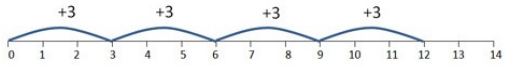
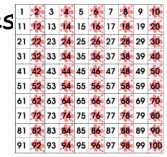
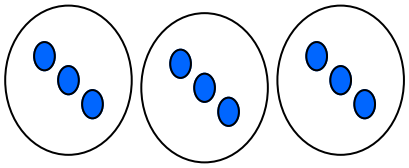
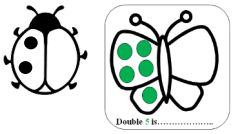
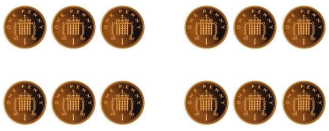
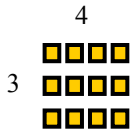
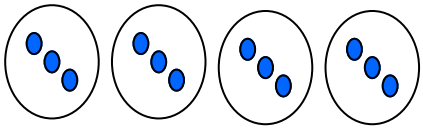
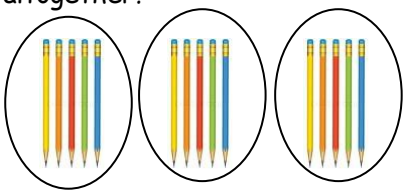
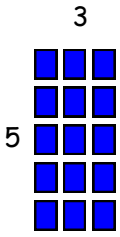
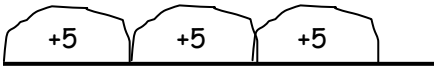
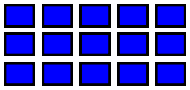
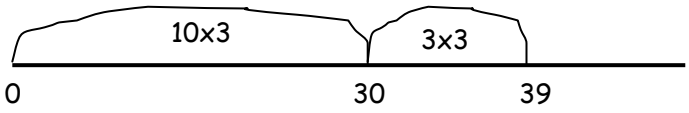
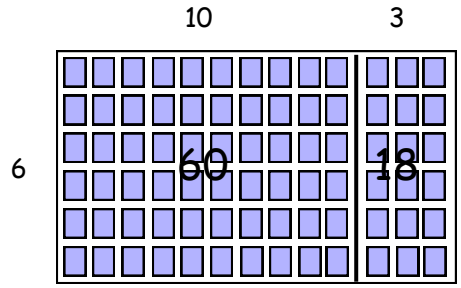
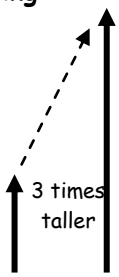
The Richard Heathcote Community Primary School - Multiplication (1)

Year	What will it look like?	Guidance *Guidance in italics taken from the non-statutory guidance in the 'National Curriculum in England' document 2014.*
EYFS	Jumping along number lines in steps of…  Using a 100 square to look at patterns of multiples  Grouping—counting in equal sized groups.  Doubling— using problem solving.  	
Stage 1	Pupils solve one-step problems involving multiplication by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher. E.g. 4 x 3 =    e.g. There were 5 knights who had 3 weapons each. How many weapons did they have altogether? 10 Lords live in a Castle. How many Lords would there be if there was 4 Castles?	*They make connections between arrays, number patterns and counting in 2s, 5s and 10s.*

The Richard Heathcote Community Primary School - Multiplication (2)

Year	What will it look like?	Guidance *Guidance in italics taken from the non-statutory guidance in the 'National Curriculum in England' document 2014.*
Stage 2	Pupils calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and equals (=) signs. 2x5=10 12 = 4x3 Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods and multiplication and division facts, including problems in contexts, e.g. 3 friends have 5 pencils each. How many pencils do they have altogether?    5x3= '5 multiplied by3' or '5 times 3' or '5, three times' 5x3 	*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. The 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 and continuous quantities, to arrays and to repeated addition. They begin to relate these to fractions and measures (for example, 40÷2=20, 20 is half of 40). They use commutativity and inverse relations to develop multiplicative reasoning (for example, 4x5=2- and 20÷5=4)*
Stage 3	Build on their understanding of repeated addition and arrays to multiply two digits by one digit using tables they know, e.g. 13x3  Informal recording of partitioned numbers, 15x5= 10x5 and 5x5 or 10x5 + 5x5	*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 to 2, 4 and 8 multiplication tables.* *Pupils develop efficient mental methods, for example, using commutativity and associativity (for example 4x12x5=4x5x12=20x12=240) and multiplication and division facts (for example, using 3x2=6, 6÷3=2 and 2=6÷3) to derive related facts (for example, 30x2=60, 60÷3=20 and 20=60÷3).*

Year	What will it look like?	Guidance *Guidance in italics taken from the non-statutory guidance in the 'National Curriculum in England' document 2014.*
Stage 3 cont...	Link arrays to introduce grid multiplication to multiply TU by U, e.g. 13x6  60 + 18 = 78 13 x 6 = 78 Use grid method to multiply TU by U, progressing to formal written methods when appropriate. (see stage 4). x | 20 | 3 4 | 80 | 12 = 92 **Scaling**  Relate multiplication to scaling. My string is 12cm long. Cut a piece of string 3 times longer.	*Pupils develop reliable written methods for multiplication and division, starting with calculations of two-digit numbers by ne-digit numbers and progressing to the formal written methods of short multiplication and division.* *Pupils solve simple problems in contexts, deciding which of the four operations to use and why. These include measuring and scaling contexts, (for example, four times as high, eight times as long etc.) and correspondence problems in which 'm ' objects are connected to 'n' objects, (for examples, 3 hats and 4 coats, how many outfits?)*
Stage 4	Pupils multiply two-digit and three-digit numbers by a one-digit number using formal written layout HTUxU using grid method, e.g. 136x5 x | 100 | 30 | 6 5 | | | Progressing to the expanded short multiplication method (least significant digit first). 136 X 5 30 150 + 500 680	*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, (for example 600÷3=200 can be derived from 2x3=6).* *Pupils practise to become fluent in the formal written method of short multiplication.* *Pupils write statements about the equality of expressions (for example, use the distributive law 39x7=30x7 + 9x7 and associative law (2x3)x4=2x(3x4). They combine their knowledge of number facts and rules of arithmetic to solve mental and written calculations for example, 2x6x5 = 10x6=60.*

The Richard Heathcote Community Primary School - Multiplication (4)

<table>
<tr><th>Year</th><th>What will it look like?</th><th>Guidance
Guidance in italics taken from the non-statutory guidance in the 'National Curriculum in England' document 2014.</th></tr>
<tr><td>Stage 4 cont...</td><td>Moving to the formal written method.
136
X 5
680
1 3</td><td></td></tr>
<tr><td>Stage 5</td><td>Multiply numbers up to 4-digits by a one–digit or two-digit number using a formal written method, including long multiplication for two-digit numbers.

Multiply ThHTU x U using the formal written method,
e.g. 1345 x 6

1345
X 6
8070
2 2 3

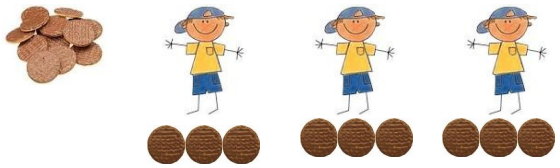
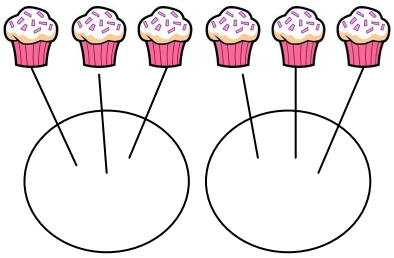
Multiply TUxTU using the grid method, e.g. 38 x 72
<table><tr><th>x</th><th>30</th><th>8</th><th></th></tr><tr><td>70</td><td>2100</td><td>560</td><td>=2660+</td></tr><tr><td>2</td><td>60</td><td>16</td><td>= 76</td></tr><tr><td></td><td></td><td></td><td>2736</td></tr></table>
Progressing to the expanded written form for TU x TU

123
X 25
615 (x5)
2460 (x 20)
3075
1
Extending to the formal written method of long multiplication (see stage 6).</td><td>Pupils practise and extend their use of the formal written methods of short multiplication. They apply all of the multiplication tables and related division facts frequently, commit them to memory and use the confidently to make larger calculations.
They use and understand the terms factor, multiple and prime, square and cube numbers.
Pupils use multiplication and division as inverses to support the introduction of ratio in year 6, for example, by multiplying and dividing by powers of 10 in scale drawings or by multiplying and dividing by powers of a 1000 in converting between units such as kilometres and metres.</td></tr>
<tr><td>Stage 6</td><td>Pupils multiply multi-digit numbers up to 4-digits by a two-digit whole number using the formal written method of long multiplication.

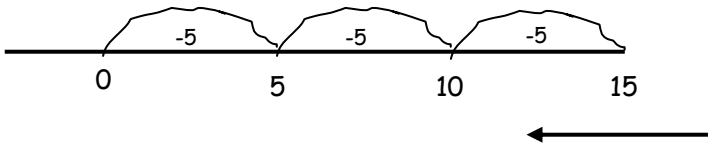
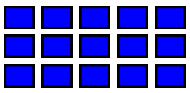
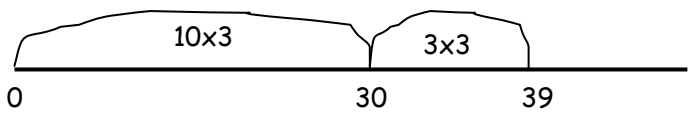
124 x 26 becomes

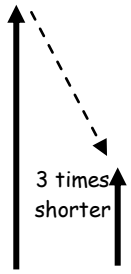
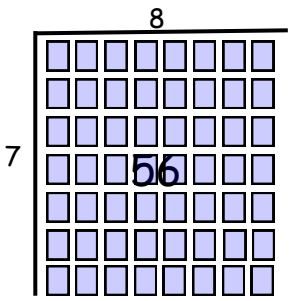
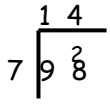
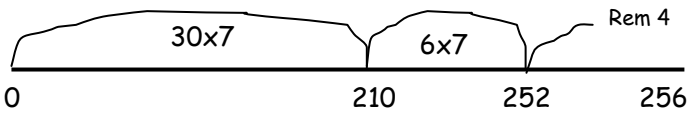
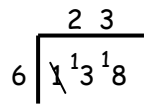
1 2 4
X 2 6
7 4 4
2 4 8 0
3 2 2 4
1 1

Answer: 3224</td><td>Pupils practise addition, subtraction, multiplication and division for larger numbers, using the formal written methods of columnar addition and subtraction, short and long multiplication.
They undertake mental calculations with increasingly large numbers and more complex calculations.
Pupils continue to use all multiplication tables to calculate mathematical statements in order to maintain their fluency.</td></tr>
</table>

Year	What will it look like?	Guidance *Guidance in italics taken from the non-statutory guidance in the 'National Curriculum in England' document 2014.*
EYFS	Pupils use concrete objects and practical situations to explore sharing to answer questions such as: Share the biscuits out so that everyone has the same number.  Cut the sandwich in half, how many pieces are there? 	
Stage 1	Pupils solve one-step problems involving division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher. Pupils use sharing and grouping to solve division problems. <u>Sharing</u> e.g. 6 cakes are shared equally between 2 people. How many cakes does each person get?  <u>Grouping</u> How many pairs of socks can we make from this pile of socks? Count the pairs. 	*They make connections between arrays, number patterns and counting in 2s, 5s and 10s.*

The Richard Heathcote Community Primary School—Division policy (2)

Year	What will it look like?	Guidance *Guidance in italics taken from the non-statutory guidance in the 'National Curriculum in England' document 2014.*
Stage 2	Pupils calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and equals (=) signs. 4x3=12 3x4=12 12÷3=4 12÷4=3 Pupils solve problems involving multiplication and division, using practical materials, arrays, repeated subtraction, mental methods and multiplication and division facts, including problems in contexts. E.g. 15 pencils are put into boxes of 5. How many boxes of pencils will there be?  There will be 3 boxes of 5 pencils. **Arrays**  Also use arrays to model division. 15÷5=3 and 15÷3=5	*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. The 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 and continuous quantities, to arrays and to repeated addition. They begin to relate these to fractions and measures (for example, 40÷2=20, 20 is half of 40). They use commutativity and inverse relations to develop multiplicative reasoning (for example, 4x5=2- and 20÷5=4)*
Stage 3	Pupils write and calculate mathematical statements for division using the multiplication tables that they know, using mental and progressing to formal written methods. Use knowledge of multiplication facts and repeated addition to answer division questions. E.g. How many 3s are there in 39?  Extending to use all tables that pupils know to explore the idea of the remainder.	*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 to 2, 4 and 8 multiplication tables.* *Pupils develop efficient mental methods, for example, using commutativity and associativity (for example 4x12x5=4x5x12=20x12=240) and multiplication and division facts (for example, using 3x2=6, 6÷3=2 and 2=6÷3) to derive related facts (for example, 30x2=60, 60÷3=20 and 20=60÷3).*

Year	What will it look like?	Guidance *Guidance in italics taken from the non-statutory guidance in the 'National Curriculum in England' document 2014.*
Stage 3 cont...	Pupils explore the use of scaling as a model for division, e.g. My ribbon is 24cm long, can you cut a ribbon 3 times shorter?  Pupils are introduced to the formal written method of short division with whole number answers, using the image of the array and place value apparatus initially.  Pupils progress to use the formal written method of short division.  	*Pupils develop reliable written methods for multiplication and division, starting with calculations of two-digit numbers by ne-digit numbers and progressing to the formal written methods of short multiplication and division.* *Pupils solve simple problems in contexts, deciding which of the four operations to use and why. These include measuring and scaling contexts, (for example, four times as high, eight times as long etc.) and correspondence problems in which 'm ' objects are connected to 'n' objects, (for examples, 3 hats and 4 coats, how many outfits?)*
Stage 4	Pupils continue to use the number line to support mental division. Extend to 3-digit divided by a 1-digit number, 257÷7 Estimate first, use a number line to count on, if appropriate.  Pupils continue to become fluent with the formal written method of short division with exact answers. E.g.  	*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, (for example 600÷3=200 can be derived from 2x3=6).* *Pupils practise to become fluent in the formal written method of short multiplication.* *Pupils write statements about the equality of expressions (for example, use the distributive law 39x7=30x7 + 9x7 and associative law (2x3)x4=2x(3x4). They combine their knowledge of number facts and rules of arithmetic to solve mental and written calculations for example, 2x6x5 = 10x6=60.*

Year	What will it look like?	Guidance *Guidance in italics taken from the non-statutory guidance in the 'National Curriculum in England' document 2014.*
Stage 5	Pupils divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret reminders appropriately for the context, e.g. 432 school children go on a camping trip. Each tent sleeps five. How many tents will they need to take? 432÷5 becomes: 8 6 r2 5) 4 3 2 Answer: 86 remainder 2 Answer: they will need to take 87 tents.	*Pupils practise and extend their use of the formal written methods of short multiplication. They apply all of the multiplication tables and related division facts frequently, commit them to memory and use the confidently to make larger calculations.* *They use and understand the terms factor, multiple and prime, square and cube numbers.* *Pupils use multiplication and division as inverses to support the introduction of ratio in year 6, for example, by multiplying and dividing by powers of 10 in scale drawings or by multiplying and dividing by powers of a 1000 in converting between units such as kilometres and metres.*
Stage 6	Pupils divide numbers up to 4 digits by a 2-digit whole number using the formal written method of long division and interpret remainders as whole number reminders, fractions, or by rounding, as appropriate for the context, e.g. Chocolates are packed in trays of 15. If I have 432 chocolates, how many full trays will I have and how many chocolates will be left over? 432 ÷ 15 becomes 2 8 r12 1 5) 4 3 2 − 3 0 0 15x20 1 3 2 1 2 0 15x8 1 2 Answer: There will be 28 trays of chocolates and 12 chocolates left. Pupils progress to expressing their remainders as a fraction. E.g. 432 litres of water are stored in 15 litre drums. How many full drums of water will there be and what fraction of the final drum will be filled? 432 ÷ 15 becomes 2 8 1 5) 4 3 2 − 3 0 0 15x20 1 3 2 1 2 0 15x8 1 2 Answer: There will be 28 full drums and the fifth drum will be 4/5 full. $\frac{12}{15} = \frac{4}{5}$ Answer = $28\frac{4}{5}$	*Pupils practise addition, subtraction, multiplication and division for larger numbers, using the formal written methods of columnar addition and subtraction, short and long multiplication.* *They undertake mental calculations with increasingly large numbers and more complex calculations.* *Pupils continue to use all multiplication tables to calculate mathematical statements in order to maintain their fluency.*

Year	What will it look like?	Guidance *Guidance in italics taken from the non-statutory guidance in the 'National Curriculum in England' document 2014.*
Stage 6 cont...	Progressing to expressing the remainder as a decimal e.g. £432 was raised at the school fair and is to be shared equally between 15 classes. How much will each class receive? 432 ÷ 15 becomes 2 8 . 8 1 5 4 3 2 . 0 3 0 1 3 2 1 2 0 1 2 0 1 2 0 0 Answer: 28.8 Answer: Each class will receive £28.80 Pupils divide numbers up to 4 digits by a 2 digit number using the formal written method of short division where appropriate, interpreting remainders according to the context. E.g. 496 pupils attend a football tournament. When they are put into teams of 11, how many full teams will there be? Will everyone be in a team? 496 ÷ 11 becomes 4 5 r1 1 1 4 9 6 Answer: there will be 45 full teams of 11 players and one pupil who will not have a team.	