



ECM TRUST – Multiplication Policy

This document has been written to encourage consistency of teaching times tables across the school.

It focuses on 7 steps that teachers should follow when introducing a new times table.

Step 1	The order which times tables are taught throughout school. Dedicate 6 weeks (or 1 half term) to each times table.
Step 2	Consistently present times tables across the school with a clear understanding of language and vocabulary. Multiplier x Multiplicand = Product
Step 3	When introducing a new times table, build it around facts already known.
Step 4	Make clear conceptual links to real life- ' <i>What comes in...?</i> ' display.
Step 5	Regular times tables practise using high-quality activities to develop fluency and verbal patterning. 10 minutes, 3 times weekly.
Step 6	Introduce a new times table using concrete, pictorial, abstract (CPA) approach for all children and using the array as a priority model.
Step 7	Explore the patterns of each new times table as you introduce it to the class.
Step 8	Develop an overarching Mastery Approach to teaching and learning times tables.



Step 1	The order which times tables are taught throughout school. Dedicate 6 weeks (or 1 half term) to each times table.
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	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS	Have an understanding of: Unitizing Equal/Unequal Groups					
Year 1	Have an understanding of: Unitizing More Than One Group Equal/Unequal Groups					
	Counting in steps of 1 Counting in steps of 2 Counting in steps of 5 and 10					
Year 2	Have an understanding of: Unitizing More Than One Group Equal/Unequal Groups Early Relationship between + and ×					
	Re-cap Counting in 1s,2s,5s & 10s	Introduce Multiplication Terminology X1	(X1) -> X2	X5	(X5) -> X10	Consolidation
Year 3	Re-cap x2s, x5 & x10	(X2) -> X4	(X4) -> X8	X3	(X3) -> X6	Revision
Year 4	(X6) -> X12	X9	X7	X11	Consolidation and MTC	
Year 5	Audit: Individual classes to identify gaps Multiplication Tables, Mega Facts, Mini Facts, Mastery					
Year 6	Audit: Individual classes to identify gaps Multiplication Tables, Mega Facts, Mini Facts, Mastery					



Step 1b	What do children need to know BEFORE they begin to learn their Times Tables? (pre-requisites)
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1. Unitizing

'First being able to consider many as one, such as one group, one basket of things'

2. Bringing together more than one unit

'Counting in groups and seeing each group as one unit is essential'

3. Equal and NOT Equal Groups

<p>2.2 Multiplication: equal groups Step 1:3</p> <p>Equal groups ✓ Unequal groups</p>	<p>2.2 Multiplication: equal groups Step 1:3</p> <p>Equal groups Unequal groups ✓</p>	<p>2.2 Multiplication: equal groups Step 1:3</p> <p>Equal groups Unequal groups ✓</p>
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4. Understanding the early relationship between + and ×

When children are confident with these concepts and can combine equal groups to calculate a product, they can begin to incorporate strategies to learn and understand Tables Tables.



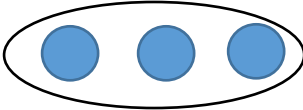
Step 2	Consistently present times tables across the school with a clear understanding of language and vocabulary. Multiplier x Multiplicand = Product
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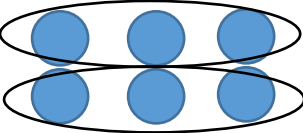
When introducing a new times table. We will use the following language for consistency:

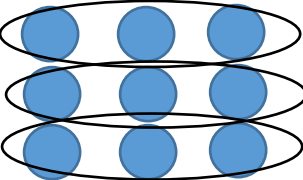
- Times (e.g. 1 times 3)
- Lots of (e.g. 1 lot of 3)
- Groups of (e.g. 1 group of 3)
- Sets of (e.g. 1 set of 3)
- 1 x 3 (e.g. 1, three)
-

This language works with the following array representation:

(e.g. lots of 3...)

1x3 = 

2x3 = 

3x3 = 

Correct Terminology

1 x 3 = 3

1 (multiplier) x 3 (multiplicand) = 3 (product)

5 x 3 = 15

Factor x Factor = Product

5 x 3 = 15

Multiplier x Multiplicand = Product

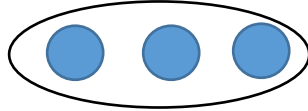


When introducing commutative properties, teachers should introduce the language:

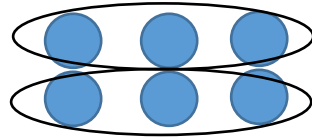
- **Multiplied by**

This language works with the following array representation:

3 multiplied by 1 =



3 multiplied by 2 =



Correct Terminology

$$3 \times 1 = 3$$

3 (multiplicand) \times 1 (multiplier) = 3 (product)

$$3 \times 5 = 15$$

Factor \times Factor = Product

$$3 \times 5 = 15$$

Multiplicand \times Multiplier = Product

It is important that children understand all language, as well as the representation to match the language from Year 2 and above as part of the National Curriculum.

Reception/KS1:

Teachers should encourage children to develop their use of language by showing children images and asking them to create their own multiplication number sentences. This allows for real life links and checks understanding.



“I can see 6 boats with 3 children in each.”



6 groups of 2
6 times 2
6 lots of 2

Encourage children to write a number sentence/draw an array/create an array using cubes.

**Step 3**

When introducing a new times table, build it around facts already known.

This half term you will be learning the 8x table

What tables have you already learned:

0x, 1x, 2x, 4x, 5x and 10x tables.

In these tables you have already met some of the 8x table.

What facts do you already know?

What facts are new?

We will now spend time working on this 8x table starting with ...

What comes in 8s?

$$0 \times 8 = 0$$

$$1 \times 8 = 8$$

$$2 \times 8 = 16$$

$$3 \times 8$$

$$4 \times 8 = 32$$

$$5 \times 8 = 40$$

$$6 \times 8$$

$$7 \times 8$$

$$8 \times 8$$

$$9 \times 8$$

$$10 \times 8 = 80$$

$$11 \times 8$$

$$12 \times 8$$

- Teachers to introduce every new times table in this way, using the same slide. Focus on any facts the children may know already, highlighting them in a colour (black in the example). Help the children build in what they already know. Focus on the patterns for each one. Write up any pattern hints and tips!
- Teachers to display this slide in the classroom and use it as a working document when children have learnt the new multiplication facts.

**Step 5**

Regular times tables practise using high-quality activities to develop fluency and verbal patterning. 10 minutes, 3 times weekly.

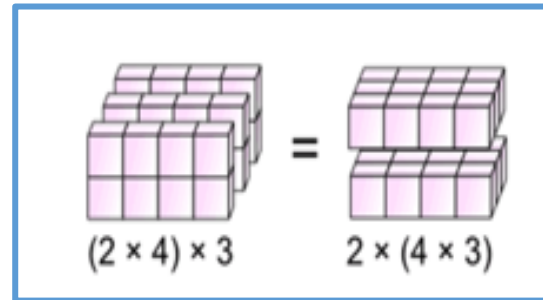
- ***Maths lesson time*** to explore multiplicative reasoning (3 lessons per half term focussed on one table).
- ***Times table practice time*** to practice specific activities for rapid recall activities - 10 mins 2/3 days per week.

Resources for these sessions are available for staff to use.



Step 6

Introduce a new times table using concrete, pictorial, abstract (CPA) approach for all children and using the array as a priority model.



- Arrays are the most versatile model for modelling the properties of multiplication (repeated addition, commutative, distributive and associative).
- Arrays should be used as the main and most common used model for teaching multiplication starting in year 1 so that by year 4 this method is mastered.
- The array as the core representation across the school is to support the properties of multiplication, ensure consistency and progression.
- Other models such as number line and groups to be used alongside.



Step 7

Explore the patterns of each new times table as you introduce it to the class.

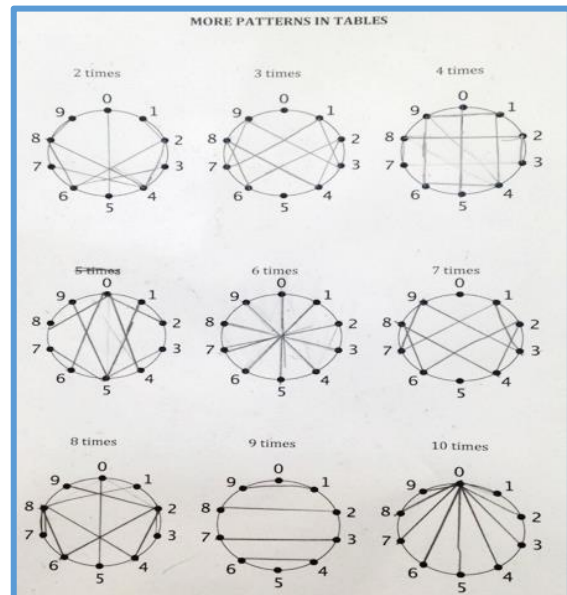
- Children to explore the patterns of each new times table as introduced, with particular focus on:
 1. Repetition of 'ones' endings
 2. Addition of both digits
 3. Doubles (x2 x4 x8 etc.)
 4. Number bonds to 10 (x6 x4)

X1 0,1,2,3,4,5,6,7,8,9,0
 X9 0,9,8,7,6,5,4,3,2,1,0

 X 2 0,2,4,6,8,0
 X8 0,8,6,4,2,0

 X3 0,3,6,9,2,5,8,1,4,7,0
 X7 0,7,4,1,8,5,2,9,6,3,0

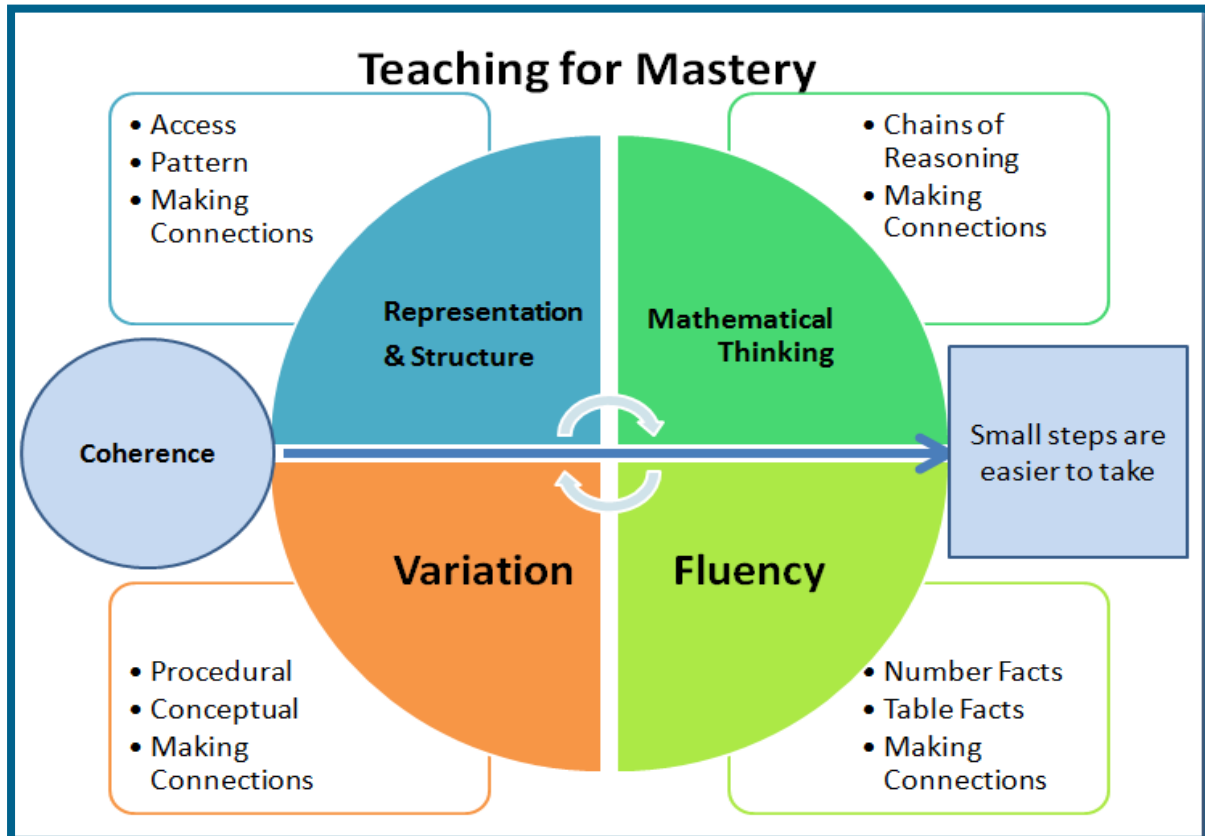
 X4 0,4,8,2,6,0
 X6 0,6,2,8,4,0





Step 8

Develop an overarching Mastery Approach to teaching and learning times tables.



Involves the development of three forms of knowledge:

Factual – ‘I know that ...’

Procedural – ‘I know how...’

Conceptual – ‘I know why ...’



Tasks that are chosen should:

- Highlight the essential identity of a concept
 - Involve reasoning
 - Expose the structure
- Expose connections and relationships

Help pupils to generalise and apply

Procedural Variation

$2 \times 3 =$

$6 \times 7 =$

$9 \times 8 =$

$2 \times 30 =$

$6 \times 70 =$

$9 \times 80 =$

$2 \times 300 =$

$6 \times 700 =$

$9 \times 800 =$

$20 \times 3 =$

$60 \times 7 =$

$90 \times 8 =$

$200 \times 3 =$

$600 \times 7 =$

$900 \times 8 =$

$3 \times \square + 2 = 20$

$3 \times \square + 2 = 23$

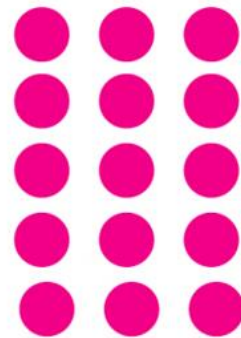
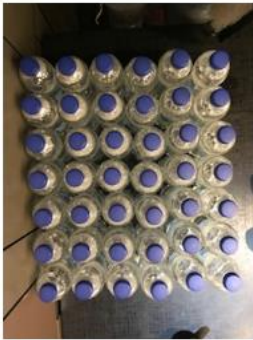
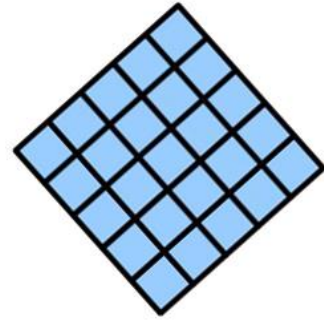
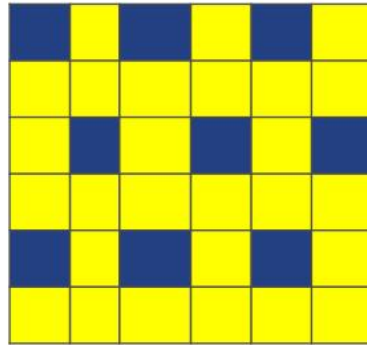
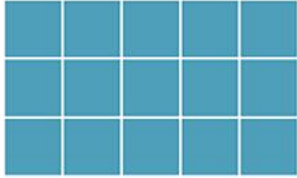
$3 \times \square + 2 = 26$

$3 \times \square + 2 = 29$

$3 \times \square + 2 = 35$



Conceptual Variation



What do you notice?

Which are arrays? Which are not? WHY?



Times Tables Beyond Y4...

Audit:

Individual classes to identify gaps

Multiplication Tables, Mega Facts, Mini Facts, Mastery

- Children who are fluent in times tables up to 12×12 and display a deep conceptual understanding should begin to make connections with a multiplication fact and how that can be manipulated to show other areas of the mathematics curriculum. For example, MEGA and MINI facts:

MEGA and MINI Facts

FACT

$$7 \times 8 = 56$$

MEGA FACTS

$$70 \times 8 = 560$$

MINI FACTS

$$0.7 \times 8 = 5.6$$