



Parkland
Primary School

Learning together

Fluency Policy

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Rationale

This policy outlines the main tools and resources to teach multiplication tables at Parkland Primary School.

Our Mission

At Parkland Primary School, we believe that every child in our school community should have *Limitless Learning* opportunities. We all have the ability to succeed and our school works hard to ensure that our pupils can *Discover their Potential*.

Our Values: Grow, Believe, Achieve, Succeed

Fluency

One of the three aims of the curriculum states that pupils (of all ages, not just primary children) will become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.

What is fluency from Nrich (2019)?

Students show computational fluency when they demonstrate flexibility in the computational methods they choose, understand and can explain these methods, and produce accurate answers efficiently.

Russell (2000) suggests that fluency consists of three elements:

Efficiency - this implies that children do not get bogged down in too many steps or lose track of the logic of the strategy. An efficient strategy is one that the student can carry out easily, keeping track of sub-problems and making use of intermediate results to solve the problem.

Accuracy depends on several aspects of the problem-solving process, among them careful recording, knowledge of number facts and other important number relationships, and double-checking results.

Flexibility requires the knowledge of more than one approach to solving a particular kind of problem, such as two-digit multiplication. Students need to be flexible in order to choose an appropriate strategy for the numbers involved, and also be able to use one method to solve a problem and another method to check the results.

Why do children need to be fluent?

To the person without number sense, arithmetic is a bewildering territory in which any deviation from the known path may rapidly lead to being totally lost. Dowker (1992)

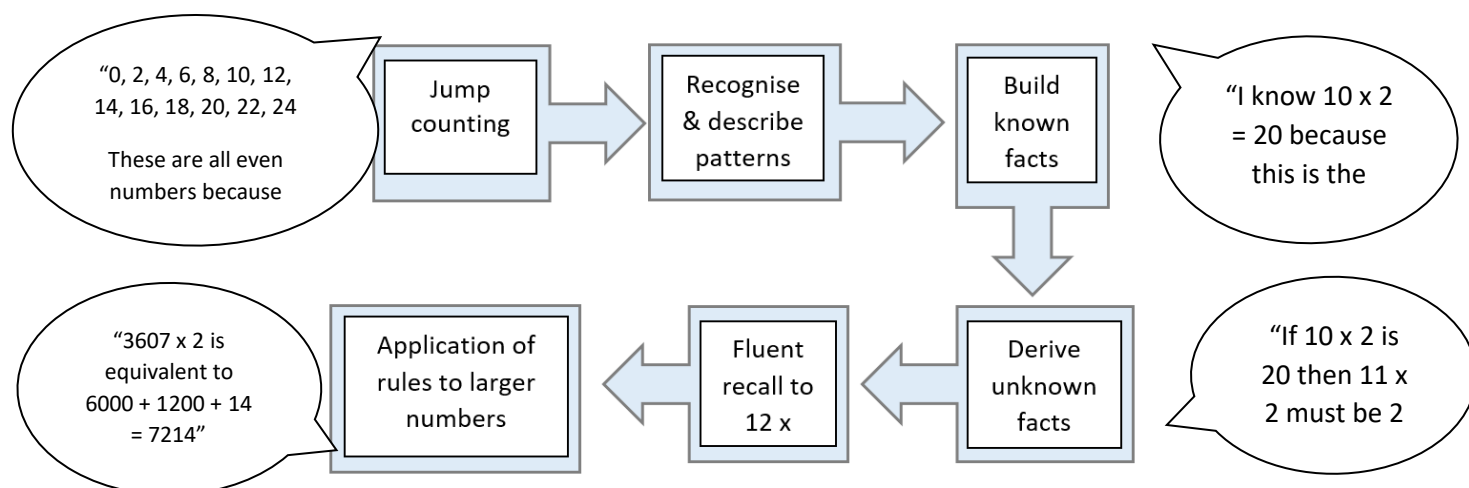
The phrase 'number sense' is often used to mean conceptual fluency - understanding place value and the relationships between operations. Children need to be both procedurally and conceptually fluent - they need to know both how and why. Children who engage in a lot of practice without understanding what they are doing often forget, or remember incorrectly, those procedures. Further, there is growing evidence that once students have memorised and practised procedures without understanding, they have difficulty learning later to bring meaning to their work (Hiebert, 1999).

On the other hand, conceptual fluency without procedural fluency can make the problem-solving process tortuous - children lose track of their thinking because they have to divert their energies into calculations which should be quick but aren't.

Overview

The National Curriculum expectation for UK Primary Schools is that, by the end of Year 4, pupils should be able to recall all 12 times tables, up to 12×12 . This scheme of work outlines the skills to be covered from Year 1 to Year 6, so that **all** year 4 pupils reach this age-related expectation and are able to use these skills to multiply larger numbers efficiently in year 5 and 6.

Children begin by learning to jump count, looking for and describing patterns in numbers. They then link repeated addition to multiplication and begin to build known facts, recognising the commutative law (i.e. that 10×3 is the same as 3×10). These known facts and counting strategies are then used to derive unknown facts, which are fluently recalled with enough practise. Finally, children begin to apply these skills to multiply larger numbers.



As well as expecting all children to learn the times table facts at speed, children will also be expected to understand the methodology behind them. This is to be taught within maths lessons. **Practising times tables is not sufficient to master these skills – children must be explicitly taught strategies to build their understanding.**

Teaching of Multiplication tables at Parkland Primary

At Parkland Primary, the teaching of the multiplication tables starts in KS1 and is built upon throughout the years.

Times tables

Times tables are taught from Year 1 at our school. Each year group has their set of statements that they teach.

In years 3 and 4, times tables are taught three times a week using a range of activities (see toolkit).

The expectations for teachers are to:

1) Use the times table you are learning as the multiplicand:

For the three times table you would use 3×5 because $3 \times$ (group size is 3 - **multiplicand**) 5 (**multiplier** - how many sets) so it reads as **3 multiplied by 5** (3 five times!)

If children don't know which is which, then when we come to more complex calculations where efficiency and flexibility is required for example 52×19 , they won't be able to efficiently work out known facts. For 52×19 , children will know that that 52 is what you are counting in (multiplicand), and to manipulate this, we can complete 52×20 (- 52).

2) Years 3 and 4 explicitly teach times tables three times a week in dedicated slots, using a range of activities

3) Years 4 and 5 are currently taking part in the Mastering Number Programme through the NCETM where they have 5 x 20 minute slots for times table teaching every day

5) KS2 classes use TTRS paper copies a minimum of three times a week (Year 2 to use them from teaching times tables in Spring/Summer)

5) Use of rolling numbers - <https://www.youtube.com/watch?v=d-WwTf78j4U>

6) Year 4 use the OUMTC on TTRS to practise their skills for the MTC

We use the following videos to support times table learning:

2 times table: https://youtu.be/6RHvIUry_uc

3 times table: <https://youtu.be/70aG99v704k?feature=shared>

4 times table: https://youtu.be/UJY1_fzM6Y

5 times table: https://youtu.be/LZAqhF_2vvs

6 times table: <https://youtu.be/zlNalPnOZoY>

7 times table: https://youtu.be/WdF_vFAxwas

8 times table: <https://youtu.be/dSnNkgMbtfs>

9 times table: <https://youtu.be/154VoUQbgvc>

10 times table: <https://youtu.be/5kwlccQGcr0>

11 times table: <https://youtu.be/p9AxbcO4Kp4>

12 times table: <https://youtu.be/PABb8HhmtEM>

Assessment of Times Tables

Years 2, 3 and 4 will use Times Tables Rockstars (TTRS) to assess and track children. The use of class and individual heat maps enable teachers to track children in their classrooms and identify any gaps in learning and then address this through whole class teaching and/ or interventions. An example of individual and class heat maps can be found below.

Year 4 Class Heat Map at the start of the year

	10	2	5	3	4	8	6	7	9	11	12
10	10 × 10	10 × 2	10 × 5	10 × 3	10 × 4	10 × 8	10 × 6	10 × 7	10 × 9	10 × 11	10 × 12
2	2 × 10	2 × 2	2 × 5	2 × 3	2 × 4	2 × 8	2 × 6	2 × 7	2 × 9	2 × 11	2 × 12
5	5 × 10	5 × 2	5 × 5	5 × 3	5 × 4	5 × 8	5 × 6	5 × 7	5 × 9	5 × 11	5 × 12
3	3 × 10	3 × 2	3 × 5	3 × 3	3 × 4	3 × 8	3 × 6	3 × 7	3 × 9	3 × 11	3 × 12
4	4 × 10	4 × 2	4 × 5	4 × 3	4 × 4	4 × 8	4 × 6	4 × 7	4 × 9	4 × 11	4 × 12
8	8 × 10	8 × 2	8 × 5	8 × 3	8 × 4	8 × 8	8 × 6	8 × 7	8 × 9	8 × 11	8 × 12
6	6 × 10	6 × 2	6 × 5	6 × 3	6 × 4	6 × 8	6 × 6	6 × 7	6 × 9	6 × 11	6 × 12
7	7 × 10	7 × 2	7 × 5	7 × 3	7 × 4	7 × 8	7 × 6	7 × 7	7 × 9	7 × 11	7 × 12
9	9 × 10	9 × 2	9 × 5	9 × 3	9 × 4	9 × 8	9 × 6	9 × 7	9 × 9	9 × 11	9 × 12
11	11 × 10	11 × 2	11 × 5	11 × 3	11 × 4	11 × 8	11 × 6	11 × 7	11 × 9	11 × 11	11 × 12
12	12 × 10	12 × 2	12 × 5	12 × 3	12 × 4	12 × 8	12 × 6	12 × 7	12 × 9	12 × 11	12 × 12

Individual Heat map

	10	2	5	3	4	8	6	7	9	11	12
10	10 x 10	10 x 2	10 x 5	10 x 3	10 x 4	10 x 8	10 x 6	10 x 7	10 x 9	10 x 11	10 x 12
2	2 x 10	2 x 2	2 x 5	2 x 3	2 x 4	2 x 8	2 x 6	2 x 7	2 x 9	2 x 11	2 x 12
5	5 x 10	5 x 2	5 x 5	5 x 3	5 x 4	5 x 8	5 x 6	5 x 7	5 x 9	5 x 11	5 x 12
3	3 x 10	3 x 2	3 x 5	3 x 3	3 x 4	3 x 8	3 x 6	3 x 7	3 x 9	3 x 11	3 x 12
4	4 x 10	4 x 2	4 x 5	4 x 3	4 x 4	4 x 8	4 x 6	4 x 7	4 x 9	4 x 11	4 x 12
8	8 x 10	8 x 2	8 x 5	8 x 3	8 x 4	8 x 8	8 x 6	8 x 7	8 x 9	8 x 11	8 x 12
6	6 x 10	6 x 2	6 x 5	6 x 3	6 x 4	6 x 8	6 x 6	6 x 7	6 x 9	6 x 11	6 x 12
7	7 x 10	7 x 2	7 x 5	7 x 3	7 x 4	7 x 8	7 x 6	7 x 7	7 x 9	7 x 11	7 x 12
9	9 x 10	9 x 2	9 x 5	9 x 3	9 x 4	9 x 8	9 x 6	9 x 7	9 x 9	9 x 11	9 x 12
11	11 x 10	11 x 2	11 x 5	11 x 3	11 x 4	11 x 8	11 x 6	11 x 7	11 x 9	11 x 11	11 x 12
12	12 x 10	12 x 2	12 x 5	12 x 3	12 x 4	12 x 8	12 x 6	12 x 7	12 x 9	12 x 11	12 x 12
NO DATA	0 - 1 s	1 - 2 s	2 - 3 s	3 - 4 s	4 - 5 s	5 - 6 s	6 - 7 s	7 - 8 s	8 - 9 s	9 - 10 s	> 10 s

Year 4

Year 4 will use the TTRS Officially Unofficial MTC (OUMTC), which are termly, mini mock MTCs run by Times Tables Rock Stars, which enable pupils to practise in semi test conditions. This enables teachers and the maths subject leaders to track pupils and classes and address gaps in learning.

This is along side continued use of TTRS online, daily where possible, and using TTRS paper copies.

TTRS suggest this schedule for year 4:



Year 3

Year 3 will use MathsFrame and TTRS Soundcheck to track pupils learning half termly to identify any gaps in learning and then address this through whole class teaching and/ or interventions. This is alongside continued use of TTRS online, daily where possible, and using TTRS paper copies.

Year 2

Year 2 will begin to use TTRS online and paper copies in Spring once multiplication and division have been taught. Year 2 will **not** use Soundcheck as they have not been taught these timestables. In the Summer term, Year 2 will use MathsFrame to assess their learning on the 2, 5 and 10 timestables.

Years 5 and 6

Years 5 and 6 will continue to do Soundchecks half termly which will enable teachers to track pupils learning half termly to identify any gaps in learning and then address this through whole class teaching and/ or interventions.

Whole School Times tables progression

	Year 1	Year 2	Year 3	Year 4
Autumn 1	<u>Count in multiples of 2</u> up to 24, linking with even numbers and supporting doubles .	Consolidate counting in multiples of 2, 5 and 10 in order from 0 up to 12x.	2, 5, 10 consolidation Understand that anything multiplied by zero is zero.	Consolidate the 2, 3, 4, 5, 6-, 8-, 9- and 10-times table.
Autumn 2			Understand that multiplied by 1 stays the same. 3 times table (keep 2, 5, 10)	
Spring 1	<u>Count in multiples of 10</u> in order up to 120	Recall multiples of 10 up to 10 x 12 in any order, including missing numbers and related division facts with growing fluency.	4, 8 times table (keep 2, 3, 5, 10)	Consolidate the 2, 3, 4, 5, 6, 8,9 10- and 11-times table. Teach 7 times table
Spring 2			6 times table (keep 2, 3,4, 5, 8, 10)	
Summer 1	<u>Count in multiples of 5</u> up to 60, linking with knowledge of counting in 10s.	Recall multiples of 5 up to 5 x 12 fluently, in any order.	9 times table (keep 2, 3,4, 5, 6, 8, 10)	Consolidate all
Summer 2		<u>Count in multiples of 3</u> to 3 x 12 in order from 0 with growing fluency.	2, 3, 4, 5, 6, 8,9 10 recap	MTC and consolidation

References and Links

[Times Tables Rock Stars – Times Tables Rock Stars \(trockstars.com\)](https://www.trockstars.com/)

[Multiplication Tables Check - Mathsframe](https://www.mathsframe.com/)

References

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