# Multiplication Routeway

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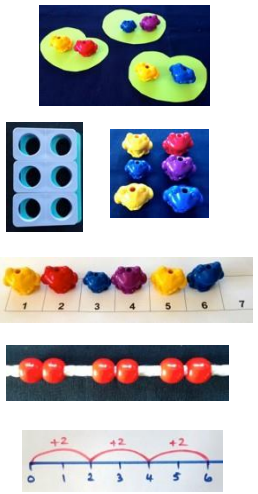
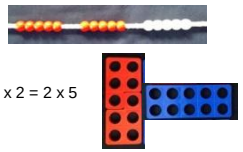
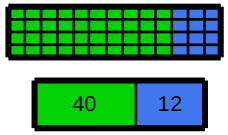
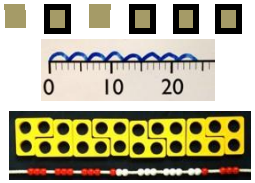
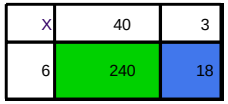
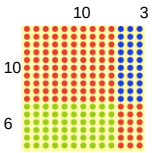
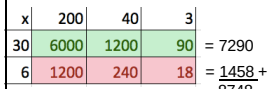
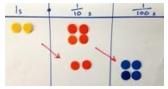
|---|---|---|---|---|---|---|
| **Written Methods** | | Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs | Write and calculate mathematical statements for x using the x tables they know progressing to formal written methods. | | Multiply two-digit and three-digit numbers by a one-digit number using formal written layout (including decimals for money and measures)<br>243<br>x 6<br>2058 | Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication<br>5172<br>x 38<br>41376<br>+ 155160<br>196536<br>1<br><br>2<br>1 5 1<br>5172<br>x 38<br>41376<br>+ 155160<br>196536<br>1<br><br>5172<br>x 38<br>41376<br>1 5 1<br>+ 155160<br>2<br>196536<br>1 |
| **Developing conceptual understanding** | 2 frogs on each lily pad.<br>  | 5 frogs on each lily pad<br>5 x 3 = 15<br>  <br>5 x 2 = 2 x 5<br>  <br>Build tables on counting stick<br>  <br>Link to repeated addition<br>  | If I know 10 x 8 = 80 then …<br>  <br>So 13 x 4 = 10 x 4 + 3 x 4<br>  <br>Build tables on counting stick<br>  | 43 x 6 by partitioning<br>  <br>  <br>40 x 6 = 240<br>3 x 6 = 18<br>43 x 6 = 258<br>If I know 4 x 6 = 24<br>the 40 x 60 is ten times bigger. 13<br>x 16 by partitioning<br>  <br>100 + 30 + 60 + 18 = 208 | Grid method linked to formal written method<br>  <br>If I know 4 x 6 then 0.4 x 6 is ten times smaller<br>0.4 x 0.6 is ten times smaller again.<br>  |
| **With jottings**<br><br>**… or in your head ….** | 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 | Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot.<br>Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts | Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental methods | 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 | Multiply and divide numbers mentally drawing upon known facts. Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000. Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers establish whether a number up to 100 is prime | Solve Multiplication and multi-step problems in contexts, deciding which operations and methods to use and why.<br><br>Examples:<br><br>There is space in the car park for 17 rows of 32 cars. How many cars can park?<br><br>What is the total mass of 235 screws each weighing 6 grams?<br><br>Find the area of a swimming pool which is 25m long and 7.5m wide. |
| **Just know it!** | Count in multiples of twos, fives and tens | Recall and use x and ÷ facts for the 2, 5 and 10 x tables, including recognising odd and even numbers. | Recall and use x and ÷ facts for the 3, 4 and 8 times tables. | Recall x and ÷ facts for x tables up to 12 x 12. | Recall prime numbers up to 19 know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers. Recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed | |
| **Foundations** | Count in 2s | 2 x table | Review 2x, 5x and 10x | 4x, 8x tables 10 times bigger | 4x, 8x tables 100, 1000 times | Multiplication facts up to 12 x 12 |
| | Count in 10s | 10 x table | 4x table | 3x, 6x and 12x tables | 3x, 6x and 12x tables 10, 100, 1000 | Partition to multiply mentally |
| | Doubles up to 10 | Doubles up to 20 and multiples of 5 | Double two digit numbers | Double larger numbers and decimals | Double larger numbers and decimals | Double larger numbers and decimals |
| | Count in 5s | 5 x table | 8 x table | 3x, 9x tables | 3x, 9x tables | Multiplication facts up to 12 x 12 |
| | Double multiples of 10 | Count in 3s | 3 x table | 11x, 7 x tables | 11x , 7 x tables Partition to multiply | Partition to multiply mentally |
| | Count in 2s, 5s and 10s | 2 x, 5 x and 10 x tables | 6 x table or review others | 6x, 12 x tables | 6x, 12 x tables | Double larger numbers and decimals |

**Year 1** **PROGRESSION** **Year 6**

# Division Routeway

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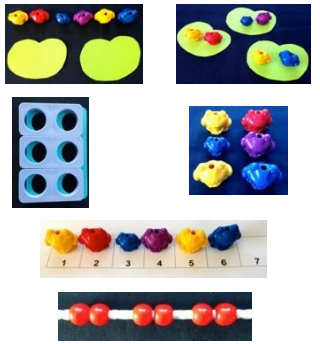
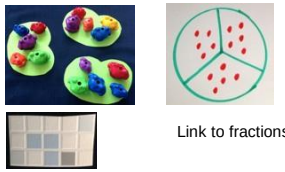
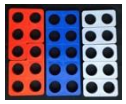
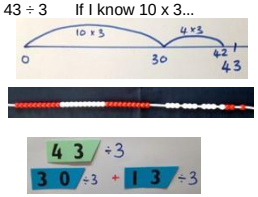
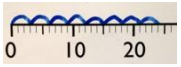
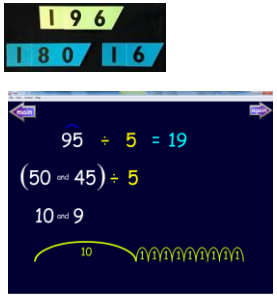
| **Written Methods** | | Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs | Write and calculate mathematical statements for ÷ using the x tables they know progressing to formal written methods. | | **Short Division**<br>2 3 remainder 1 (16 ÷ 7)<br>3 4 remainder 2 (272 ÷ 8)<br>2 4 1 remainder 2 (1446 ÷ 6)<br>1 3 4 5 remainder 5 (94315 ÷ 7)<br>There are 421 children here today. How many teams of 9 can we make? 46 r 7 = 46 teams<br>206 tickets were sold for a concert; there are 7 seats per row, how many rows are needed? 29 r 3 = 30 rows | **Long Division**<br>45 remainder 5 (495 ÷ 11)<br>24 remainder 4 (504 ÷ 21)<br>361 remainder 12 (4332 ÷ 12)<br>132 (3432 ÷ 26)<br>- 2600 (×100)<br>832<br>- 780 (×30)<br>52<br>- 52 (×2)<br>0<br>26.4 (396.0 ÷ 15)<br>- 300 (×20)<br>96<br>- 90 (×6)<br>6.0<br>- 6.0 (×0.4)<br>0<br>**Also include:**<br>57.26 remainder 0.36 (3432 ÷ 60)<br>Solve division and multi-step problems in contexts, deciding which operations and methods to use and why.<br>Examples:<br>How many 35p packets of stickers can I buy with £5.00?<br>Coaches have 56 seats for passengers. How many coaches are needed to take 275 people on a trip? |
| **Developing conceptual understanding** | 6 ÷2 = 3 by sharing into 2 groups and by grabbing groups of 2<br>  <br>How many 2s?<br>  | 15 ÷ 3 = 5 in each group (sharing)<br>  <br>Link to fractions<br>15 ÷ 3 = 5 groups of 3 (grouping)<br>  <br>10 ÷2 = 5<br>  <br>Use language of division linked to tables.<br>How many 2s?<br>  | Grouping using partitioning<br>43 ÷ 3 If I know 10 x 3...<br>  <br>Use language of division linked to tables eg. Counting in jumps on a number line.<br>How many 3s?<br>  | Grouping using partitioning<br>196 ÷ 6<br>If I know 3 x 6 … then 30 x 6…<br>  | | |
| **With jottings**<br>**… or in your head ….** | 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 | Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot. Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts | Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental methods | 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 | Multiply and divide numbers mentally drawing upon known facts Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 | |
| **Just know it!** | Count in multiples of twos, fives and tens | Recall and use x and ÷ facts for the 2, 5 and 10 x tables, including recognising odd and even numbers. | Recall and use x and ÷ facts for the 3, 4 and 8 times tables. | Recall x and ÷ facts for x tables up to 12 x 12. | Recall prime numbers up to 19<br>know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers | |
| **Foundations** | Count back in 2s | Division facts (2 x table) | Review division facts (2x, 5x, 10x table) | Division facts (4x, 8x tables)<br>10 times smaller | Division facts (4x, 8x tables)<br>100, 1000 times smaller | Division facts (up to 12 x 12) |
| | Count back in 10s | Division facts (10 x table) | Division facts (4 x table) | Division facts (3x, 6 x, 12x tables) | Division facts (3x, 6 x, 12x tables)<br>Partition to divide mentally | Partition to divide mentally |
| | Halves up to 10 | Halves up to 20 | Halve two digit numbers | Halve larger numbers and decimals | Halve larger numbers and decimals | Halve larger numbers and decimals |
| | Count back in 5s | Division facts (5 x table) | Division facts (8 x table) | Division facts (3x, 9x tables) | Division facts (3x, 9x tables)<br>100, 1000 times smaller | Division facts (up to 12 x 12) |
| | Halve multiples of 10 | Count back in 3s | Division facts (3 x table) | Division facts (11x, 7x tables) | Review division facts (11x, 7x tables)<br>Partition decimals to divide mentally | Partition to divide mentally |
| | How many 2s? 5s? 10s? | Review division facts (2x, 5x, 10x table) | Division facts (6 x table) or review others | Division facts (6x, 12x tables) | Review division facts (6x, 12x tables)<br>Halve larger numbers and decimals | Halve larger numbers and decimals |

**Year 1** **PROGRESSION** **Year 6**