St John's C of E Primary School – Multiplication Procedures
(September 2022)

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.

Pre-requisites

1) Unitize   2) Bring together more than one unit
3) Equal/Unequal Groups   4)Understand Early Relationship between + and ×

Step 1	Decide **the order** you will teach tables, and which tables you will include – dedicate half term to each TT
Step 2	Have a consistent way to **present** 'Times Tables' across the whole school – with a clear understanding of the **language** you will all use
Step 3	When introducing a new times table **build it around facts already known** –have a format for doing this which is consistent
Step 4	Introduce a new TT by making clear conceptual links to the real world – a **display (what comes in …)** for half term to support conceptual understanding and word problems
Step 5	Regular TT **Practice Time** using a 'Bank of High-Quality Activities' to develop fluency and verbal patterning -10 mins 3 times weekly
Step 6	When you introduce a new times table use the **Concrete Pictorial Abstract approach** Choose the **Array as a CORE representation**

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 of times table taught from years one to four. Upper Key Stage 2 to follow similar structure to identify and close gaps.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Reception Pre-requisites	Unitizing 'First being able to consider many as one, such as one group, one basket of things'		Bringing together more than one unit		Equal and NOT Equal Groups	
Year 1 Pre-requisites	Revision of pre-requisites from R	Understanding the early relationship between + and ×	Counting in 1s, 2s, 5, 10s			1×
Year 2	(1×) 2×	5×	(5×)10×	3×	0×	revision
Year 3	(2×) 4 ×	(4×) 8 ×	3×	(3×) 6×	(6×) 12×	revision
Year 4	9×	7×	11× & revision	Squares	revision	Test: June
Year 5	(4×) 8 ×	(3×) 6×	9×	7×	Squares	revision
Year 6	All	All	All	All	All	All

Why a focus one TT per half term?
Plasticity of the brain: Neuroscientists tell us it takes approximately 8 weeks of repetition to make a new neural pathway with a myelin sheath - making this 'go to' automated thinking!

Step 2	Introduce a new times table focusing on previously known multiplication facts.

0x10=
1x10=
2x10=
3x10=
4x10=
5x10=
6x10=
7x10=
8x10=
9x10=
10x10=
11x10=
12x10=

This term you will be learning the 10 times table.

We have already learnt the 0,1,2 and 5s.

What facts do we already know?
Which ones do we need to learn?

Let's make a 'what comes in'.

- 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 will display this slide in the classroom and use it as a working document when children have learnt the new multiplication facts.
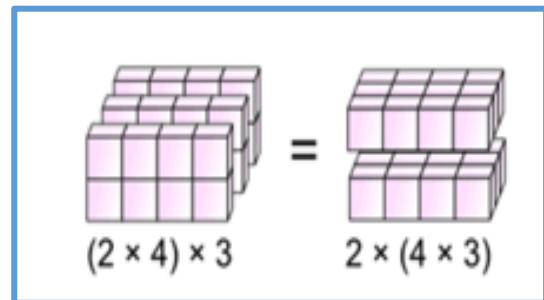
Step 3	Make clear conceptual links to real life- *'What comes in…?'* display.

- *'What comes in…?'* display to be seen across every classroom in years Rec-6.

- Displays are used to demonstrate examples of times tables in the real world. The display is to be introduced at the beginning of each times table and children should be invited to bring in their own evidence to add to the display. This display should stay up for the duration of the times table being learnt.

Step 4	Introduce a new times table using concrete, pictorial, abstract (CPA) approach for all children and using the array as a priority model.

$(2 \times 4) \times 3 \qquad 2 \times (4 \times 3)$

Making Arrays Real

Link to every day life – array walks, photos, displays

- 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.

Use of an array model will encourage understanding of all the properties of multiplication:

Commutative Law
Associative Law (can be split but must have equal groups)
Distributive Law (split but not equal groups, then added together)
Repeated addition
Inverse of division

Associative Law

Model One

2x(4x3)=24

(2x4)x3=24

Model Two

How many combinations?

Step 5	Use of consistent language across the whole school.

Language

Multiplicand x multiplier=product

5 x 3 = 15

5 is the concrete apparatus

3 is the abstract

5 books on 3 shelves. How many books are there?

5 x 3 = 15 books

Model/representations
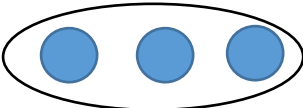
Chart representation should start with multiplicand

3x0

3x1

3x2

3x3
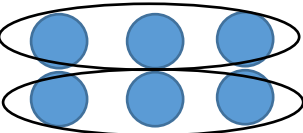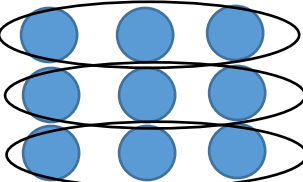
3x4

This language works with the following array representation:
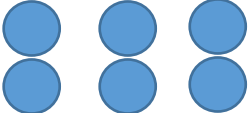

3x1 =

3x2=

3x3=

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 =

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 cup."

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 6	Develop a times table mastery and automaticity through use of variation and intelligent practice tasks.

- Children to achieve automaticity through the following practices…

1. Rapid recall.
2. Rapid recall with conceptual understanding.
3. High quality core activities.
4. Practise TT in order first, then variation.

- Children to also 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

MORE PATTERNS IN TABLES
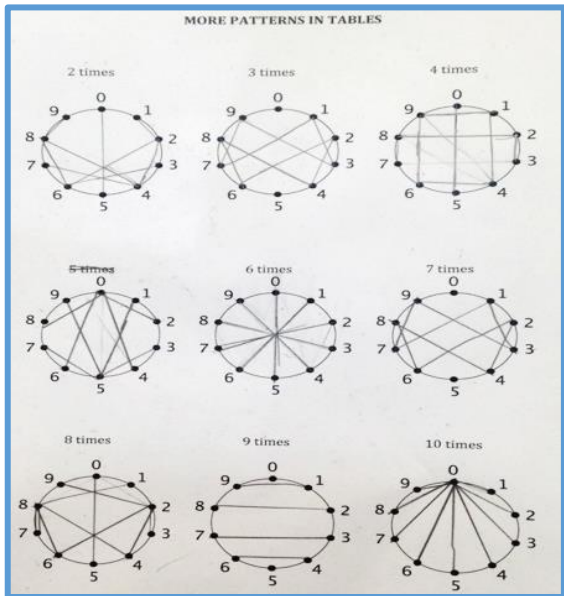
Step 7	Timetabled opportunities to practise times tables across years 2-6

- *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 3 days per week.

Step 8	Develop overarching mastery approach to Teaching and Learning of Times Tables