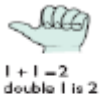
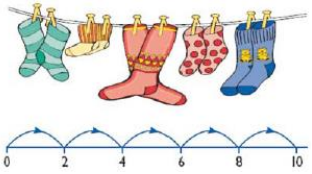
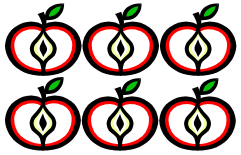
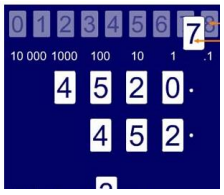
Newdale Primary school
Maths Calculation Policy - Multiplication

Rec	Rec into Year 1	Year 2	Year 3
Jumping along number lines in jumps of 1,2,5 & 10. Understand that multiplication is repeated addition, use practical equipment to understand. Be able to double numbers to 10. Know that multiplication is commutative so can be done in any order. Use practical apparatus to show doubles of numbers.  Use a number line to show repeated addition as a way to multiply –use concrete models to make the link.  *Pictures to show 2 lots of 3 or 3 lots of 2.*	KPI: Solve one step problems involving multiplication by calculating the answer using concrete objects, pictorial representations and arrays, with the support of the teacher. Count in 2s, 5s and 10s and begin counting in 3s. Show multiplication using pictures as repeated addition.  1 group of 3 = 3 and 2 groups of 3 = 6 3 x 2 =6 *three lots/groups of 2* Use apparatus to double numbers and quantities to 10. <u>Repeated Addition on a numberline</u> Recording repeated addition on a numberline. +3 +3 +3 0 3 6 9 Introduce the x symbol once repeated addition is understood. Understand patterns when dealing with multiples –	KPI: Recall and use multiplication facts for the 2, 5 and 10 times tables, including recognising odd and even numbers. Know tables facts 2s, 10s and 5s and begin counting in 3s and 4s Calculate mathematical statements for multiplication within the multiplication tables and write them using x and = Know that multiplication of two numbers can be done in any order (commutative). Solve problems involving multiplication using materials, arrays, repeated addition, mental methods and multiplication facts, including problems in context. Consolidate arras and repeated addition. 5 x 3 = 'I have 3 groups of 5, so I need 3 jumps on the numberline.' Understand what happens to a number when you multiply it by 10; be able to explain the movement of the digits. http://www.taw.org.uk/lic/itp/mov_digits.html  	KPI: Count from 0 in multiples of 4, 8, 50 and 100. Write and calculate mathematical statements for multiplication using the multiplication tables that they know, including 2-digit and 3 digit numbers x 1 digit numbers, using mental and progressing to written methods. Solve problems, including missing number problems, involving multiplication with corresponding problems in which *n* objects are connected to m objects. Recall and use multiplication facts for the 3,4 and 8 times tables, in addition to 2,3, 5 and 10 Be able to recall facts in any order. Multiply one and two digit numbers by 100, be able to explain the movement of the digits. Understand that multiplication can be done in any order/commutative law and it is the inverse of division. Informal recording of partitioned numbers 15 x 5 = 75 10 x 5 = 50 5 x 5 = 25 50 + 25 = 75 24 x 3 = 20 x 3 = 60 4 x 3 = 12 60 + 12 = 72

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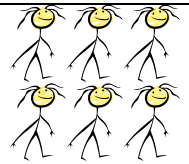


2 lots of 3 = 6
3 lots of 2 = 6

describe the pattern, what number will come next? Will 47 be in the pattern? Why? How do you know?

Use multiplication in a range of different contexts.

E.g. with money. Counting in 2,5,10ps using questions such as
- How many groups of 2ps make 14p?
- What is the value of 4 groups of 2ps?
With practical reinforcement.

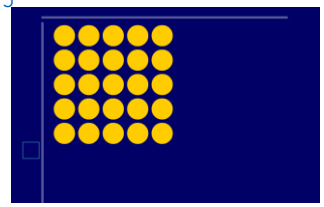
Array

'8 lots of 3'
'3 groups of 8'

*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*

Use ITP Multiarray facts to show arrays and different ways of recording.

http://www.mathsmap.co.uk/uploads/Image/Resources%20from%20Steps%20CD/level_3_4/downloads/multiarray.swf



Mastery check –

Captain Conjecture says, 'I can double any number, but I can only halve some numbers'.
Do you agree?

Explain your reasoning.

Show 19p using only 2p, 5p and 10p coins.

Find three different ways to do it.

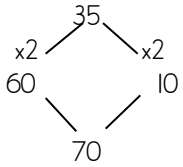
See NCETM materials for more examples

Know that doubles are the same as x2

Use accurate vocabulary including double, multiply, groups of, sets of, lots of.

Quick recall of facts.

Use partitioning as a strategy for doubling
Double 35 = 30 x 2 + 5 x 2



Develop this into
30 x 2 = 60
5 x 2 = 10

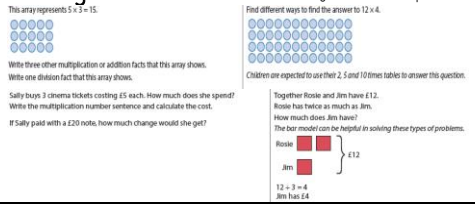
Recognise the use a symbols which are replacing unknown numbers and signs.

E.g. △ x 4 = 20
○ X 10 = 50

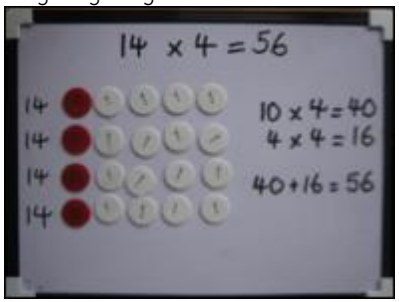
Link facts to number dials and dartboards – Wmnet Gordons

Application of multiplication facts in different contexts e.g. multiplication triangles (reinforcing division)

Mastery check – See NCETM materials for more examples



Use the grid method for multiplication when x 2digits by 1 digit numbers.



×	30	5
7	210	35

210 + 35 = 245

Use digit counters to support.

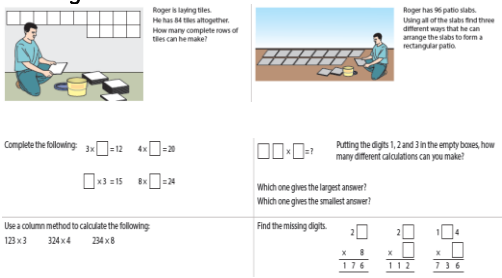
Extend to bigger numbers

146 x 9 = 1314

X	100	40	6
9	900	360	54

Addition to be done either mentally or across.

Mastery check –



See NCETM materials for more examples

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Year 4

KPI: Know table facts up to 12 x 12

Count in multiples of 6,7,9, 25 and 100.

Use place value, known derived facts to multiply mentally
- Including multiplying by 0 and 1
- Including multiplying together three numbers.

Recognise and use factor pairs and commutativity in mental calculations.

Solve problems, including missing number problems, involving multiplication with harder corresponding problems in which *n* objects are connected to m objects and including using the distributive law to multiply two-digit numbers by 1 digit and integer scaling problems.

Explain the effect of multiplying by 10 and 100

Partition TU x U, HTU x TU, HTU x HTU

Multiply 2 digit and 3 digit numbers by a 1 digit number using a formal written layout

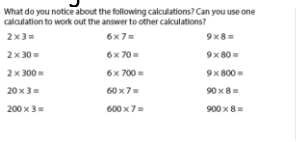
Consolidate grid method

146 x 9 = 1314

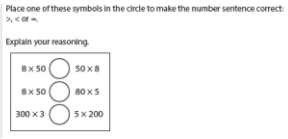
X	100	40	6
9	900	360	54

Move then onto longer multiplication using U

Mastery check –


What do you notice about the following calculations? Can you use one calculation to work out the answer to other calculations?

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


Place one of these symbols in the circle to make the number sentence correct: >, < or =.

Explain your reasoning.

8 × 50 ◯ 50 × 8

8 × 50 ◯ 80 × 5

300 × 3 ◯ 5 × 200

Year 5

KPI: Identify factors and multiples, including finding all factor pairs of a number and common factors of two numbers.

Solve problems involving multiplication where larger numbers are used by decomposing them into their factors.

Multiply numbers up to 4 digits by a 1 or 2 digit number, using a formal written method, including long multiplication for 2 digit numbers (Th HTU, HTU, TU x TU and U)

Multiply numbers mentally by drawing on known facts.

Multiply whole numbers and those involving decimals by 10, 100 and 1000.

Recognise and use square numbers and cube numbers.Solve problems involving multiplication, including their knowledge of factors, multiples, squares and cubes.

Know table facts up to 12 x 12

Short Multiplication

Progress into short when ready

78
x 42
16 (2 x 8)
140 (2 x 70)
320 (40 x 8)
2800 (40 x 70)
3276

78
x42
156
3120
3 276

346
x 9
54 (9 x 6)
360 (9 x 40)
2 700 (9 x 300)
3 1 1 4

Year 6

Know all times tables to 12 and corresponding divisions.
Children to choose suitable method for number size.
Children need to recognise and use cubed numbers up to 12 x 12

Long Multiplication (HTU x TU)

124 x 13 = 1612

X 1 2 4
1 3
3 7 2
1 2 4 0
1 6 1 2

Progress onto larger numbers. (HTU x HTU)

Least significant digit first.

124 x 26 becomes

	1	2	
	1	**2**	**4**
×		**2**	**6**
	7	**4**	**4**
2	**4**	**8**	**0**
3	**2**	**2**	**4**
1	1		

Answer: 3224

Decimals – Teach children to use known facts to build new facts, eg.
0.75 x 6
0.7 x 6 = 4.2
0.05 x 6 = 0.3
0.75 x 6 = 4.5

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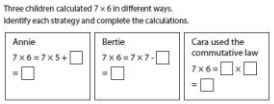
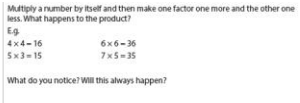




See NCETM materials for more examples.

Use short multiplication using **least significant digit first.**

24 × 6 becomes

$$\begin{array}{r} 2\ 4 \\ \times\ \ 6 \\ \hline 1\ 4\ 4 \\ \ \ 2 \end{array}$$

Answer: 144

342 × 7 becomes

$$\begin{array}{r} 3\ 4\ 2 \\ \times\ \ \ \ 7 \\ \hline 2\ 3\ 9\ 4 \\ \ \ 2\ 1 \end{array}$$

Answer: 2394

2741 × 6 becomes

$$\begin{array}{r} 2\ 7\ 4\ 1 \\ \times\ \ \ \ \ \ 6 \\ \hline 1\ 6\ 4\ 4\ 6 \\ \ \ 4\ 2 \end{array}$$

Answer: 16 446

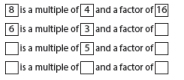
Long Multiplication

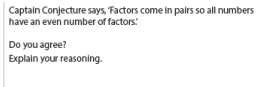
24 × 16 becomes

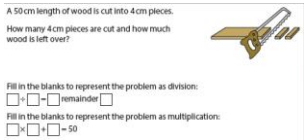
$$\begin{array}{r} \ \ 2 \\ 2\ 4 \\ \times\ 1\ 6 \\ \hline 2\ 4\ 0 \\ 1\ 4\ 4 \\ \hline 3\ 8\ 4 \end{array}$$

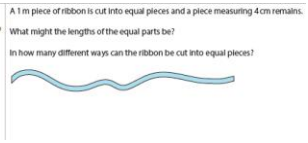
Answer: 384

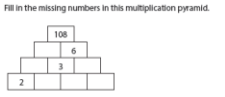
Mastery check –

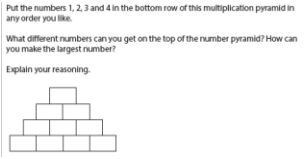






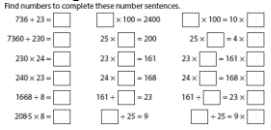


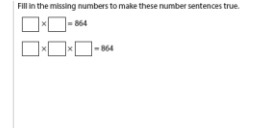


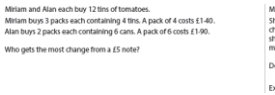


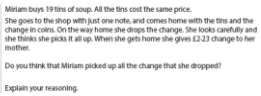
See NCETM materials for more examples.

Mastery check –









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