



‘Where Happy Children Learn Well’

Highfield Primary School

Times Tables Policy

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Times Tables Policy

Introduction

Times tables are at the heart of mental arithmetic, which in itself helps to form the basis of a child's understanding and ability when working with number. Once children have understood and learnt their times tables by heart, they are then able to work far more confidently through a wide range of more advanced calculations. At Highfield, we believe that through a variety of interactive, visual, engaging and rote learning techniques, most children can achieve the full times table knowledge by the time they enter Year 5.

Aims:

-  To raise the profile of the teaching of times tables and to raise the overall knowledge of times table facts across the school;
-  To explain the expected practices, to ensure children learn their times tables;
-  To ensure continuity in practices and progression in times tables;
-  To ensure the successful times table teaching and learning within Highfield;
-  To provide activities that can be used to achieve success in times tables.

National Curriculum Times Tables Expectations

-  Year 1: Count in multiples of 2, 5 and 10. Recall and use all doubles to 10 and corresponding halves.
-  Year 2: Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables.
-  Year 3: Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.
-  Year 4: Recall and use multiplication and division facts for multiplication tables up to 12x12.
-  Year 5: Revision of all times tables and division facts up to 12x12.
-  Year 6: Revision of all times tables and division facts up to 12x12.

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

It is not intended to be year group specific. Instead, it outlines 6 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, i.e. displays, examples when teaching.
Step 3	Use of concrete-pictorial-abstract approach – use of arrays to model (links to Calculation policy).
Step 4	Introduce new tables by building around known facts.
Step 5	Explore patterns in times tables.
Step 6	Time-tabled/daily opportunities to practise times tables facts.

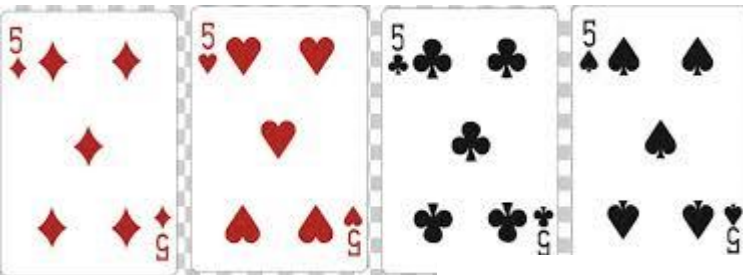
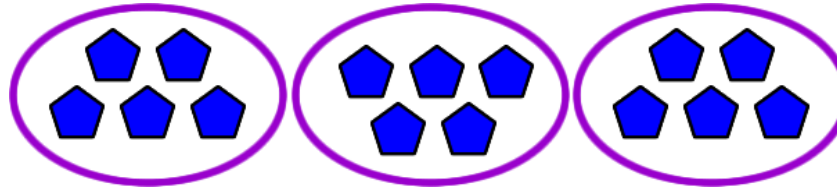
Step 1 – Order of Introduction

<u>Yr Group</u>	<u>What should be taught</u>	<u>Additional Information</u>
Reception	 Introduce concept of x1, (one group of 5) etc;  Solve problems involving doubling and halving.	
Year 1	 Counting in multiples of 2, 5 and 10;  X1 table, one group of.	
Year 2	 Count in steps of 2,3 and 5 from 0 and in 10s from any number forwards or 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;  Look at X0 in tables.	
Year 3	 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;  Square number times tables.	Link X4 to X2. Link X8 to X4.
Year 4	 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;	Link X6 to X3. Link X12 to X6.
Year 5	 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.	
Year 6	 Revise all times tables (including x0 and x1) to 12 x12;  Revise square number times table;  Revise prime numbers.	

Step 2 – Making Conceptual Links

Make classroom displays or make explicit links when teaching in the daily ten minute sessions.

Example: x5

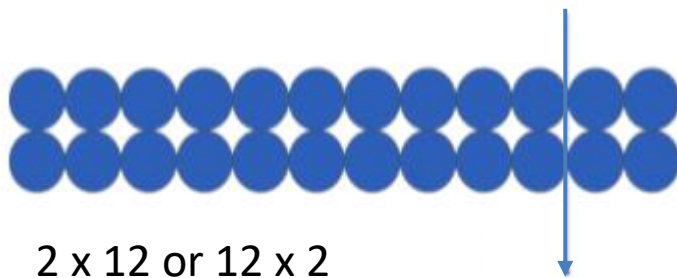


Step 3 – Ensure CPA approach (concrete, pictorial, abstract) when teaching times tables.

Be clear which representation you will use and why

Arrays for Representing Multiplication

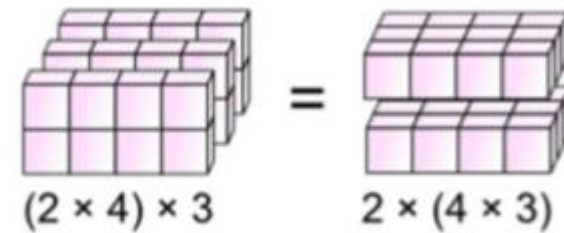
Arrays are the most versatile model for modelling the properties of multiplication (repeated addition, commutative, distributive, associative, inverse of division).



2×12 or 12×2

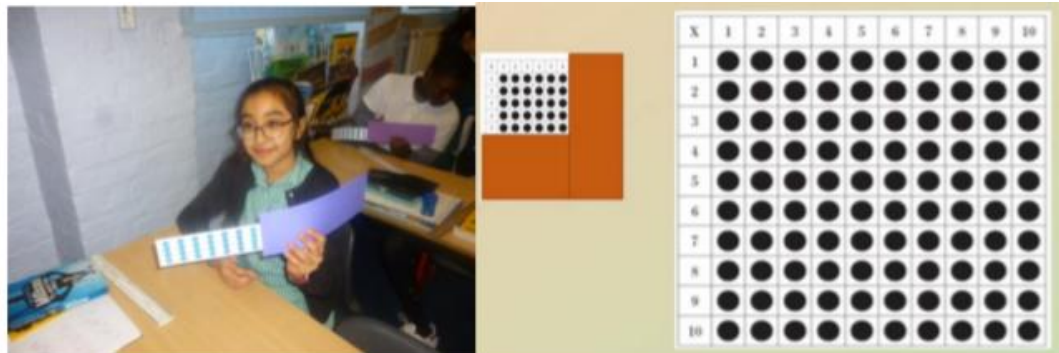
$(10 \times 2) + (2 \times 2)$

Make use of Array Sliders!
(like Flip-Flaps)



$$12 \times 2 = (4 \times 3) \times 2 = 24$$

Bar Model can help



represent multiplication problems



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



$$5 \times 4 = 20 \text{ (books)}$$

4

4	4	4	4	4
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20

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 done some of the facts from the 8 times table. What are they?

$$0 \times 8 = 0$$

$$1 \times 8 = 8$$

$$2 \times 8 = 16$$

$$3 \times 8 = 24$$

$$4 \times 8 = 32$$

$$5 \times 8 = 40$$

$$6 \times 8 =$$

$$7 \times 8 =$$

$$8 \times 8 =$$

$$9 \times 8 =$$

$$10 \times 8 = 80$$

$$11 \times 8 =$$

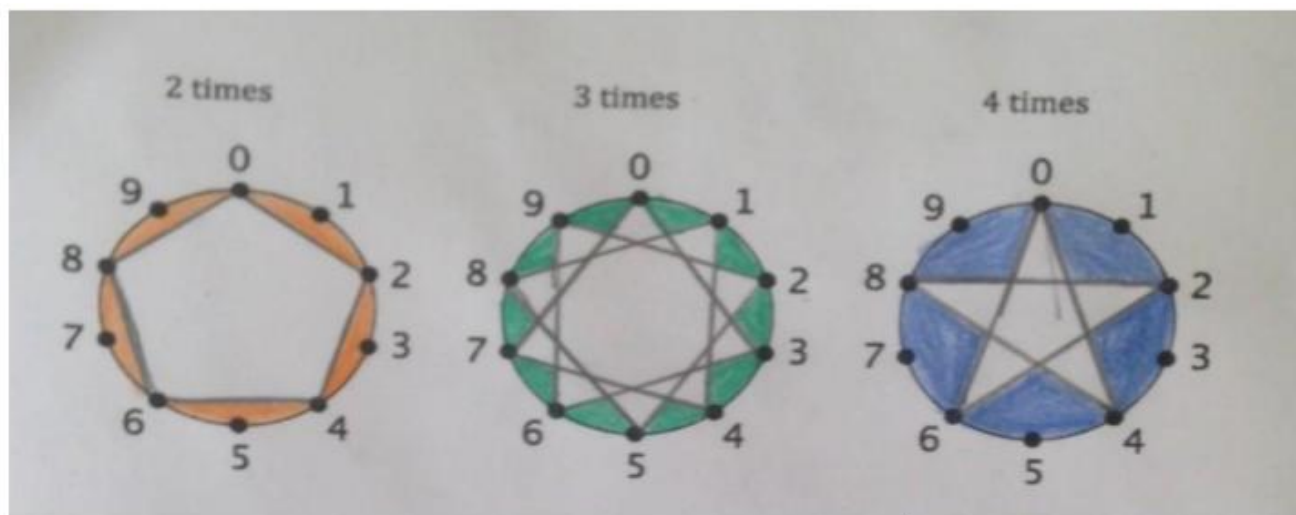
$$12 \times 8 =$$

Which facts are left to learn?

Which facts will help us to
learn the ones we don't
know?

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.

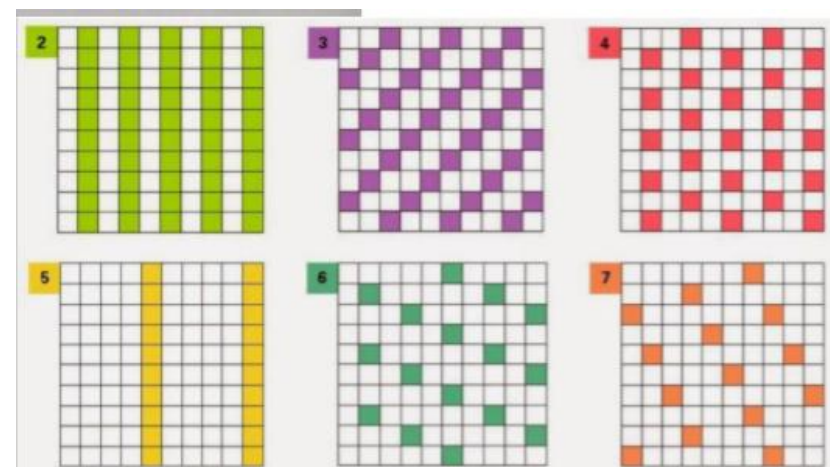


Plot the ones digit of the times tables answers.

What patterns do you create?

What do you notice?

Are there any patterns that are the same? Why?



Use 100 squares to plot answers and spot patterns.

e.g. Exploring the last digit in multiples.

$$\begin{array}{l} 0 \times 3 = 0 \\ 1 \times 3 = 3 \\ 2 \times 3 = 6 \\ 3 \times 3 = 9 \\ 4 \times 3 = 12 \\ 5 \times 3 = 15 \\ 6 \times 3 = 18 \\ 7 \times 3 = 21 \\ 8 \times 3 = 24 \\ 9 \times 3 = 27 \\ 10 \times 3 = 30 \\ 11 \times 3 = 33 \\ 12 \times 3 = 36 \end{array}$$

10 possible
endings

$$\begin{array}{l} 0 \times 6 = 0 \\ 1 \times 6 = 6 \\ 2 \times 6 = 12 \\ 3 \times 6 = 18 \\ 4 \times 6 = 24 \\ 5 \times 6 = 30 \\ 6 \times 6 = 36 \\ 7 \times 6 = 42 \\ 8 \times 6 = 48 \\ 9 \times 6 = 54 \\ 10 \times 6 = 60 \\ 11 \times 6 = 66 \\ 12 \times 6 = 72 \end{array}$$

5 possible
endings

**What do you
notice about
the digital
roots?**

Sum of the digits

Investigating how many different possible endings there are for different times tables. Spotting patterns and relationships. Hypothesising. Generalising.

i.e. If all the two times tables are even, what can we say about the 4? Prove it.

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

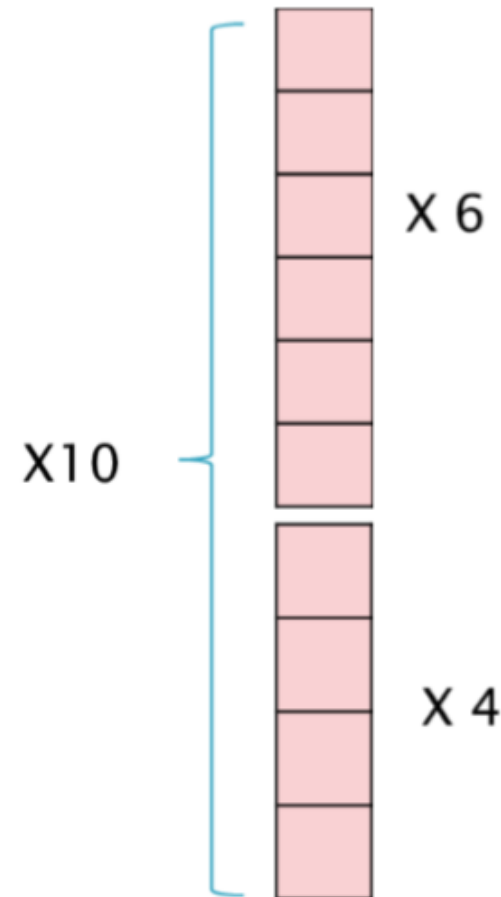
X 3 0,3,6,9,2,5,8,1,4,7,0
X 7 0,7,4,1,8,5,2,9,6,3,0

X 4 _____
X 6 _____

Pairs of times tables.

What do you notice?

What relationships can you find?



Intelligent Practice

$2 \times 3 =$

$2 \times 30 =$

$2 \times 300 =$

$20 \times 3 =$

$200 \times 3 =$

$6 \times 7 =$

$6 \times 70 =$

$6 \times 700 =$

$60 \times 7 =$

$600 \times 7 =$

$9 \times 8 =$

$9 \times 80 =$

$9 \times 800 =$

$90 \times 8 =$

$900 \times 8 =$

What's different?

What's stayed the same?

$3 \times \square + 2 = 20$

$3 \times \square + 2 = 23$

$3 \times \square + 2 = 26$

$3 \times \square + 2 = 29$

$3 \times \square + 2 = 35$

$4 \times 5 = 10 \square 10$

$6 \square 5 = 15 + 15$

$6 \square 5 = 20 \square 10$

$8 \square 5 = 20 \square 20$

Relationship between 10 and 5

$1 \times 10 = 2 \times 5$

$2 \times 10 = 4 \times 5$

$3 \times 10 = 6 \times 5$

$4 \times 10 = 8 \times 5$

$5 \times 10 = 10 \times 5$

$6 \times 10 = 12 \times 5$

Half of 10 is 5 Double 5 is 10 etc

Other examples of ways to deepen knowledge and understanding:

Always, Sometimes, Never

-  Multiples of 3 are odd.
-  If the digit sum of a number is 9, the number is a multiple of 9.
-  Multiples of 7 are odd.
-  When you multiply by an even number, the product is even.
-  When you multiply a number by itself, the product is even.
-  If you multiply two numbers together the product will always be bigger.

What's the same, what's different...

-  Between the 3 and the 6 times tables;
-  Between multiples of 5 and 10;
-  Between multiples of 2 and 10;
-  9×8 and 8×9 .

Models and Stories

Here is an expression involving 12 and 3:

$$12 \times 3$$

Think of:

-  Some ways of saying 12×3 ;
-  Some ways of calculating 12×3 ;
-  Some diagrams that fit the expression;
-  Some stories that fit the expression.

Correct or not correct/Fact or Fib/True or False

-  $4 \times 6 = 23$;
-  $4 \times 6 = 6 \times 4$;
-  $12 \div 2 = 24 \div 4$;

Step 6 – Timetables opportunities to practise times tables each week and use the strategies outlined

'Times Tables Ten Minutes'

This should be a ten minute period, three times a week, where children can access the activities mentioned here, as well as receive teaching and intervention where necessary.



Main teaching in lessons would be to explore multiplicative reasoning.

Further Ideas:



The Pendulum

Split class into two teams. Must call out next multiple in times tables.

Forwards and backwards.

Start at different points

Quiet and loud (6X can be heard in X3)

Can apply to other areas of curriculum e.g. counting in decimals, fractions, percentages.

Beach ball

Throw round classroom. Person receiving must say next multiple in times tables.

Or...

Pass around room. Count silently in head. Teacher says 'back to me'. Ball returned to teacher. When teacher receives, children call out loudly the next multiple.

Or...

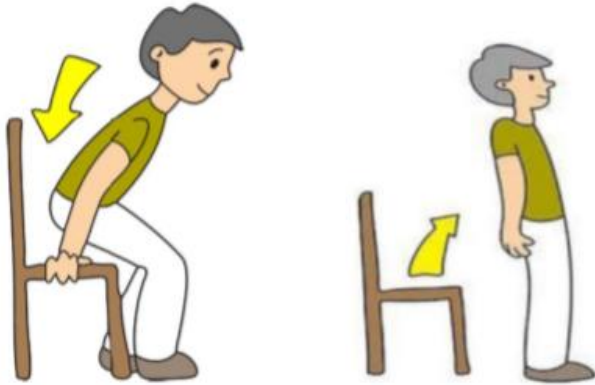


'The Gong'

Count silently in multiples of TT.

When I raise stick, call out number I have stopped at.

Stand Up, Sit Down



Sit in pairs: e.g. x8

-  Say times tables in turn, one multiple each;
-  Repeat remembering the multiples they say;
-  Answer questions such as:
 - Stand up if your multiple was 8 more than 24
 - Stand up if your multiple was even. Why is that?
 - Stand up if yours was a square number
 - Stand up if your multiple was 16 less than 32

Target Boards (Loads of these ready made in Excel file – Build a Sequence Materials – Main)

-  Tell me an odd number? And another. How do you know?
-  Which numbers are factors of 20? How do you know?
-  Is 19 a multiple of 3. Convince me. Give me a multiple of 3.
-  How many prime numbers can you find?
-  Can you find three numbers that you can use to make a multiplication/division calculation?

10	8	5	18	4
9	20	13	3	6
16	12	15	7	19
1	2	17	11	14

Counting Stick

Let's count in 2's...



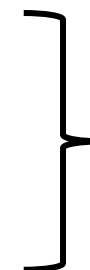
Now can we count in 20s?
What has happened to our
numbers?

These videos are well worth watching. These activities could be done over a few sessions in your 'Times Tables Ten Minutes'.

<https://www.youtube.com/watch?v=yXdHGBfoqfw&t=4s> The 17 times tables

<https://www.youtube.com/watch?v=sWsjlsuuE4I> The 3 times tables

<https://www.youtube.com/watch?v=aoUidm704PU&t=271s> The 4 times table (NCETM)



All similar idea – very effective

Another way to use the stick. Possible script.

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)

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.



Home Learning

Children need to be encouraged to practise times tables at home on a regular basis. This can be in the form of times table 'challenges', identifying times table patterns, practising with parents or listening to times tables songs. Times Table Rock Stars is a home learning tool to which all pupils from Year 2 (Summer Term) to Year 6 have access. It is a carefully sequenced programme of daily times tables practice. Each week concentrates on a different times table, with a recommended consolidation week for rehearsing the tables that have recently been practised every third week or so. Teachers can access and set learning tasks for pupils and children are expected to be actively encouraged to access this platform from home.