A whole school approach to teaching times tables.

This document has been written in order to ensure consistency across the school with regards to the introduction and teaching of times tables

Aim

In 2018 the DfE published guidance for the Multiplication Tables Check (MTC). The MTC is to determine whether year 4 pupils can fluently recall their multiplication tables.

The national curriculum states, 'By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work'.

At Hawthorn we believe that children knowing their times tables is important to mathematical learning and understanding. The reasoning and learning that comes with understanding times tables can be applied across a wide range of topics within mathematics. We aim to take a broader approach to teaching times tables which will maximise a children's recall ability; reduce cognitive load, and help children to learn conceptually as well as procedurally.

Approach

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
YR1	Count in 1's	Equal and unequal groups	Count in 2s	Count in 5s	Count in 10s	Revision 2,5,10
YR2	X1	X2	X5	X10	Count in 3's	Revision
YR3	X4 (revise x2)	X8 (revise x4)	X3	X6 (revise x3)	Revision	Revision
YR4	X9 (revise x3)	X7	X11	X12 (revise x6)	Squares	Revision
YR5	Revision gaps	The curriculum assumes that all children enter Upper School with a firm understanding of the mental strategies needed to recall, manipulate and utilise their times tables fluently. Examples are included of how these earlier strategies may be applied and consolidated within the Year 5 and 6 curriculum and added examples of practical activities to support and reinforce these.				
YR6	Revision gaps					

Year 1 – 6 will engage in regular retrieval practice to develop fluency. This may be chanting, quick fire questions, TT Rockstars, missing number questions. KS2 children will access TTRockstars at home and compete in weekly challenges.

Teachers will dedicate 3 whole maths lessons every half term to explore each new times table. Children need to develop connections, explore patterns and create a deeper understanding of multiplicative reasoning. The NCTEM spine materials for multiplication and division will support planning.

There are 4 prerequisites which children must know about multiplication before they embark on learning times tables:

- Unitizing
- Understanding equal and unequal groups
- Combining equal groups
- Understand the early relationship between repeated addition and the times sign.

At Hawthorn the times table will be presented as:

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

When introducing a new times tables it will be done systematically building on the key facts that the children already know, e.g. when introducing the 8 times tables children will have already covered the 2,3,4,5 and 10 times tables. This leaves not too many 'new' facts to learn.

$0 \times 8 = 0$
$1 \times 8 = 8$
$2 \times 8 = 16$
$3 \times 8 = 24$
$4 \times 8 = 32$
$5 \times 8 = 40$
$6 \times 8 =$
$7 \times 8 =$
$8 \times 8 =$
$9 \times 8 =$
$10 \times 8 = 80$
$11 \times 8 =$
$12 \times 8 =$

Children will be given time to explore patterns within each new times table e.g. repeating digits, reversing digits, rules of divisibility and how lots of times tables relate to several other ones, e.g. 3,6 and 9.

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	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Children will explore how they can use facts they already know to find facts they don't know yet.

The use of the counting stick will be used in all classrooms, even in year 1 when they count in 2,5 and 10s.

6   ?

Each class will have a half termly display of 'what comes in..' to make clear conceptual links to the real world.

What comes in 3s?

When introducing a new times table a concrete, pictorial and abstract (CPA) approach will be used for ALL children, including the use of numicon and arrays.

5×6 = 6×5

4 x 6 = 24   6 x 4 = 24

Time will be given to deepen understanding through dedicated lessons which will allow children to explore patterns, relationships, make generalisations, problem solve and reason. Children will be able to represent multiplication facts in a variety of ways to help develop conceptual understanding.

3+3+3+3

4 x 3 =

0   3   6   9   12

12 ÷ 3 = 4

3 x 4

5x3-3

3 x 3 +3

4+4+4
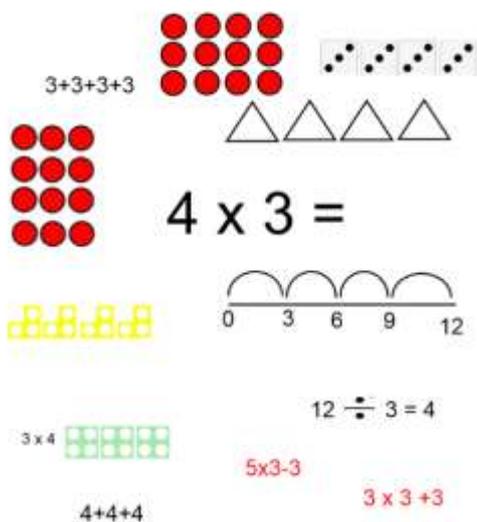
Teachers will develop mastery through the use of variation and through more intelligent practice. NCTEM spine materials offer a wide range of activities to develop depth and conceptual understanding.

Missing-number/symbol problems:

'Fill in the missing numbers.'

$3 \times 4 = 2 \times 4 + \boxed{}$ $\qquad$ $6 \times 4 = \boxed{} \times 4 + 4$

$3 \times 4 - \boxed{} = 2 \times 4$ $\qquad$ $6 \times 4 - 4 = \boxed{} \times 4$

'Fill in the missing symbols (<, > or =).'

$9 \times 4 \bigcirc 8 \times 4$

$9 \times 4 \bigcirc 8 \times 4 + 4$

Representing multiplication facts:

'Hari wrote this in his book.'

This shows $4 \times 8 = 32$

'Draw a picture like this to show:'

$7 \times 8 = 56$

Dòng nǎo jīn:

'Fill in the missing numbers.'

$20 \times 4 = 80$ $\qquad$ $4 \times 18 = 72$

so $\qquad\qquad$ so

$21 \times 4 = \boxed{}$ $\qquad$ $4 \times 19 = \boxed{}$

$15 \times 4 = 60$ $\qquad$ $4 \times 17 = 68$

so $\qquad\qquad$ so

$14 \times 4 = \boxed{}$ $\qquad$ $4 \times 16 = \boxed{}$

Dòng nǎo jīn:

'Some children are calculating how many legs there are on six spiders.'

Ben:
'I know that six eights are forty-eight'
$6 \times 8 = 48$

Akisha:
'Five times eight is forty, so six times eight is forty plus eight.'
$6 \times 8 = 5 \times 8 + 8$
$\qquad = 40 + 8$
$6 \times 8 = 48$

Tasha:
$6 \times 4 = 24$
double 24 = double 20 + double 4
$\qquad\qquad = 40 + 4$
$\qquad\qquad = 44$
so $6 \times 8 = 44$

Elliot:

$6 \times 8 = 56$

Mandy:

$6 \times 2 = \widehat{12}$

double $12 = 10 + 10 + 2 + 2$
$\qquad\qquad = 20 + 4$

$6 \times 4 = 24$

double $24 = 20 + 20 + 4 + 4$
$\qquad\qquad = 48$

$6 \times 8 = \widehat{48}$

- *'Who is right?'*
- *'Correct the ones that are wrong.'*
- *'Whose method do you like best? Why?'*