

Maths Mastery Policy



MULTIPLICATION

Reception:

EHLT are implementing Mastering Number at Reception in September 2024.

The programme aims to secure firm foundations in the development of good number sense for all children from Reception through to Year 1 and Year 2. The aim over time is that children will leave KS1 with fluency in calculation and a confidence and flexibility with number. Attention will be given to key knowledge and understanding needed in Reception classes, and progression through KS1 to support success in the future. Over the year, the children will experience using a range of resources and representations.

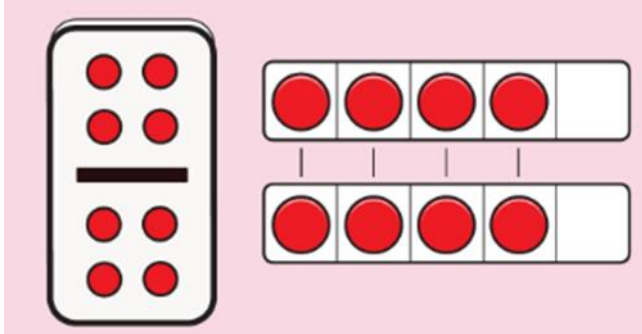
Research shows that children with secure 'number sense' early on will make more progress later on in maths and across the curriculum.

<u>MULTIPLICATION KEY VOCABULARY</u>					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Groups of; lots of; times; array; altogether; multiply; count	Groups of; lots of; times; array; altogether; multiply; count; multiplied by; repeated addition; factor	Groups of; lots of; times; array; altogether; multiply; count; multiplied by; repeated addition; column; row; commutative; sets of; equal groups; times as big as; once, twice, three times.; product; factor; grid method	Groups of; lots of; times; array; altogether; multiply; count; multiplied by; repeated addition; column; row; commutative; sets of; equal groups; times as big as; once, twice, three times.; product; factor; grid method; multiple; tens; ones; value; factor pair; approximate	Groups of; lots of; times; array; altogether; multiply; count; multiplied by; repeated addition; column; row; commutative; sets of; equal groups; times as big as; once, twice, three times.; product; factor; grid method; multiple; tens; ones; value; factor pair; approximate; integer; decimal; short/long multiplication; regroup	Groups of; lots of; times; array; altogether; multiply; count; multiplied by; repeated addition; column; row; commutative; sets of; equal groups; times as big as; once, twice, three times.; product; factor; grid method; multiple; tens; ones; value; factor pair; approximate; integer; decimal; short/long multiplication; regroup; tenths; hundredths

***This vocabulary is not an exhaustive list. Teachers will use recommended NCETM vocabulary in lessons.**

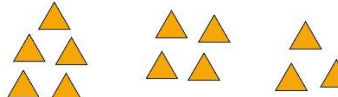
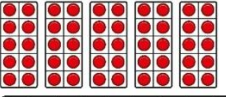
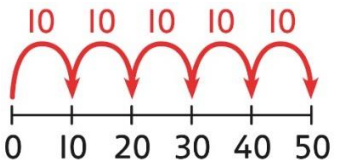
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RECEPTION MULTIPLICATION

	REAL-LIFE REPRESENTATION	OTHER REPRESENTATION
Making doubles	Children explore doubles in their environment including in games such as on dominoes or dice. They focus on the understanding of doubles being 2 equal groups.  <i>Double 4 is 8. Double 2 is 4. Double 3 is 6.</i>	Children use five frames to find doubles by lining up counters or cubes.  <i>Double 4 is 8.</i>

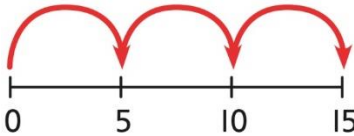
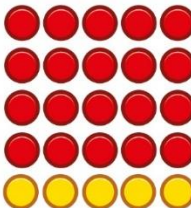
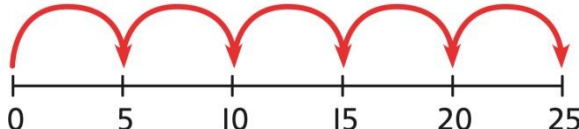
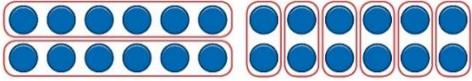
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YEAR 1 MULTIPLICATION

	CONCRETE	PICTORIAL	ABSTRACT																																																		
Recognising and making equal groups	Children arrange objects in equal and unequal groups and understand how to recognise whether they are equal. A  B  C 	Children draw and represent equal and unequal groups. A  B 	<i>Three equal groups of 4.</i> <i>Four equal groups of 3.</i>																																																		
Finding the total of equal groups by counting in 2s, 5s and 10s	 There are 5 pens in each pack ... 5...10...15...20...25...30...35...40...	100 squares and ten frames support counting in 2s, 5s and 10s.  <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr><tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr><tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr><tr><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td></tr><tr><td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td><td>47</td><td>48</td><td>49</td><td>50</td></tr></table>	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	Use a number line to support repeated addition through counting in 2s, 5s and 10s. 
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41	42	43	44	45	46	47	48	49	50																																												

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YEAR 2 MULTIPLICATION

	CONCRETE	PICTORIAL	ABSTRACT
Equal groups and repeated addition	Recognise equal groups and write as repeated addition and as multiplication.  <i>3 groups of 5 chairs 15 chairs altogether</i>	Recognise equal groups using standard objects such as counters and write as repeated addition and multiplication.  <i>3 groups of 5 15 in total</i>	Use a number line and write as repeated addition and as multiplication.  $5 + 5 + 5 = 15$ $3 \times 5 = 15$
Using arrays to represent multiplication and support understanding	Understand the relationship between arrays, multiplication and repeated addition.  <i>4 groups of 5</i>	Understand the relationship between arrays, multiplication and repeated addition.  <i>4 groups of 5 ... 5 groups of 5</i>	Understand the relationship between arrays, multiplication and repeated addition.  $5 \times 5 = 25$
Understanding commutativity	Use arrays to visualise commutativity.  <i>I can see 6 groups of 3. I can see 3 groups of 6.</i>	Form arrays using counters to visualise commutativity. Rotate the array to show that orientation does not change the multiplication.  <i>This is 2 groups of 6 and also 6 groups of 2.</i>	Use arrays to visualise commutativity.  $4 + 4 + 4 + 4 + 4 = 20$ $5 + 5 + 5 + 5 = 20$ $4 \times 5 = 20$ and $5 \times 4 = 20$

Maths Mastery Policy

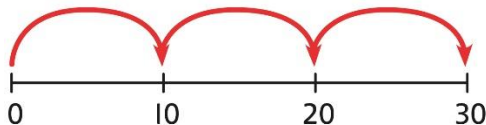
**Learning $\times 2$, $\times 5$
and $\times 10$ table
facts**

Develop an understanding of how to
unitise groups of 2, 5 and 10 and learn
corresponding times-table facts.



3 groups of 10 ... 10, 20, 30
 $3 \times 10 = 30$

Understand how to relate counting in
unitised groups and repeated
addition with knowing key times-
table facts.



$10 + 10 + 10 = 30$
 $3 \times 10 = 30$

Understand how the times-tables increase and contain
patterns.



$1 \times 10 = \square$



$2 \times 10 = \square$



$3 \times 10 = \square$



$4 \times 10 = \square$



$5 \times 10 = \square$



$6 \times 10 = \square$



$7 \times 10 = \square$



$8 \times 10 = \square$



$9 \times 10 = \square$



$10 \times 10 = \square$



$11 \times 10 = \square$

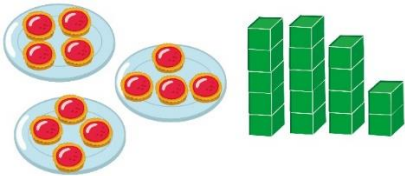
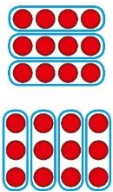
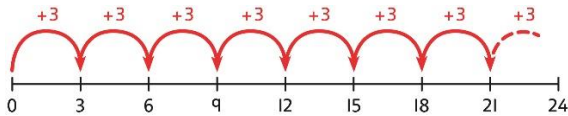
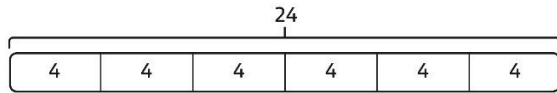


$12 \times 10 = \square$

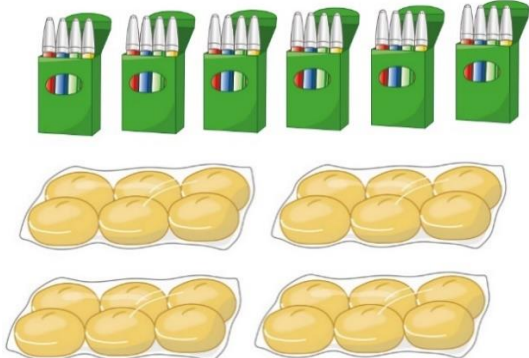
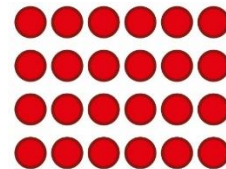
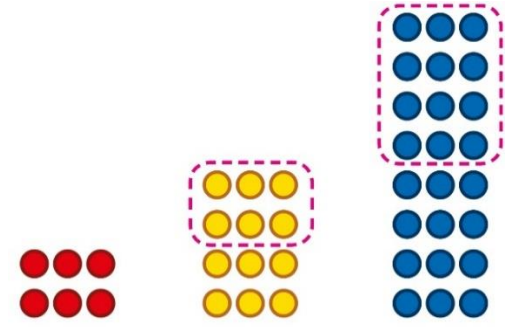
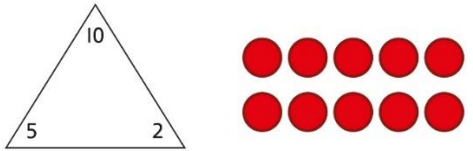
$5 \times 10 = 50$
 $6 \times 10 = 60$

Maths Mastery Policy

YEAR 3 MULTIPLICATION

	CONCRETE	PICTORIAL	ABSTRACT
Understanding equal grouping and repeated addition	Children continue to build understanding of equal groups and the relationship with repeated addition. They recognise both examples and non-examples using objects.  Children recognise that arrays can be used to model commutative multiplications.  <i>I can see 3 groups of 8. I can see 8 groups of 3.</i>	Children recognise that arrays demonstrate commutativity.  <i>This is 3 groups of 4. This is 4 groups of 3.</i>	Children understand the link between repeated addition and multiplication.  <i>8 groups of 3 is 24.</i> $3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 = 24$ $8 \times 3 = 24$ A bar model may represent multiplications as equal groups.  $6 \times 4 = 24$

Maths Mastery Policy

Using commutativity to support understanding of the times-tables	Understand how to use times-tables facts flexibly.  <i>There are 6 groups of 4 pens. There are 4 groups of 6 bread rolls. I can use $6 \times 4 = 24$ to work out both totals.</i>	Understand how times-table facts relate to commutativity.  $6 \times 4 = 24$ $4 \times 6 = 24$	Understand how times-table facts relate to commutativity. <i>I need to work out 4 groups of 7.</i> <i>I know that $7 \times 4 = 28$</i> <i>so, I know that</i> <i>4 groups of 7 = 28</i> <i>and</i> <i>7 groups of 4 = 28.</i>
Understanding and using $\times 3$, $\times 2$, $\times 4$ and $\times 8$ tables.	Children learn the times-tables as 'groups of', but apply their knowledge of commutativity.  <i>I can use the $\times 3$ table to work out how many keys.</i> <i>I can also use the $\times 3$ table to work out how many batteries.</i>	Children understand how the $\times 2$, $\times 4$ and $\times 8$ tables are related through repeated doubling.  $3 \times 2 = 6$ $3 \times 4 = 12$ $3 \times 8 = 24$	Children understand the relationship between related multiplication and division facts in known times-tables.  $2 \times 5 = 10$ $5 \times 2 = 10$ $10 \div 5 = 2$ $10 \div 2 = 5$

Maths Mastery Policy

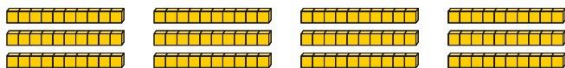
Using known facts to multiply 10s, for example 3×40

Explore the relationship between known times-tables and multiples of 10 using place value equipment.

Make 4 groups of 3 ones.

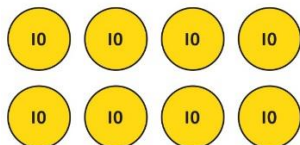
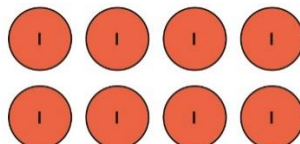


Make 4 groups of 3 tens.



*What is the same?
 What is different?*

Understand how unitising 10s supports multiplying by multiples of 10.

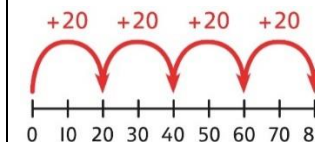
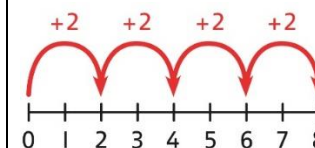


*4 groups of 2 ones is 8 ones.
 4 groups of 2 tens is 8 tens.*

$$4 \times 2 = 8$$

$$4 \times 20 = 80$$

Understand how to use known times-tables to multiply multiples of 10.



$$4 \times 2 = 8$$

$$4 \times 20 = 80$$

Maths Mastery Policy

Multiplying a 2-digit number by a 1-digit number

Understand how to link partitioning a 2-digit number with multiplying.

Each person has 23 flowers.

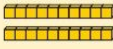
Each person has 2 tens and 3 ones.



There are 3 groups of 2 tens.

There are 3 groups of 3 ones.

Use place value equipment to model the multiplication context.

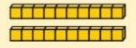
	T	O
		
		
		

There are 3 groups of 3 ones.

There are 3 groups of 2 tens.

Use place value to support how partitioning is linked with multiplying by a 2-digit number.

$$3 \times 24 = ?$$

T	O
	
	
	

$$3 \times 4 = 12$$

T	O
	
	
	

$$3 \times 20 = 60$$

$$60 + 12 = 72$$

$$3 \times 24 = 72$$

Use addition to complete multiplications of 2-digit numbers by a 1-digit number.

$$4 \times 13 = ?$$

$$4 \times 3 = 12$$

$$4 \times 10 = 40$$

$$12 + 40 = 52$$

$$4 \times 13 = 52$$

Maths Mastery Policy

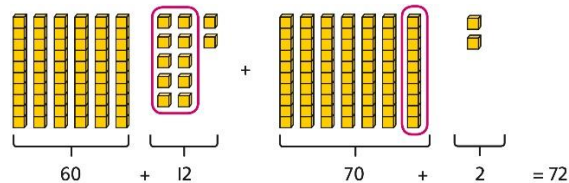
Multiplying a 2-digit number by a 1-digit number, expanded column method

Use place value equipment to model how 10 ones are exchanged for a 10 in some multiplications.

$$3 \times 24 = ?$$

$$3 \times 20 = 60$$

$$3 \times 4 = 12$$



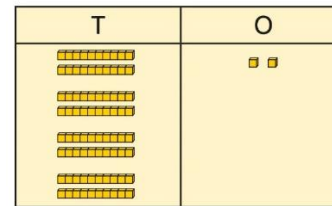
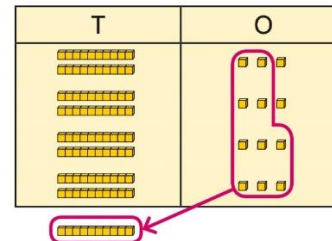
$$3 \times 24 = 60 + 12$$

$$3 \times 24 = 70 + 2$$

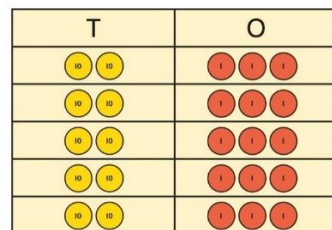
$$3 \times 24 = 72$$

Understand that multiplications may require an exchange of 1s for 10s, and also 10s for 100s.

$$4 \times 23 = ?$$



$$4 \times 23 = 92$$



$$5 \times 23 = ?$$

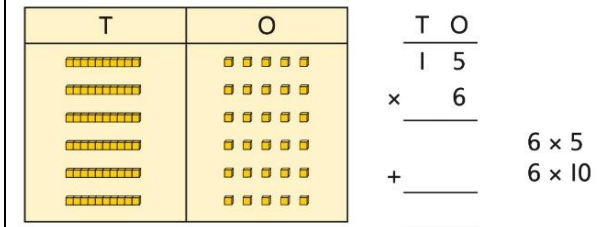
$$5 \times 3 = 15$$

$$5 \times 20 = 100$$

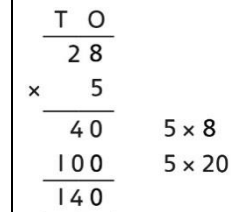
$$5 \times 23 = 115$$

Children may write calculations in expanded column form, but must understand the link with place value and exchange.

Children are encouraged to write the expanded parts of the calculation separately.

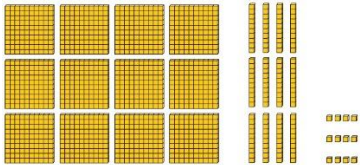
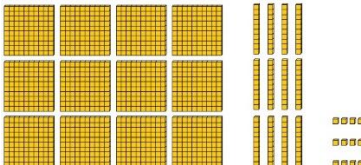
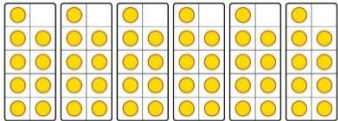
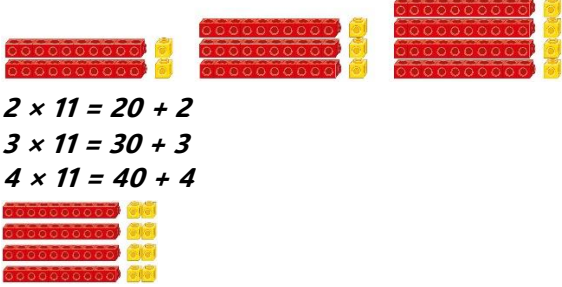
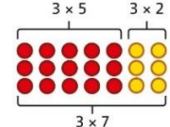


$$5 \times 28 = ?$$

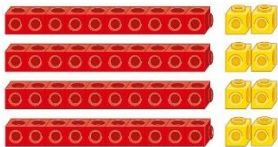
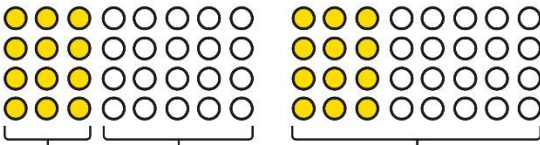
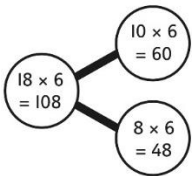
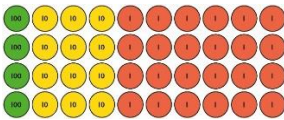
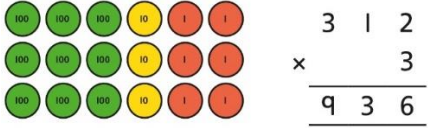
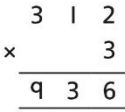
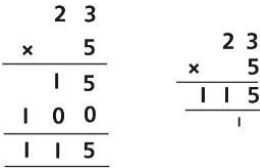


Maths Mastery Policy

YEAR 4 MULTIPLICATION

	CONCRETE	PICTORIAL	ABSTRACT
Multiplying by multiples of 10 and 100	Use unitising and place value equipment to understand how to multiply by multiples of 1, 10 and 100.  <i>3 groups of 4 ones is 12 ones. 3 groups of 4 tens is 12 tens. 3 groups of 4 hundreds is 12 hundreds.</i>	Use unitising and place value equipment to understand how to multiply by multiples of 1, 10 and 100.  $3 \times 4 = 12$ $3 \times 40 = 120$ $3 \times 400 = 1,200$	Use known facts and understanding of place value and commutativity to multiply mentally. $4 \times 7 = 28$ $4 \times 70 = 280$ $40 \times 7 = 280$ $4 \times 700 = 2,800$ $400 \times 7 = 2,800$
Understanding times-tables up to 12×12	Understand the special cases of multiplying by 1 and 0.  $5 \times 1 = 5$ $5 \times 0 = 0$	Represent the relationship between the $\times 9$ table and the $\times 10$ table.  Represent the $\times 11$ table and $\times 12$ tables in relation to the $\times 10$ table.  $2 \times 11 = 20 + 2$ $3 \times 11 = 30 + 3$ $4 \times 11 = 40 + 4$ $4 \times 12 = 40 + 8$	Understand how times-tables relate to counting patterns. Understand links between the $\times 3$ table, $\times 6$ table and $\times 9$ table 5×6 is double 5×3 $\times 5$ table and $\times 6$ table <i>I know that $7 \times 5 = 35$ so I know that $7 \times 6 = 35 + 7$.</i> $\times 5$ table and $\times 7$ table $3 \times 7 = 3 \times 5 + 3 \times 2$  $\times 9$ table and $\times 10$ table $6 \times 10 = 60$ $6 \times 9 = 60 - 6$

Maths Mastery Policy

Understanding and using partitioning in multiplication	Make multiplications by partitioning. <i>4 × 12 is 4 groups of 10 and 4 groups of 2.</i>  $4 \times 12 = 40 + 8$	Understand how multiplication and partitioning are related through addition.  $4 \times 3 = 12$ $4 \times 5 = 20$ $12 + 20 = 32$ $4 \times 8 = 32$	Use partitioning to multiply 2-digit numbers by a single digit. $18 \times 6 = ?$  $18 \times 6 = 10 \times 6 + 8 \times 6$ $= 60 + 48$ $= 108$
Column multiplication for 2- and 3-digit numbers multiplied by a single digit	Use place value equipment to make multiplications. <i>Make 4×136 using equipment.</i>  <i>I can work out how many 1s, 10s and 100s.</i> <i>There are 4×6 ones... 24 ones</i> <i>There are 4×3 tens ... 12 tens</i> <i>There are 4×1 hundreds ... 4 hundreds</i> $24 + 120 + 400 = 544$	Use place value equipment alongside a column method for multiplication of up to 3-digit numbers by a single digit.  $\begin{array}{r} 312 \\ \times 3 \\ \hline 936 \end{array}$	Use the formal column method for up to 3-digit numbers multiplied by a single digit.  Understand how the expanded column method is related to the formal column method and understand how any exchanges are related to place value at each stage of the calculation. 

Maths Mastery Policy

Multiplying more than two numbers

Represent situations by multiplying three numbers together.



Each sheet has 2×5 stickers.

There are 3 sheets.

There are $5 \times 2 \times 3$ stickers in total.

$$5 \times 2 \times 3 = 30$$

$$\underbrace{5 \times 2}_{10} \times 3 = 30$$

Understand that commutativity can be used to multiply in different orders.



$$2 \times 5 \times 10 = 120$$

$$12 \times 10 = 120$$

$$10 \times 6 \times 2 = 120$$

$$60 \times 2 = 120$$

Use knowledge of factors to simplify some multiplications.

$$24 \times 5 = 12 \times 2 \times 5$$

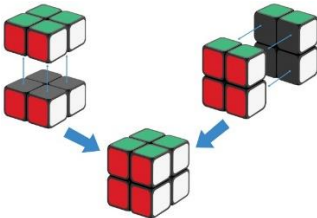
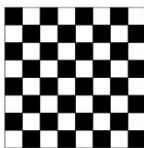
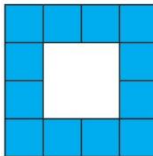
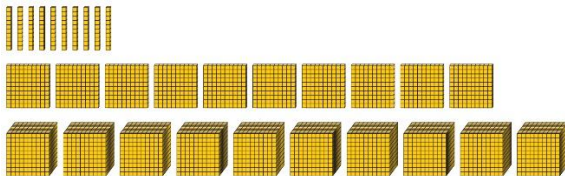
$$12 \times 2 \times 5 =$$

$$\underbrace{12 \times 2}_{24} \times 5 = 120$$

$$\text{So, } 24 \times 5 = 120$$

Maths Mastery Policy

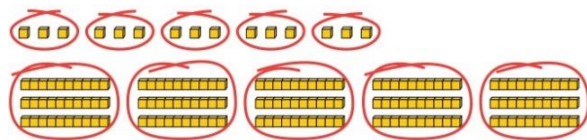
YEAR 5 MULTIPLICATION

	CONCRETE	PICTORIAL	ABSTRACT												
Understanding factors	Use cubes or counters to explore the meaning of 'square numbers'. <i>25 is a square number because it is made from 5 rows of 5.</i> Use cubes to explore cube numbers.  8 is a cube number.	Use images to explore examples and non-examples of square numbers.  $8 \times 8 = 64$ $8^2 = 64$  <i>12 is not a square number, because you cannot multiply a whole number by itself to make 12.</i>	Understand the pattern of square numbers in the multiplication tables. Use a multiplication grid to circle each square number. Can children spot a pattern?												
Multiplying by 10, 100 and 1,000	Use place value equipment to multiply by 10, 100 and 1,000 by unitising. <table><tr><td>$4 \times 1 = 4 \text{ ones} = 4$</td><td></td></tr><tr><td>$4 \times 10 = 4 \text{ tens} = 40$</td><td></td></tr><tr><td>$4 \times 100 = 4 \text{ hundreds} = 400$</td><td></td></tr></table>	$4 \times 1 = 4 \text{ ones} = 4$		$4 \times 10 = 4 \text{ tens} = 40$		$4 \times 100 = 4 \text{ hundreds} = 400$		Understand the effect of repeated multiplication by 10. 	Understand how exchange relates to the digits when multiplying by 10, 100 and 1,000. <table><tr><td>H</td><td>T</td><td>O</td></tr><tr><td></td><td>1</td><td>7</td></tr></table> $17 \times 10 = 170$ $17 \times 100 = 17 \times 10 \times 10 = 1,700$ $17 \times 1,000 = 17 \times 10 \times 10 \times 10 = 17,000$	H	T	O		1	7
$4 \times 1 = 4 \text{ ones} = 4$															
$4 \times 10 = 4 \text{ tens} = 40$															
$4 \times 100 = 4 \text{ hundreds} = 400$															
H	T	O													
	1	7													

Maths Mastery Policy

Multiplying by multiples of 10, 100 and 1,000

Use place value equipment to explore multiplying by unitising.



5 groups of 3 ones is 15 ones.

5 groups of 3 tens is 15 tens.

So, I know that 5 groups of 3 thousands would be 15 thousands.

Use place value equipment to represent how to multiply by multiples of 10, 100 and 1,000.



$$4 \times 3 = 12$$

$$4 \times 300 = 1,200$$

$$6 \times 4 = 24$$

$$6 \times 400 = 2,400$$

Use known facts and unitising to multiply.

$$5 \times 4 = 20$$

$$5 \times 40 = 200$$

$$5 \times 400 = 2,000$$

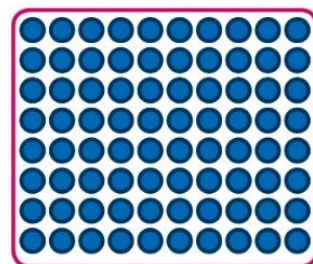
$$5 \times 4,000 = 20,000$$

$$5,000 \times 4 = 20,000$$

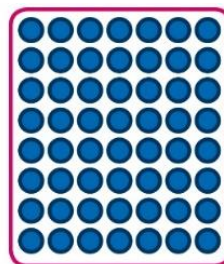
Multiplying up to 4-digit numbers by a single digit

Explore how to use partitioning to multiply efficiently.

$$8 \times 17 = ?$$



$$8 \times 10 = 80$$



$$8 \times 7 = 56$$

$$80 + 56 = 136$$

$$\text{So, } 8 \times 17 = 136$$

Represent multiplications using place value equipment and add the 1s, then 10s, then 100s, then 1,000s.

H	T	O
100	10 10 10 10 10 10	1 1 1
100	10 10 10 10 10 10	1 1 1
100	10 10 10 10 10 10	1 1 1
100	10 10 10 10 10 10	1 1 1
100	10 10 10 10 10 10	1 1 1

Use an area model and then add the parts.

100	60	3
5 $100 \times 5 = 500$	$60 \times 5 = 300$	$3 \times 5 = 15$

Use a column multiplication, including any required exchanges.

$$\begin{array}{r} 136 \\ \times 5 \\ \hline 680 \\ 1300 \\ 500 \\ \hline 6800 \end{array}$$

Maths Mastery Policy

Multiplying 2-digit numbers by 2-digit numbers

Partition one number into 10s and 1s, then add the parts.

$$23 \times 15 = ?$$



$$10 \times 15 = 150$$



$$10 \times 15 = 150$$



$$3 \times 15 = 45$$

There are 345 bottles of milk in total.

	H	T	O
	1	5	0
	1	5	0
+		4	5
	3	4	5
			1

$$23 \times 15 = 345$$

Use an area model and add the parts.

$$28 \times 15 = ?$$

	20 m	8 m																							
10 m	$20 \times 10 = 200 \text{ m}^2$	$8 \times 10 = 80 \text{ m}^2$	<table><tr><td>H</td><td>T</td><td>O</td></tr><tr><td>2</td><td>0</td><td>0</td></tr><tr><td>1</td><td>0</td><td>0</td></tr><tr><td></td><td>8</td><td>0</td></tr><tr><td></td><td>4</td><td>0</td></tr><tr><td>+</td><td></td><td></td></tr><tr><td></td><td>4</td><td>2</td><td>0</td></tr></table>	H	T	O	2	0	0	1	0	0		8	0		4	0	+				4	2	0
H	T	O																							
2	0	0																							
1	0	0																							
	8	0																							
	4	0																							
+																									
	4	2	0																						
5 m	$20 \times 5 = 100 \text{ m}^2$	$8 \times 5 = 40 \text{ m}^2$																							

$$28 \times 15 = 420$$

Use column multiplication, ensuring understanding of place value at each stage.

	3	4	
×	2	7	
	2	3	8
			34 × 7

	3	4	
×	2	7	
	2	3	8
	6	8	0
			34 × 20

	3	4	
×	2	7	
	2	3	8
	6	8	0
	9	1	8
			1

Maths Mastery Policy

Multiplying up to 4-digits by 2-digits

Use the area model then add the parts.

	100	40	3	Th	H	T	O
10				1	0	0	0
2				4	0	0	
				2	0	0	
				8	0		
				3	0		
				+	6		
				1	7	1	6

$$143 \times 12 = 1,716$$

There are 1,716 boxes of cereal in total.

$$143 \times 12 = 1,716$$

Use column multiplication, ensuring understanding of place value at each stage.

$$\begin{array}{r} 143 \\ \times 12 \\ \hline 286 \\ 1430 \\ \hline 1716 \end{array}$$

143 × 2
143 × 10
143 × 12

Progress to include examples that require multiple exchanges as understanding, confidence and fluency build.

$$1,274 \times 32 = ?$$

First multiply 1,274 by 2.

$$\begin{array}{r} 1274 \\ \times 32 \\ \hline 2548 \end{array}$$

1,274 × 2

Then multiply 1,274 by 30.

$$\begin{array}{r} 1274 \\ \times 32 \\ \hline 2548 \\ 38220 \\ \hline \end{array}$$

1,274 × 2
1,274 × 30

Finally, find the total.

$$\begin{array}{r} 1274 \\ \times 32 \\ \hline 2548 \\ 38220 \\ \hline 40768 \end{array}$$

1,274 × 2
1,274 × 30
1,274 × 32

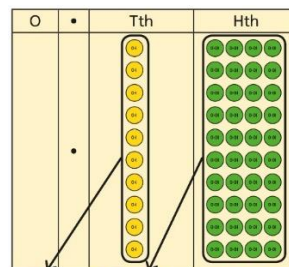
1,274 × 32 = 40,768

Maths Mastery Policy

**Multiplying
decimals by
10, 100 and
1,000**

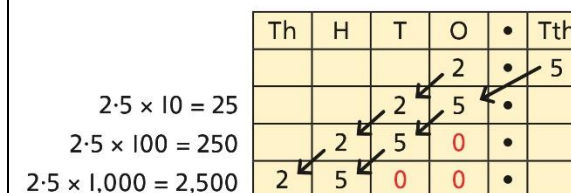
Use place value equipment to explore and understand the exchange of 10 tenths, 10 hundredths or 10 thousandths.

Represent multiplication by 10 as exchange on a place value grid.



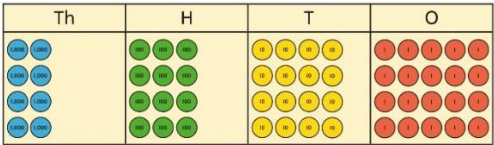
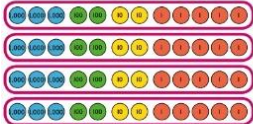
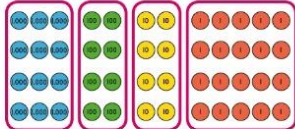
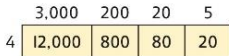
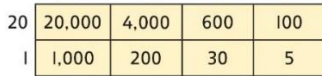
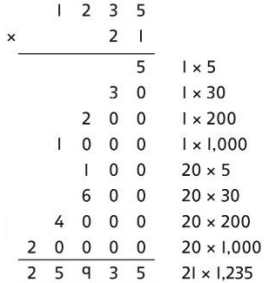
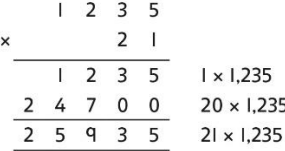
$$0.14 \times 10 = 1.4$$

Understand how this exchange is represented on a place value chart.



Maths Mastery Policy

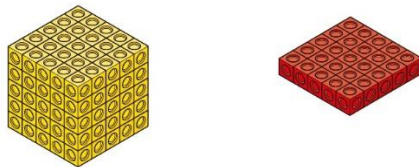
YEAR 6 MULTIPLICATION

	CONCRETE	PICTORIAL	ABSTRACT
Multiplying up to a 4-digit number by a single digit number	Use equipment to explore multiplications.  <i>4 groups of 2,345</i> <i>This is a multiplication:</i> $4 \times 2,345$ $2,345 \times 4$	Use place value equipment to compare methods. Method 1  Method 2  $4 \times 3,000 + 4 \times 200 + 4 \times 20 + 4 \times 5$ $12,000 + 800 + 80 + 20 = 12,900$	Understand area model and short multiplication. Compare and select appropriate methods for specific multiplications. Method 3  $12,000 + 800 + 80 + 20 = 12,900$ Method 4 
Multiplying up to a 4-digit number by a 2-digit number		Use an area model alongside written multiplication. Method 1  Method 2 	Use compact column multiplication with understanding of place value at all stages. 

Maths Mastery Policy

Using knowledge of factors and partitions to compare methods for multiplications

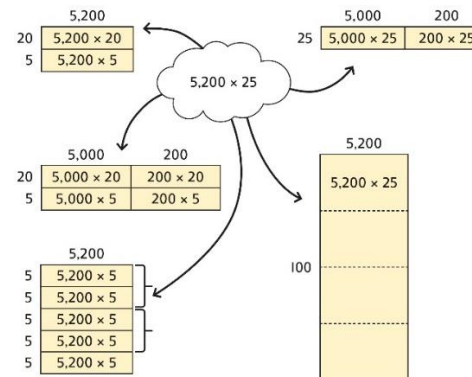
Use equipment to understand square numbers and cube numbers.



$$5 \times 5 = 5^2 = 25$$

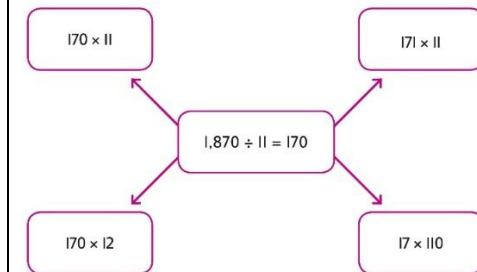
$$5 \times 5 \times 5 = 5^3 = 25 \times 5 = 125$$

Compare methods visually using an area model. Understand that multiple approaches will produce the same answer if completed accurately.



Represent and compare methods using a bar model.

Use a known fact to generate families of related facts.

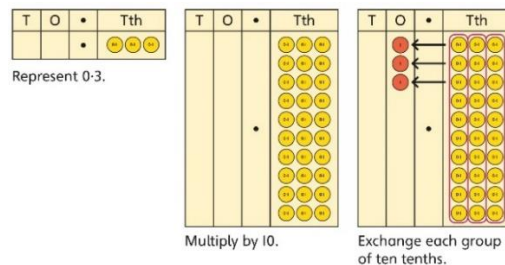


Use factors to calculate efficiently.

$$\begin{aligned} 15 \times 16 &= 3 \times 5 \times 2 \times 8 \\ &= 3 \times 8 \times 2 \times 5 \\ &= 24 \times 10 \\ &= 240 \end{aligned}$$

Multiplying by 10, 100 and 1,000

Use place value equipment to explore exchange in decimal multiplication.



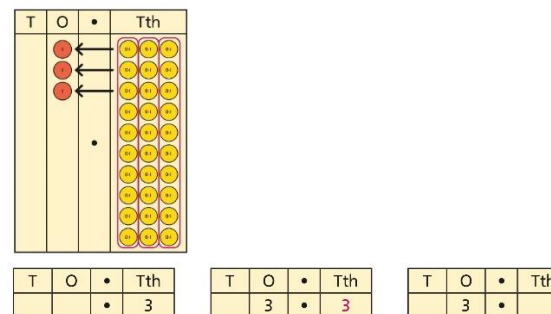
$$0.3 \times 10 = ?$$

0.3 is 3 tenths.

10 x 3 tenths are 30 tenths.

30 tenths are equivalent to 3 ones.

Understand how the exchange affects decimal numbers on a place value grid.



$$0.3 \times 10 = 3$$

Use knowledge of multiplying by 10, 100 and 1,000 to multiply by multiples of 10, 100 and 1,000.

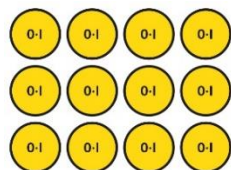
$$\begin{aligned} 8 \times 100 &= 800 \\ 8 \times 300 &= 800 \times 3 \\ &= 2,400 \end{aligned}$$

$$\begin{aligned} 2.5 \times 10 &= 25 \\ 2.5 \times 20 &= 2.5 \times 10 \times 2 \\ &= 50 \end{aligned}$$

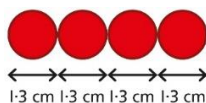
Maths Mastery Policy

Multiplying decimals

Explore decimal multiplications using place value equipment and in the context of measures.



3 groups of 4 tenths is 12 tenths.
4 groups of 3 tenths is 12 tenths.



$4 \times 1 \text{ cm} = 4 \text{ cm}$
 $4 \times 0.3 \text{ cm} = 1.2 \text{ cm}$
 $4 \times 1.3 = 4 + 1.2 = 5.2 \text{ cm}$

Represent calculations on a place value grid.

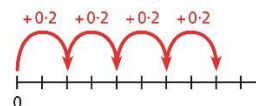
$$3 \times 3 = 9$$

$$3 \times 0.3 = 0.9$$

T	O	•	Tth

Understand the link between multiplying decimals and repeated addition.

T	O	•	Tth



Use known facts to multiply decimals.

$$4 \times 3 = 12$$

$$4 \times 0.3 = 1.2$$

$$4 \times 0.03 = 0.12$$

$$20 \times 5 = 100$$

$$20 \times 0.5 = 10$$

$$20 \times 0.05 = 1$$

Find families of facts from a known multiplication.

I know that $18 \times 4 = 72$.

This can help me work out:

$$1.8 \times 4 = ?$$

$$18 \times 0.4 = ?$$

$$180 \times 0.4 = ?$$

$$18 \times 0.04 = ?$$

Use a place value grid to understand the effects of multiplying decimals.

	H	T	O	•	Tth	Hth
2×3			6	•		
0.2×3			0	•	6	
0.02×3				•		