Times Tables Policy

We have a systematic approach to learning times tables which happens outside of the maths lesson and is a little and often approach. The approach aims to break down the learning of times tables into manageable steps and focuses on learning a specific times table at a time. Commutativity and the relationship between multiplication and division are an important aspect of the approach. The sound pattern of the times tables and rote learning is a feature of the systematic approach. It should be noted that conceptual understanding of times tables is developed within the main maths lesson.

Multiplicative facts are stored in our verbal memory; saying (and hearing) the sound pattern of the phrase (e.g. seven threes are twenty one) is important. This will inform how we develop the automatic recall of times tables facts with our children. We focus on 36 key facts to learn by rote using this sound pattern.

If multiplication facts are learnt and stored, rather than being calculated or by skip counting repeatedly, then they will require less activity from the brain, reducing the 'cognitive load' and essentially 'freeing up' space to focus brain activity on the application of the facts NOT the facts themselves. Dehaene, S. http://win.pisavisionlab.org/teaching/burr/piazzadehaene_chapgazzaniga.pdf

Overview of year group expectations

End of Key Stage 1	Year 3	Year 4	Year 5
• Repeated addition • Arrays • Understand multiplication is commutative • Skip count 2, 5, 10 • Some recall of 2, 5 and 10	• 2 times table • 5 times table • 10 times table • 3 times table	• 4 times table • 6 times table • 7 times table • 8 times table • 9 times table (11 times table) (12 times table)	• Continue over practising • Apply to related facts

Which facts will we learn by rote memorisation?

- Focus on 36 key facts outlined in the DfE Mathematics guidance: key stages 1 and 2 - see below
- Fluency in these facts should be prioritised because, when coupled with an understanding of commutativity and fluency in the formal written method for multiplication, they enable pupils to multiply any pair of numbers.

Multiplication and division facts

The full set of multiplication calculations that pupils need to be able to solve by automatic recall are shown in the table below. Pupils must also have automatic recall of the corresponding division facts.

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

Pupils must be fluent in these facts by the end of year 4, and this is assessed in the multiplication tables check. Pupils should continue with regular practice through year 5 to secure and maintain fluency.

Why will we not learn all facts up to 12 x 12 by rote memorisation?

- 1 times table – children will learn in KS1 that multiplying a number by 1 results in the product being the same as the number being multiplied by 1
- 11 and 12 times tables do not support with short multiplication or division and can be derived using other facts
- 10 times table can be easy to learn and spot the pattern – children often pick these facts up quickly
- Commutative law enables children to see that 2 x 3 is equal to 3 x 2
- The 36 facts highlighted recognises the commutative law
- The 36 facts start with the higher number e.g. 3 x 2 rather than 2 x 3

How will we learn these facts?

- When introducing a new times table, the teacher will write the facts out from 1 – 12 to enable children to see the whole times table with the corresponding division facts
- Remember not all facts will need to be learned by rote memorisation
- As a class identify which facts we know already and which will be new for example:

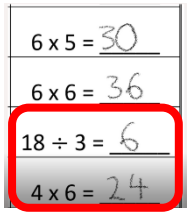
1 x 6	Know 1 times table
2 x 6	Already learnt 6 x 2
3 x 6	Already learnt 6 x 3
4 x 6	Already learnt 6 x 4
5 x 6	Already learnt 6 x 5
6 x 6	New fact
7 x 6	New fact
8 x 6	New fact
9 x 6	New fact
10 x 6	Know 10 x pattern
11 x 6	11- and 12-times tables do not support with short multiplication or division and can be derived using other facts
12 x 6	

- Use the sound pattern, starting with the larger number to learn new facts e.g. *seven sixes are forty-two*
- Repetition of saying the fact using the sound pattern
- Limit thinking as thinking can hinder recall of sound pattern – children can start to overanalyse
- Due to repetition of sound pattern children can often say the fact in this way without realising it has been committed to memory
- Learn a new fact one at a time e.g. one a day
- Learn the fact as a sound pattern starting with the larger number e.g. 4 x 6 = 24 becomes six fours are twenty-four.
- Times table practise booklets used daily
- Each booklet has 22 sets of practise questions – these are carefully built up

Practise questions 1 – 4	Practise questions 5 – 8	Practise questions 9 – 12	Practise questions 13 – 22
First part of the new times table	Second part of the new times table	The whole of the new times table	New times table mixed with previously learnt times tables

- Children complete the test twice on most days
- Children are given 2 minutes to see how many questions they can answer
- Times table being learnt should be always on display in the classroom
- Children may begin by using this to copy the answers from display – this will help them to become familiar with the facts
- Scores are likely to be low to begin with and children should know this is ok
- Gradually children will copy less and learn more facts and scores increase
- Celebrate induvial progress e.g. who got more than their score yesterday?
- Practise questions are marked together and used as a learning opportunity
- Overall time should be 7 minutes

How do we mark practice questions?



- Teacher says the fact, children repeat the fact back – this is where the repetition is key
- Facts are not always said as they appear – e.g. the ones circled in red
- Facts should always be linked back to the core 36 facts
- Say the larger number first e.g. six fives are 30, six sixes are 36
- This helps link the sound pattern to the 36 facts
- Where there is a division fact it would be said as 'mmmm threes are 18, six threes are 18' to help link the sound pattern to the corresponding division facts

Times Tables Booklets – summary

- Order of booklets: learn the times tables in this order: 2, 5, 3, 4, 6, 7, 8, 9.
- We spend lots of time securing facts to 9 x 9, as these are the building blocks they need in Y5 and Y6 to do any written algorithm
- There is a stand alone book for the 10 times table (which obviously comes earlier in the sequence).
- There are stand alone books for the 11 and 12 times table, which need to be done for the Y4 times table check. These do not include division facts.
- There is a mixed practice booklet for all times tables up to 12 x 12 which can be used before the check. In line with the check, this does not include division facts.
- With the above exceptions, we include division facts in the booklets (about 1 in 5 questions is a division question) as it is so helpful for children in terms of understanding the inverse relationship between multiplication and division. However there are not going to be division facts in the Y4 check.
- The booklets for times tables 2 – 5 and 10 include only division by that times table (e.g.16 ÷ 2 but not 16 ÷ 8 in 2 times table) as this supports understanding of division by grouping. By the time children get to the 6, 7, 8 and 9 times table they should have a good understanding of both grouping and sharing so e.g. both 54 ÷ 6 and 54 ÷ 9 are included in the 6 times table booklet.

What do we do if a child is new to school or struggling to keep up?

- Identify quickly which facts they are struggling with and try to unpick the barrier
- Write the facts on individual cards and use conferencing to sort them in to known and not know facts
- 1:1 system intervention
    - Guidance provided to parents as to how they can support the individual's learning.
    - Start by conferencing the child to identify the number facts they can recall/known facts (green) and unknown facts (red).
    - They then pick two **different** unknown facts and use them as a bookmark to self-test before reading.

Principles

1. Learn as a memorised phrase by repeating sound pattern out loud. Don't try to derive. If you don't know – copy down then learn later.

2. Learn each fact one way round only, then get confident at switching factors.
3. Don't think! (about the only time in maths when thinking is unhelpful!) When trying to recall a fact, say the WHOLE number sentence out loud and see if the answer trips off your tongue. If not, try the commutative and see if it comes then.
4. Learn one new fact at a time. Don't try to learn the whole times table at once.

Possible approach

Day 1	Day 2	Day 3	Day 4 onwards
Introduce the new times table Write out times table 1-12 Identify known facts Identify new facts Use sound patterns to go through times tables I say…you say… Ensure times tables are displayed *It may be easier to just display the times table you are learning	Refer to times tables and introduce one new fact including division way I say, you say…	Practise set of question 1 – 2 minutes Mark answers and use sound pattern/repetition I say… you say – 5 minutes Practise set of question 2 – 2 minutes Mark answers and use sound pattern/repetition I say… you say – 5 minutes	Continue introduce one new fact including division way I say, you say… and working through booklet – two practise a day

Year 4 overview (2022/23)

		M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T
Sep	2 TT and 5TT								5	6 2x2	7	8 3x2	9 4x2	10	11	12	13 5x2	14	15 6x2	16 7x2	17	18	19	20 8x2	21	22 9x2	23	24	25	26	27 3x5	28	29 4x5	30 5x5					
Oct	5TT and 3 TT						1	2	3	4 6x5	5	6 7x5	7 8x5	8	9	10	11 9x5	12	13	14	15	16	17	18 3x3	19	20 4x3	21 6x3	22	23	24	25	26	27	28	29	30	31	
Nov	3TT, 4TT and 6TT		1 7x3	2	3 8x3	4 9x3	5	6	7	8 4x4	9	10 6x4	11 7x4	12	13	14	15 8x 4	16	17 9x4	18	19	20	21	22 6x6	23	24 7x6	25 8x6	26	27	28	29 9x6	30							
Dec	6TT and 8TT				1	2	3	4	5	6 8x 8	7	8 9x8	9 8x6	10	11	12	13 9x6	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31				
Jan	7TT, 9TT and 11TT							1	2	3 7x7	4	5 8x7	6 9x7	7	8	9	10	11	12	13	14	15	16	17 9x9	18	19	20	21	22	23	24	25	26	27	28	29	30	31 11x11
Feb	11TT and 12TT			1	2 12x 11	3	4	5	6	7 12 x2	8	9 12 x3	10 12 x4	11	12	13	14	15	16	17	18	19	20	21 12 x5	22	23 12 x6	24 12 x7	25	26	27	28 12 x8								
Mar	12 TT and Mix			1	2 12 x9	3 12 x11	4	5	6	7 12 x12	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31				
Apr	Mix						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
May	Mix	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31						

June	MTC check		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
July	Interventions				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21							

Note: 1 x and 10 x revised in Maths Meetings

2 times table – new facts		5 times table – new facts		3 times table – new facts	
2 x 2 = 4	Two twos are four	3 x 5 = 15	Five threes are fifteen	3 x 3 = 9	Three threes are nine
3 x 2 = 6	Three twos are six	4 x 5 = 20	Five fours are twenty	4 x 3 = 12	Four threes are twelve
4 x 2 = 8	Four twos are eight	5 x 5 = 25	Five fives are twenty-five	6 x 3 = 18	Six threes are eighteen
5 x 2 = 10	Five twos are ten	6 x 5 = 30	Six fives are thirty	7 x 3 = 21	Seven threes are twenty-one
6 x 2 = 12	Six twos are twelve	7 x 5 = 35	Seven fives are thirty-five	8 x 3 = 24	Eight threes are twenty-four
7 x 2 = 14	Seven twos are fourteen	8 x 5 = 40	Eight fives are forty	9 x 3 = 27	Nine threes are twenty-seven
8 x 2 = 16	Eight twos are sixteen	9 x 5 = 45	Nine fives are forty-five		
9 x 2 = 18	Nine twos are eighteen				
8 new facts		7 new facts		6 new facts	

4 times table – new facts		6 times table – new facts		8 times table – new facts	
4 x 4 = 16	Four fours are sixteen	6 x 6 = 36	Six sixes are thirty-six	8 x 8 = 64	Eight eights are sixty-four
6 x 4 = 24	Six fours are twenty-four	7 x 6 = 42	Seven sixes are forty-two	9 x 8 = 72	Nine eights are seventy-two
7 x 4 = 28	Seven fours are twenty-eight	8 x 6 = 48	Eight sixes are forty-eight		
8 x 4 = 32	Eight fours are thirty-two	9 x 6 = 54	Nine sixes are fifty-four		
9 x 4 = 36	Nine fours are thirty six				
5 new facts		4 new facts		2 new facts	

7 times table – new facts	9 times table – new facts

7 x 7 = 49	Seven sevens are forty-nine	9 x 9 = 81	Nine nines are eighty-one
8 x 7 = 56	Eight sevens are fifty-six		
9 x 7 = 63	Nine sevens are sixty-three		
3 new facts		1 new fact	

11 times table – new facts		12 times table – new facts	
11 x 2 = 22	Eleven twos are twenty-two	12 x 2 = 24	Twelve twos are twenty-four
11 x 3 = 33	Eleven threes are thirty-three	12 x 3 = 36	Twelve threes are thirty-six
11 x 4 = 44	Eleven fours are forty-four	12 x 4 = 48	Twelve fours are forty-eight
11 x 5 = 55	Eleven fives are fifty-five	12 x 5 = 60	Twelve fives are sixty
11 x 6 = 66	Eleven sixes are sixty-six	12 x 6 = 72	Twelve sixes are seventy-two
11 x 7 = 77	Eleven sevens are seventy-seven	12 x 7 = 84	Twelve sevens are eighty-four
11 x 8 = 88	Eleven eights are eighty-eight	12 x 8 = 96	Twelve eights are ninety-six
11 x 9 = 99	Eleven nines are ninety-nine	12 x 9 = 108	Twelve nines are one hundred and eight
11 x 11 = 121	Eleven elevens are one hundred and twenty-one	12 x 11 = 132	Twelve elevens are one hundred and thirty-two
		12 x 12 = 144	Twelve twelves are one hundred and forty-four
9 new facts		10 new facts	

Summary

36 facts to take us up to 9 x 9 – **the building block facts**

Year 3	Year 3	Year 3	Year 4	Year 4	Year 4	Year 4	Year 4
2 x	5 x	3 x	4 x	6 x	7 x	8 x	9 x
2 x 2							
3 x 2	3 x 5	3 x 3					
4 x 2	4 x 5	4 x 3	4 x 4				
5 x 2	5 x 5						
6 x 2	6 x 5	6 x 3	6 x 4	6 x 6			
7 x 2	7 x 5	7 x 3	7 x 4	7 x 6	7 x 7		
8 x 2	8 x 5	8 x 3	8 x 4	8 x 6	8 x 7	8 x 8	
9 x 2	9 x 5	9 x 3	9 x 4	9 x 6	9 x 7	9 x 8	9 x 9
8 facts	7 facts	6 facts	5 facts	4 facts	3 facts	2 facts	1 fact
By end of Y3: 21 facts learnt 15 facts still to learn			By end of Y4 15 facts learnt to complete building blocks 21 more facts for times table check (see below)				

Year 4: 21 more facts

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

Year 4 overview – implementation year only (2021-22)

holidays

		M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S
Sep	Intro 2x and 5x			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3
Oct	Intro 3x	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31							
Nov	Intro 4x 6x 8x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5
Dec	Intro 7x 9x	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2							
Jan	Intro 11x	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30							
Feb	Intro 12x	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27							
Mar	Testing of all tables	28	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3

Apr		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1									
May		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	29	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5		
June	MTC from 6th - 24th June	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3									
July	Testing of all tables	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31									

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	12 x 12 = 144	Twelve twelves are one hundred and forty-four
9 new facts	10 new facts	