Learning Tables Facts by End of Year 4

Jo Lees

July 2018

Final Version

© Hampshire County Council

Overview

In this document
This document provides an overview of progression in the learning of times tables facts for Y1 to Y4.

Points to consider when using this resource
Teachers should expand the examples offered in this resource and make sure that they include multiple representations, models and images to support all learning preferences.

| Year 1	Enrichment	National Curriculum and Non-Statutory Guidance
By M1 • Counting in 2s • Linking 'adding 2s' eg 2+2+2 to counting By M2 • Counting in 2s ,**10s** • Linking 'adding multiples of 2' to **'lots of 2, groups of 2' language to solve practical problems** • **Linking 'adding multiples of 10' to 'lots of 10, groups of 10' language to solve practical problems, pictorial recording and repeated addition eg 10+10+10** By M3 • Counting in 2s, 10s and **5s** • **Linking 'adding multiples of 5' to 'lots of 5, groups of 5' language to solve practical problems, pictorial recording and repeated addition eg 5+5+5** By M4 • Counting in 2s, 10s and 5s • Linking 'adding in multiples of' 2,10,5 to solving practical problems *Assessment needs to accurately focus on which multiples individual pupils 'forget' or 'miss' when counting.*	• Missing number problems to develop reasoning (if I know this what else do I know?) • Counting on from any multiple of two (ten)	By the end of Year 1 pupils should be taught to: • Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher. **Notes and guidance (non-statutory)** Through grouping and sharing small quantities, pupils begin to understand: • Multiplication and division • Doubling numbers and quantities • Finding simple fractions of objects, number and quantities. They make connections between arrays, number patterns and counting in twos, fives and tens.

6 socks – how many pairs?

If there are 5 chocolates in a box how many boxes are needed for 15 chocolates?

(Year 1 and) Year 2	Enrichment	National Curriculum and Non-Statutory Guidance
By M1 • Tables facts for 2s,5s,10s • Division facts for 2,10 By M2 • Tables facts for 2s,5s,10s • Write addition sentences as multiplication sentences 2s,10s **and 5s** • Division facts for 2,10 **and 5x** By M3 • Tables facts for 2s,10s,5s • Division facts for 2,10,5x By M4 • Counting in 2s,5s,10s **and 3s** • Multiplication and Division facts for • 2,5,10s • A look at picking out 'non-multiples' of 2, 10 and thinking about remainders of 1 or 2? *Assessment needs to accurately focus on which multiples individual pupils 'forget' or 'miss' when counting.*	• Missing number problems to make links with inverse operations • Multi representations of the same number fact (extending your 'repertoire' to broaden and deepen) • Counting on from any multiple of 5 • Independently able to create number stories about tables facts • Compare 5x and 10x facts to notice doubling eg 5x2, 10x2 etc.	By the end of Year 2 pupils should be taught to: • recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (✗), division (÷) and equals (=) signs • show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
		Notes and guidance (non-statutory) Pupils use a variety of language to describe multiplication and division. Pupils are introduced to the multiplication tables. They practise to become fluent in the 2, 5 and 10 multiplication tables and connect them to each other. They connect the 10 multiplication table to place value and the 5 multiplication table to the divisions on the clock face. They begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations. Pupils work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete quantities, to arrays and to repeated addition. They begin to relate these to fractions and measures (e.g. 40 ÷ 2 = 20, 20 is half of 40). They use commutativity and inverse relations to develop multiplicative reasoning (e.g. 4 x 5 = 20 and 20 ÷ 5 = 4).

5 frogs x 3 lily pads = 15 frogs

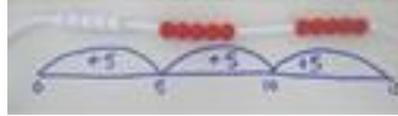| (Year 1, Year 2 and) Year 3	Enrichment	National Curriculum and Non-Statutory Guidance
By M1 • division facts for 2,5,10 • **tables facts for 3x** By M2 • division facts for 2,5,10 **and 3x** • **tables facts for 4x** By M3 • division facts for 2,5,10,3 **and 4x** • **tables facts for 8x** By M4 • division facts for 2,5,10,3,4 **and 8x** • **tables facts for 20x** *Assessment needs to accurately focus on which multiples individual pupils 'forget' or 'miss' when counting.*	• Look at 'non-multiples' of 2s,10s,5s using number lines, arrays and record as division facts with remainders of 1 or 2 e.g. 11÷2=5r1 • Look at counting in multiples of 20,50,30 and relate to multiples of 2,5,3 eg 3x5,30x5 • Look at division facts for 20x,30x,50x e.g. 200÷ 50= 4 • Look at 'non-multiples' of 20,30,50s with small remainders of 1,2,3 e.g. 503÷50= 10r3 • Look at patterns (show on number lines and bar models) e.g. 50x3=150; 51x3=153; 52x3=156 e.g. 503÷50=10r3; 504÷50=10r4	By the end of Year 3 pupils should be taught to: • Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables • Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know. **Notes and guidance (non-statutory)** Pupils continue to practise their mental recall of multiplication tables when they are calculating mathematical statements in order to improve fluency. Through doubling, they connect the 2, 4 and 8 multiplication tables. Pupils develop efficient mental methods, for example, using commutativity and associativity (e.g. 4 x 12 x5 = 4 x 5 x 12 = 20 = 240) and multiplication and division facts (e.g. using 3 x 2 = 6, 6 ÷ 3 = 2 and 2 = 6 ÷ 3) to derive related facts (e.g. 30 x 2 = 60, 60 ÷ 3 = 20 and 20 = 60 ÷ 3).
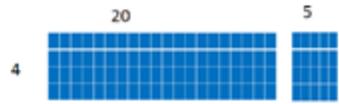
Use concrete resources (e.g. counters) to create arrays that show multiples of 3, 4 & 8 to support multiplication and division facts.

3 × 4   4 × 8

4 × 3   8 × 4

What do you notice about these pairs of table facts? Use arrays and number lines to support your ideas.

Use number lines and concrete resources (e.g. bead strings) to show multiples of 3, 4 & 8 that support multiplication and division facts.

x	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3		9	12	15	18	21	24	27	30	33	36
4			16	20	24	28	32	36	40	44	48
5				25	30	35	40	45	50	55	60
6					36	42	48	54	60	66	72
7						49	56	63	70	77	84
8							64	72	80	88	96
9								81	90	99	108
10									100	110	120
11										121	132
12											144

28 multiplication/division facts to learn in year 2 (x2, x5, x10)

+21 multiplication/division facts to learn in year 3 (x3, x4, x8)

+16 multiplication/division facts to learn in year 4 (x6, x7, x9, x11,x12)

(Year 1, Year 2, Year 3 and) Year 4	Enrichment	National Curriculum and Non-Statutory Guidance
By M1 • division facts 2,5,10,3,4,8x • **tables facts for 6x** By M2 • division facts 2,5,10,3,4,8,6x • **tables facts for 7x** By M3 • division facts 2,5,10,3,4,8,6 **and 7x** • **tables facts for 9x** (not already known), **11x and 12x** By M4 • division facts for 2,5,10,3,4,8,6,7,**9,11,12x** *Assessment needs to accurately focus on which multiples individual pupils 'forget' or 'miss' when counting.*	• Look at 'non-multiples' of 2s,10s,5s,3s,4s,8s and record as division facts with remainders of 1 or 2 eg 67 ÷8 = 8 r3 • Look at counting in multiples of 40,80,60 and relate to multiples of 4,8,6 e.g. 60x5/600 x5 • Look at division facts for 40x,80x,60x eg 240÷80/ 240÷60 • Look at 'non-multiples' of 40,80, 60 with small remainders of 1,2.3 e.g. 324÷80= 4r4 • Look at PV calculations linked to tenths after a unit of work on this Eg 5x7=35, 5x 0.7=3.5, 0.5x7= 3.5	By the end of Year 3 pupils should be taught to: • recall multiplication and division facts for multiplication tables up to 12 × 12 • use place value, known and derived facts to multiply and divide mentally, including: ○ multiplying by 0 and 1 ○ dividing by 1 ○ multiplying together three numbers • recognise and use factor pairs and commutativity in mental calculations **Notes and guidance (non-statutory)** Pupils continue to practise recalling and using multiplication tables and related division facts to aid fluency. Pupils practise mental methods and extend this to three-digit numbers to derive facts (e.g. 600 ÷ 3 = 200 can be derived from 2 x 3 = 6).

Use arrays to show multiples of 6, 7 and 9 to support multiplication and division facts. Use dienes to show multiples of 11 and 12.
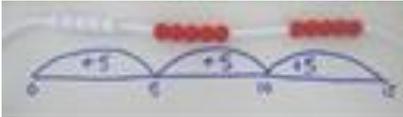
Use number lines and concrete resources (e.g. bead strings) to show multiples of 6, 7, 9, 11 & 12 to support multiplication and division facts.

Look at patterns and links between facts. Discuss how knowing one facts helps you to work out another

x	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3		9	12	15	18	21	24	27	30	33	36
4			16	20	24	28	32	36	40	44	48
5				25	30	35	40	45	50	55	60
6					36	42	48	54	60	66	72
7						49	56	63	70	77	84
8							64	72	80	88	96
9								81	90	99	108
10									100	110	120
11										121	132
12											144

28 multiplication/division facts to learn in year 2 (x2, x5, x10)
+21 multiplication/division facts to learn in year 3 (x3, x4, x8)
+16 multiplication/division facts to learn in year 4 (x6, x7, x9, x11, x12)

Use your knowledge of multiplication tables to complete these calculations.

$7 \times 6 =$

$7 \times 2 \times 3 =$

$8 \times 7 =$

$2 \times 4 \times 7 =$

$2 \times 2 \times 2 \times 7 =$

$12 \times 6 =$

$13 \times 6 =$

$12 \times 12 =$

$12 \times 13 =$

$12 \times 0 =$

Which calculations have the same answer? Can you explain why?

By the end of the year pupils should be fluent with all table facts up to 12 × 12 and also be able to apply these to calculate unknown facts, such as 12 × 13.

$2 \times 3 =$	$6 \times 7 =$	$9 \times 8 =$
$2 \times 30 =$	$6 \times 70 =$	$9 \times 80 =$
$2 \times 300 =$	$6 \times 700 =$	$9 \times 800 =$
$20 \times 3 =$	$60 \times 7 =$	$90 \times 8 =$
$200 \times 3 =$	$600 \times 7 =$	$900 \times 8 =$

HIAS Maths Team

Jo Lees – Area Inspector - Mathematics
Email: jo.lees@hants.gov.uk
Tel: 02380 816139

Jacqui Clifft – Area Inspector - Mathematics
Email: jacqui.clifft@hants.gov.uk
Tel: 02380 816139

Jenny Burn – Inspector/Adviser – Mathematics
Email: jenny.burn@hants.gov.uk
Tel: 01962 876207

Tessa Ingrey – Teaching & Learning Adviser – Mathematics (P/T)
Email: tessa.ingrey@hants.gov.uk
Tel: 01962 876207

Natalie Ivey – Inspector/Adviser – Mathematics (P/T)
Email: natalie.ivey@hants.gov.uk
Tel: 01962 876207

Dave Parnell – Teaching & Learning Adviser – Mathematics
Email: dave.parnell@hants.gov.uk
Tel: 01962 876207

Rebecca Reynolds – Teaching & Learning Adviser – Mathematics
Email: rebecca.reynolds@hants.gov.uk
Tel: 01962 876207

Brenda Robertson – Inspector/Adviser – Mathematics
Email: brenda.robertson@hants.gov.uk
Tel: 01962 876207

Kate Spencer – Teaching & Learning Adviser – Mathematics
Email: kathryn.spencer@hants.gov.uk
Tel: 01962 876207

For further details on the full range of services available please contact us using the following details:

Tel: 01962 874820 or email: hias.enquiries@hants.gov.uk

HTLC professional learning moodle

- Searchable course catalogue linked to the Learning Zone.
- Course updates.
- In-house training opportunities.
- Online calendar of events.
- Publications and online resources.
- Bespoke consultancy services.

Link: https://hias-totara.mylearningapp.com/

Hampshire
Services

HTLC TRAINING & DEVELOPMENT

Terms and conditions

Terms of license

Moodle+ subscribers are licensed to access and use this resource and have agreed to pay the annual subscription fee. This authority starts when the fee is paid and ends when the subscription period expired unless it is renewed. This file is for personal or classroom use only. By using it, you agree that you will not copy or reproduce this file except for your own personal, non-commercial use. HIAS have the right to modify the terms of this agreement at any time; the modification will be effective immediately and shall replace all prior agreements.

You are welcome to:
- download this resource
- save this resource on your computer
- print as many copies as you would like to use in your school
- amend this electronic resource so long as you acknowledge its source and do not share as your own work.

You may not:
- claim this resource as your own
- sell or in any way profit from this resource
- store or distribute this resource on any other website or another location where others are able to electronically retrieve it
- email this resource to anyone outside your school or transmit it in any other fashion.