counting in 10s.

Continue to develop fluency of counting in 2's and 10's.</td></tr>
<tr><td>Summer 1</td><td>Count in multiples of 10, 2 and 5 in order with growing fluency.</td></tr>
<tr><td>Summer 2</td><td>Count in multiples of 10, 2 and 5 in order fluently.</td></tr>
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</td></tr>
<tr><td>Year 2</td><td>• Count in steps of 2,3 and 5 from 0 and in 10s from any number forwards and backwards
• Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers.
• Begin to introduce concept of square numbers through arrays
• X1 table
• Begin to introduce X0 table</td><td>
<table>
<tr><td>Autumn 1</td><td>Consolidate counting in steps of 2, 5 and 10 in order from 0 up to 12x.</td></tr>
<tr><td>Autumn 2</td><td>Count in steps of 2 and 5 from 0 up to 12x fluently.

Recall multiples of 10 up to 12x10 in any order, including missing numbers and related division facts with growing fluency.</td></tr>
<tr><td>Spring 1</td><td>Recall multiples of 2 up to 12x2 in any order, including missing numbers and related division facts.

Recall multiples of 10 up to 12x10 fluently.</td></tr>
<tr><td>Spring 2</td><td>Recall multiples of 5 up to 12x5 in any order, including missing numbers and related division facts.

Recall multiples of 2 up to 12x2 in any order, including missing numbers and related division facts with growing fluency.</td></tr>
<tr><td>Summer 1</td><td>Count in multiples of 3 to 12x3 in order from 0.

Recall multiples of 2 up to 12x2 in any order, including missing numbers and related division facts fluently.

Recall multiples of 5 up to 12x5 in any order, including missing numbers and related division facts with growing fluency.</td></tr>
<tr><td>Summer 2</td><td>Count in multiples of 3 to 12x3 in order from 0 with growing fluency.

Recall multiples of 5 up to 12x5 in any order, including missing numbers and related division facts fluently.</td></tr>
</table>
</td></tr>
<tr><td>Year 3</td><td>• Count from 0 in multiples of 4, 8, 50 and 100
• Recall and use multiplication and division facts for the 3, 4 and
8 multiplication tables
• Revise X2, X5, X10 multiplication tables
• X1 and X0 tables
• Square number times tables</td><td>
<table>
<tr><td>Autumn 1</td><td>Count in multiples of 3 to 12x3 in order from 0 fluently.</td></tr>
<tr><td>Autumn 2</td><td>Recall multiples of 3 up to 12x3 in any order, including missing numbers and related division facts with growing fluency.

Count in multiples of 4 to 12x4 in order from 0 with growing fluency. Introduce (relating to x4) and begin to count in multiples of 8 from 0 to 12x8.</td></tr>
<tr><td>Spring 1</td><td>Recall multiples of 3 up to 12x3 in any order, including missing numbers and related division facts fluently.

Count in multiples of 4 to 12x4 in order from 0 with fluently.

Count in multiples of 8 to 12x8 in order from 0 with growing fluency.</td></tr>
<tr><td>Spring 2</td><td>Recall multiples of 4 up to 12x4 in any order, including missing numbers and related division facts with growing fluency.

Count in multiples of 8 to 12x8 in order from 0 fluently.</td></tr>
<tr><td>Summer 1</td><td>Recall multiples of 4 up to 12x4 in any order, including missing numbers and related division facts fluently.

Recall multiples of 8 up to 12x8 in any order, including missing numbers and related division facts with growing fluency.</td></tr>
<tr><td>Summer 2</td><td>Recall multiples of 8 up to 12x8 in any order, including missing numbers and related division facts fluently.</td></tr>
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<table>
<tr>
<td>Year 4</td>
<td>• Count in multiples of 6, 7, 9, 25 and 100
• Recall multiplication and division facts for multiplication tables
up to 12 x 12 (x6, x7, x9, x11 and x12 are new tables for this year group)
• Revise X0, X 1, X 2, X 3, X4, X 5, X 8, X10
• Continue with square number times tables</td>
<td>
<table>
<tr><td>Autumn 1</td><td>Recall multiples of 3,4 and 8 up to 12x in any order, including missing numbers and related division facts fluently.

Fluently count in 6's in order up to 12x6, using multiples of 3 to support.</td></tr>
<tr><td>Autumn 2</td><td>Recall multiples of 6 in any order, including missing numbers and related division facts with growing fluency.

Fluently count in 7's in order up to 12x7.</td></tr>
<tr><td>Spring 1</td><td>Recall multiples of 6 in any order, including missing numbers and related division facts fluently.

Recall multiples of 7 in any order, including missing numbers and related division facts with growing fluency.</td></tr>
<tr><td>Spring 2</td><td>Recall multiples of 7 in any order, including missing numbers and related division facts fluently.

Fluently count in 9's in order up to 12x9.
Fluently count in 11's in order up to 12x11.</td></tr>
<tr><td>Summer 1</td><td>Recall multiples of 9 in any order, including missing numbers and related division facts with growing fluency (using 10x and adjusting by 1 group to find 9x as a strategy)

Recall multiples of 11 in any order, including missing numbers and related division facts fluently.

Fluently count in 12's in order up to 12x12.</td></tr>
<tr><td>Summer 2</td><td>Recall multiples of 9 in any order, including missing numbers and related division facts fluently.

Recall multiples of 12 in any order, including missing numbers and related division facts with growing fluency (using 10x and adjusting by adding 2 more groups).</td></tr>
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<tr>
<td>Year 5</td>
<td>• Revise all times tables (including x0 and x1) to 12x12
• Revise square number times tables
• Establish whether a number to 100 is prime. Recall prime numbers to 19</td>
<td>
<table>
<tr><td>Autumn Term</td><td>Recall multiples of 12 in any order, including missing numbers and related division facts fluently.

Recall multiples of all times tables up to 12x12 in any order, including missing numbers and related division facts with growing fluency.</td></tr>
</table>
Children who did not pass the MTC in year 4 will be tracked in Year 5.
</td>
</tr>
<tr>
<td>Year 6</td>
<td>• Revise all times tables (including x0 and x1) to 12 x12
• Revise square numbers times table
• Revise prime numbers</td>
<td></td>
</tr>
</table>

Year 1 Count on or back in ones, twos, fives and tens

The skill of counting- Before any explicit times table learning is completed, it is essential that children have a secure understanding of counting. This begins as counting along from different numbers to others before progressing to counting groups of objects. By doing this, children are being introduced to the underlying mathematical concept of times tables.

Repeated addition- When learning addition, it is important that Year 1 pupils are introduced to the concept of repeated addition. 2+2+2=6

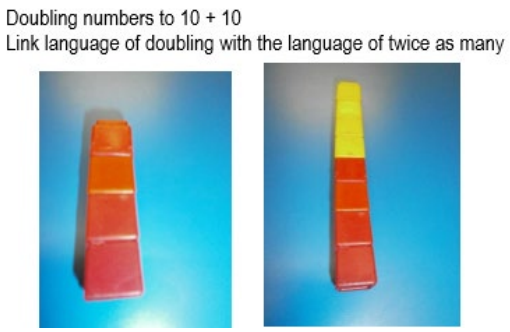
By learning this mathematical idea, the pupils are beginning to understand the way that multiplication works.

Year 2 0s, 2s, 3s and 5s, 10s

Before teaching the concept of the 2 times table introduce doubling to the pupils.

Use practical and visual resources to show doubling. Use vocabulary of double and twice as many (the same again) such as building towers and repeated numicon shapes.

Counting groups of objects and making another group with the same amount.



Teach x10 before x5 and explicitly refer to the connections between these times tables.

Year 3

4, 8 and 11s POSSIBLE- 6 and 9 for confident and secure pupils

Year 4

6, 7 and 9, 12

Link 6 and 9 to their understanding of the 3 times tables. 12 is only 12x12 as by this point they know all other x12 multiples.

Years 5 and 6

Securing the understanding of all times tables in a range of contexts including x50 x0.5 etc…

10s, 100s, 1000s

The order in which we should teach facts:

Teaching the facts within a times table should be done in a particular order to ensure that the children have a confident understanding and not just one where they can chant their way through.

Start with x2- this allows the children to secure their understanding of doubling and how this can influence the times table.

X10- This underpins place value understanding.

X5- teach as half of x10 for speed and understanding using apparatus and visuals

X3 using a number line or counting

X4- teach as double x2

X9- find x10 then take one lot off

X11- find x10 then add another lot

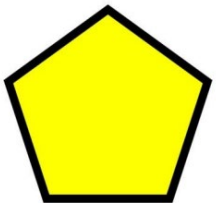
X8- double x4

X6- double x3

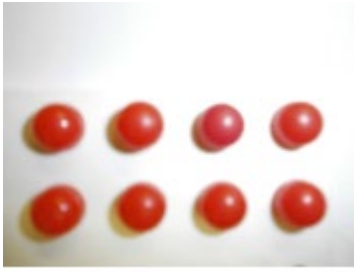
X7- understood using the commutative law

Step 2- Introduce new times tables by making conceptual links to the real world.

Make a classroom display



Using arrays introduce how 2 x 4 gives you the same as 4 x 2. Talk about commutativity and help the children to make the link that multiplication is repeated addition and that addition is also commutative.



If the children understand commutativity they need to know less facts to recall their times tables.

Times tables should be on display in every classroom for children to use as a support and reference. The display should be large enough for all children to see and table top resources can be used where necessary.

Step 3 – Ensure using CPA (concrete, pictorial, abstract) approach when teaching times tables

Bar model for representing multiplication problems

'Molly has 4 books
Harry has five times as many books as Molly
How many books has Harry?'

5 x 4 = 20 (books)

4	4	4	4	4

It is vital that times tables are explicitly taught to pupils and are not simply practiced by them using online platforms etc…

The teaching methods here can be used with pupils of all ages and the use of them in KS2 should not be diminished.

Counting objects-

Physical objects are key to understanding the idea of multiplication being a number of groups of. When counting objects, it is important that children see a wide range of physical resources not just mathematical equipment. They should be given the opportunity to count items that create a times table to secure a concrete understanding as well as an abstract one.

Learning styles and the way that they can be engaged- Times Table songs, visuals and practicals.

Whenever we are teaching times tables, we can use the wealth of online resources to explore them and engage multiple parts of the brain which helps to secure understanding for pupils. The BBC super movers series is particularly effective for songs and movement to rehearse times tables and help to move them to the long term memory.

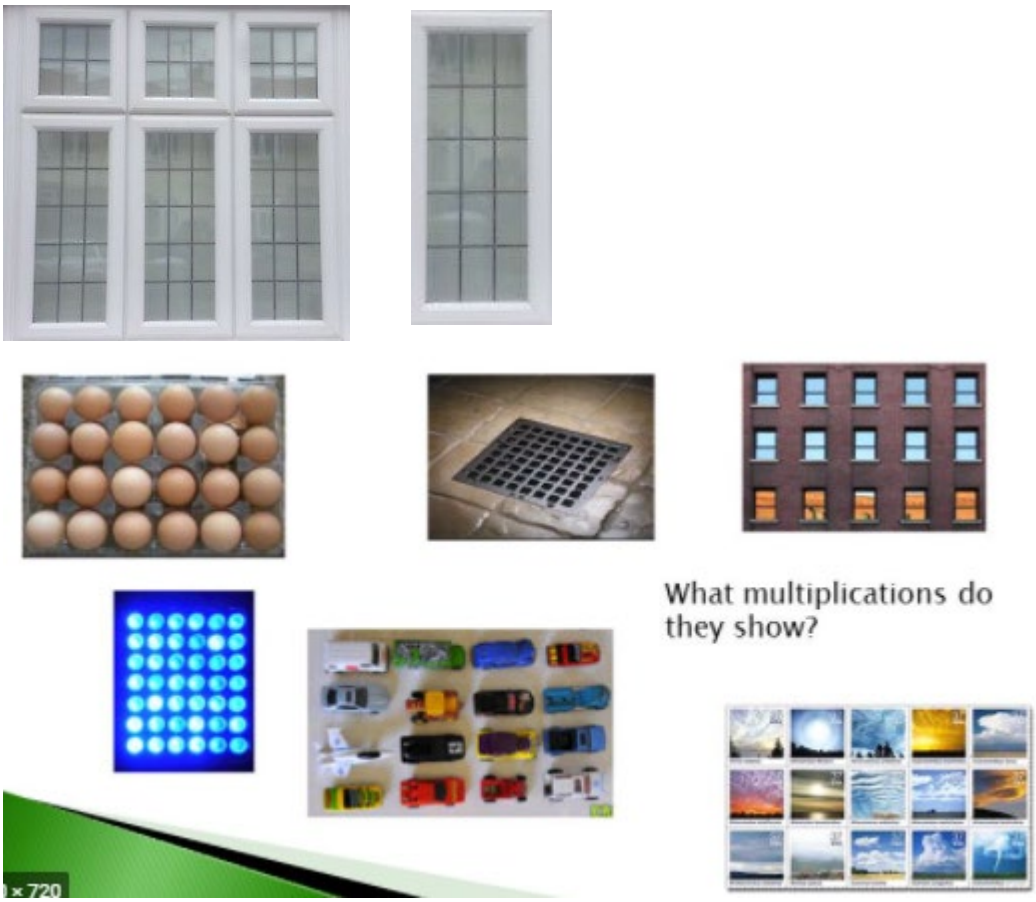
KS1 Maths Collection - BBC Teach

KS2 Maths Collection - BBC Teach

Arrays

Interpreting and making them.

Looking for arrays in the environment – e.g. the number of panes of glass in a window



By exploring arrays in the environment, children will start to see the way that they can 'spot' maths every day. You can them move this on to children making their own arrays to represent a particular multiplication fact.

Blank multiplication grids

Providing multiplication grids for the pupils to complete allows them to rehearse their facts. These can be part filled initially and slowly you reduce the number of facts in the grid so the pupil is completing the entire thing.

These then extend to quick times table recall challenges with short in class tests where the times table itself is mixed up for the pupils to recall.

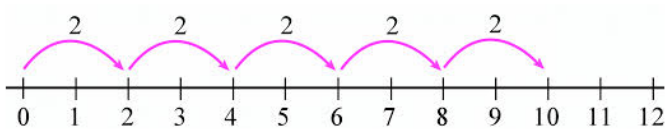
Name: _____

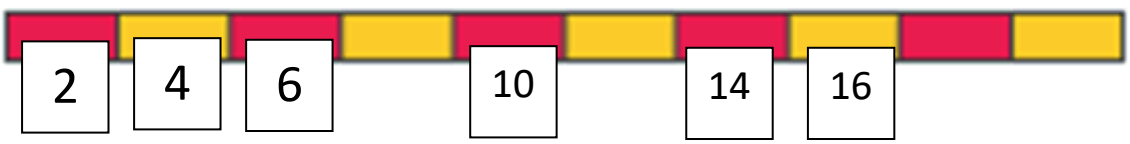
X	1	2	3	4	5	6	7	8	9	10	11	12
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												

Change the context

When children are exploring a times table, it is important to regularly change the context they are experiencing. This is done with different equipment, the counting stick, number lines and arrays all showing the same times table being learnt to ensure that the children are not simply connecting the one context with their understanding of that times table.

Below is an example of showing the 2x table in multiple contexts.





Step 4 – Introduce a new times table by building it around facts that children already know.

Do this together.

e.g. We have learned the 2,3,4,5 and 10 times tables. We have already me some of the facts from the 8 times table. What are they?

0 x 8 = 0
1 x 8 = 8
2 x 8 = 16
3 x 8 = 24
4 x 8 = 32
5 x 8 = 40
6 x 8 =
7 x 8 =
8 x 8 =
9 x 8 =
10 x 8 = 80
11 x 8 =
12 x 8 =

Which facts are left to learn?

Which facts might help us to work out the facts we don't know?

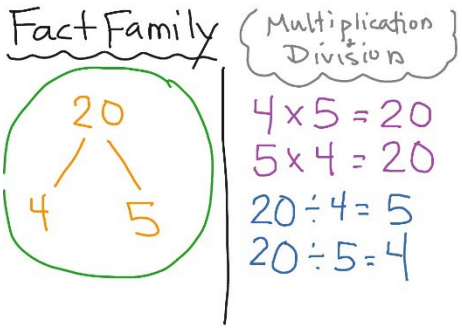
Reduce the facts - understand the relationships

1x1										
2x1	2x2									
3x1	3x2	3x3								
4x1	4x2	4x3	4x4							
5x1	5x2	5x3	5x4	5x5						
6x1	6x2	6x3	6x4	6x5	6x6					
7x1	7x2	7x3	7x4	7x5	7x6	7x7				
8x1	8x2	8x3	8x4	8x5	8x6	8x7	8x8			
9x1	9x2	9x3	9x4	9x5	9x6	9x7	9x8	9x9		
10x1	10x2	10x3	10x4	10x5	10x6	10x7	10x8	10x9	10x10	

12x11	
12x11	12x12

Refer to division facts

Whenever you are teaching times table facts, it is important that you explicitly refer to the connected division as this will help children to secure an in depth understanding. This ability to link a times table fact to the inverse will allow children to become more effective at calculating in many other contexts.



Counting sticks:

Using a counting stick is one of the best methods to help children to move from repetition to rapid recall. When using the counting stick, it is important to work systematically in order to ensure that children have a secure understanding.

Watch the linked video for a brilliant example of teaching an entirely new times table in just ten minutes. The idea of building the table with the children before counting and removing multiples is essential as this helps them to see the connections between different multiples.

https://www.youtube.com/watch?v=yXdHGBfoqfw

Using the method in the video allows the children to develop a strong understanding of a specific times table. You can then extend this understanding by mixing up the multiples and the children helping you to reorder them or removing multiples and the children identifying what is missing and how they know.

Suggested script/structure for using the counting stick

Learning the 7 times table (adapt for times table being learnt)

Step 1: What number do we always start with?

Step 2: What times table are we learning?

(repeat steps 1&2)

Step 3: Can you multiply it by 10?

(repeat steps 1&2)

Step 4: Can you double it?

Step 5: Can you double that?

(repeat steps 1-5 in order)

Step 6: I have a very special number to tell you and it is called the key. Our key in this times table is

21. What is our key?

Step 7: Can you double the key?

Step 8: This is really hard now, can you triple the key?

(Repeat steps 1-8 in order)

Suggested script/structure for using the counting stick

Step 9: Who remembers our key? (children answer) Double it. Now add seven

(repeat steps 1-9)

Step 10: Everybody touch your nose. That's 35. Touch your nose.

Step 11: Now everybody needs to help me. There is one number I always forget. It's 56. What

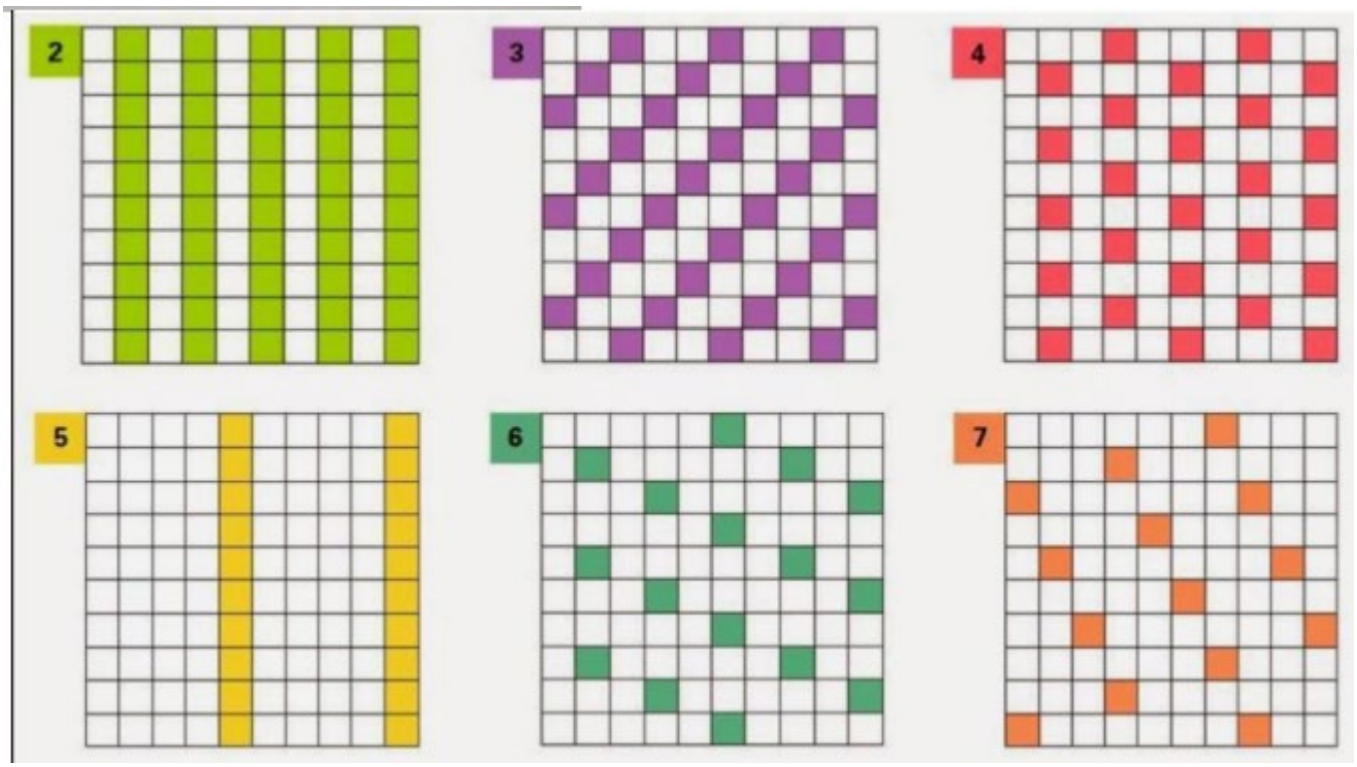
number do I always forget?

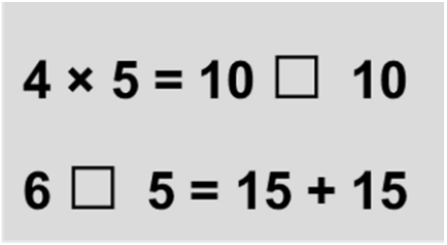
(Repeat steps 1-11)

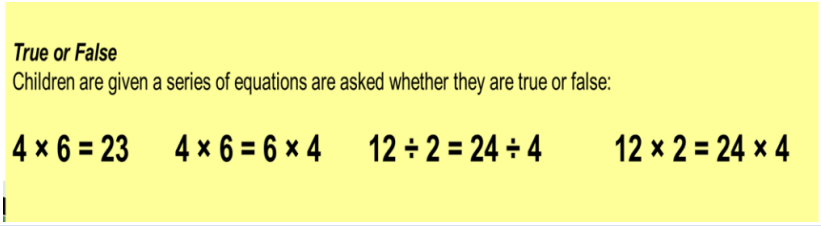
Begin to remove the cards as children become more confident with remembering

Step 5- Take time to explore the patterns of each times table as you introduce it to the class. Provide opportunities which deepen knowledge and understanding and require children to reason, conjecture, predict and explain.

Ensure children engage with 'rich' tasks/investigations linked to times tables which encourage deeper learning, greater levels of reasoning, links to be made and patterns to be discovered.







"What's the same, what's different …
between the three times table and the six times table?"

e.g - exploring last digits in multiples

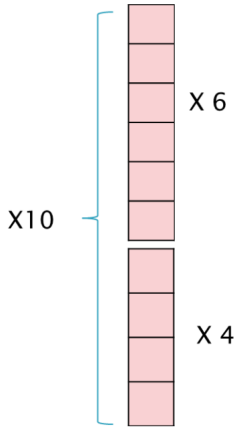
X 1 0,1,2,3,4,5,6,7,8,9,0
X 9 0,9,8,7,6,5,4,3,2,1,9

X 2 0,2,4,6,8,0
X 8 0,8,6,4,2,0

X 3 0,3,6,9,2,5,8,1,4,7,0
X 7 0,7,4,1,8,5,2,9,6,3,0

X 4 _____
X 6 _____

Pairs of times tables.
What do you notice?
What relationships can you find?



Step 6 – Consistency of how times tables are represented across the school. Language used is consistent.

Refer to vocabulary list to use with times tables.

Step 7 – Timetabled opportunities to practise times tables facts each week.

Years 2, 3 and 4: 3 x 10-minute slots each week – evident in teacher's planning. Use main lesson time to explore multiplicative reasoning.

Testing: Each Friday, the children should be tested on the times table which has been a focus for that week. The children will complete 30 questions using the Times Table Rockstar documents. The children's score should be recorded on the class times table tracker.

A gap analysis of children's results should be used by the teacher to inform planning, so that gaps in knowledge can be addressed and target children can be identified.

Homework

Times tables Ninja sheets will be introduced in year 2, 3, 4 and targeted children in Year 5 and used as weekly homework tasks appropriate to year group and ability level. Each times

table begins with exercises for practising rapid recall, followed by visual activities for applying knowledge to other areas of maths including shape, perimeter, scale factors and fractions.

Year 2 – 2-, 5- and 10-times tables facts

Year 3 – 3-, 4,8- and 11-times tables facts

Year 4 – 6-, 7-, 9- and 12-times tables facts

Encouraging revisiting

It is vital that times table learning is part of every maths lesson in order to ensure that children are regularly revisiting and rehearsing their facts. This will make sure that the times tables become second nature and are easily pulled into the working memory when they are needed.

- TT Rockstars
- Reasoning and Problem-solving tasks – Do now/Review activity
- In class tests
- Chanting in class
- Quick games for recall against each other
- Ninja homework sheets

Vocabulary to use with times tables

Array: An array is a visual representation of multiplication and division. It is shown using columns and rows.

Digit: Digits are used to form numerals. There are only ten digits (0, 1, 2, 3, 4, 5, 6, 7, 8, 9). The numeral 456 is made up of the digits 4, 5 and 6.

Factor: A factor is a number that divides into another number without leaving a remainder. For example, 5 is a factor of 25 because 25 can be divided by 5 exactly.

Lots of/Groups of/Sets of: Children will often be introduced to multiplication and division using this vocabulary before using the multiplication and division symbols, e.g. 12 is equal to 3 lots of 4, or 4 groups of 3 is equal to 12.

Multiple: A multiple is a number that is found in the times table of another number, e.g. 12 is a multiple of 3.

Product: The product is the result of multiplying two or more number together. For example, the product of 5 and 3 is 15.

Repeated addition: Repeated addition is a way of showing multiplication, e.g. $3 \times 4 = 3 + 3 + 3 + 3$.

Repeated subtraction: Repeated subtraction is a way of showing division, e.g. $12 \div 4$ can be found by subtracting 4 from 12 until there is no remainder. In this example, it can be subtracted three times.

Times table hints

1 times table

Multiplying any number by 1 does not change it, e.g. $5 \times 1 = 5$.

2 times table

Multiplying a number by two doubles it, e.g. $5 \times 2 = 10$; double 5 is equal to 10.

3 times table

The digits of numbers in the 3 times table add up to multiples of 3. In the number 24, the digits 2 and 4 add up to 6, which is a multiple of 3.

4 times table

The 4 times table is double the 2 times table, e.g. $3 \times 2 = 6$ and $3 \times 4 = 12$.

5 times table

All multiples of 5 end in either a 5 or a 0. If an odd number is multiplied by 5, the product will end in 5. If an even number is multiplied by 5, the product will end in 0.

6 times table

The 6 times table is double the 3 times table, e.g. $4 \times 3 = 12$ and $8 \times 3 = 24$.

7 times table

Numbers in the 7 times table can be found by combining numbers in the 5 times table and in the 2 times table.

$7 \times 8 = 56 \longrightarrow 5 \times 8 = 40$ and $2 \times 8 = 16$.
The sum of 40 and 16 is 56.

$7 \times 9 = 63 \longrightarrow 5 \times 9 = 45$ and $2 \times 9 = 18$.
The sum of 45 and 18 is 63.

8 times table

The 8 times table is double the 4 times table, e.g. $3 \times 4 = 12$ and $3 \times 8 = 24$.

Adding 8 to a number mentally can be done more easily by adding 10 and then subtracting 2.

9 times table

The digits in all multiples of 9 add up to 9:

$5 \times 9 = 45$ $4 + 5 = 9$

10 times table

All multiples of 10 end in 0.

11 times table

All the multiples of 11 less than one hundred have the same tens digit and ones digit:

$5 \times 11 = 55$ $6 \times 11 = 66$

12 times table

Numbers in the 12 times table can be found by combining numbers in the 10 times table and in the 2 times table:

$12 \times 7 = 84 \longrightarrow 10 \times 7 = 70$ and $2 \times 7 = 14$.
The sum of 70 and 14 is 84.

$12 \times 9 = 108 \longrightarrow 10 \times 9 = 90$ and $2 \times 9 = 18$.
The sum of 90 and 18 is 108.

Adding 12 to a number mentally can be done more easily by adding 10 and then adding 2.