

Wilbury Calculations Policy



May 2018

Aims of the Calculation Policy

The following calculation policy has been devised to meet requirements of the National Curriculum 2014 for the teaching and learning of mathematics, and is also designed to give pupils a consistent and smooth progression of learning in calculations across the school.

To ensure understanding, each calculation is taught systematically through;





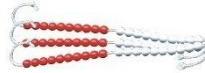

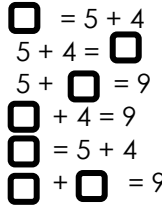













- concrete materials
- pictorial representations
- written methods.

The policy is set out as an indication of end of year expectations for each year group. If a child has a clear understanding of the required calculation, they then need to show they can use that skill through deeper learning/thinking through word problems/ reasoning explanations or puzzle type questions. It is important that any type of calculation is given a real life context or problem solving approach to help build children's understanding of the purpose of calculation, and to help them recognise when to use certain operations and methods when faced with problems.

Addition

To add successfully, children need to be able to:

- Recall all addition pairs to 9 + 9 and know number bonds to and within 10/20/100
 - Add mentally a series of one-digit numbers, such as 5 + 8 + 4
 - Add multiples of 10 (such as 60 + 70) and 100 (such as 600 + 700) using the related addition fact, e.g. 6 + 7, and their knowledge of place value
 - Partition two-digit and three-digit numbers into multiples of 100, 10 and 1 in different
- Children should also be learning mental methods of calculation alongside the more formal written methods.


By the end of Foundation Stage	By the end of Year 1	By the end of Year 2								
<ul style="list-style-type: none">Understand concept and vocabulary of plus, add, more total, sum and altogether. The vocabulary should be taught through practical activities in meaningful contexts up to 10.Songs – 1,2,3,4,5 Once I caught a fish alive,Count on, altogether, one more etc.Matching numbers to objectsCounting on fingers in a consistent wayCounting forwards in 1's, 2's and 10's, up to 100, 20, 100 respectively. <div></div> <ul style="list-style-type: none">Use objects and marks to signify 1 more/2 more. e.g. There are 3 cars in the garage. 1 more came along. <div></div> <ul style="list-style-type: none">Terry has 3 apples and Tony has 2 apples. How many apples altogether? <div></div>	<p>Through practical activities in meaningful contexts and informal written methods</p> <ul style="list-style-type: none">Develop partitioning/bonds to 20 and within 20 (separate a group of objects into 2 groups) <p>e.g. 8 is 5 and 3. Reinforce with Numicon.</p> <div></div> <ul style="list-style-type: none">Use of number sentences and mathematical language - count on / altogether / one more/ two more. <div></div> <ul style="list-style-type: none">Use of number lines and 100 square within 10 (Ext. to 50). <div></div> <ul style="list-style-type: none">Relationships/related facts including symbols + and = in various positions in number sentence. <div></div>	<ul style="list-style-type: none">Through practical activities, meaningful contexts and informal written methodsUsing Numicon, fluent recall of bonds to 20 and within 20 <div></div> <ul style="list-style-type: none">Derive fact families up to 100 13 + 7 = 20 7 + 13 = 20 (and link to subtraction) 20 = 7 + 13 20 - 7 = 13 20 - 13 = 7 <ul style="list-style-type: none">Use Dienes to represent tens and ones to add digits. <div><table><tr><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td></tr></table> + <table><tr><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td></tr></table></div>	Tens	Ones			Tens	Ones		
Tens	Ones									
										
Tens	Ones									
										

- Use Numicon or other concrete materials.



$$3 + 1 =$$

- Begin to work on number bonds to 10.
- Use concrete objects to help recognise the value of coins and simple addition.



$$2p + 1p =$$

Outdoor Curriculum

- Role-playing number songs.
- Matching numbers to objects.
- Number in buckets, adding correct number of blocks/bean bags.
- Number in hoops, throwing the correct number of beanbags into hoops.
- Counting forward in 1s through, skipping, jumping on numbers, shooting hoops etc.
- Using chalk to draw numbers or objects.
- Bowling, working out how many pins have been knocked over.



- Partitioning using Numicon e.g. $14 = 10 + 4$



- Money and addition up to 50p.



- Count in 2's, 5's and 10's.
- Adding multiples of 10.

$$\begin{aligned} \text{e.g. } & 5 + 10 \\ & 5 + 20 \\ & 3 + 30 \end{aligned}$$

- Adding three numbers.

$$\begin{aligned} \text{e.g. } & 2 + 8 + 4 = 14 \\ & 1 + \square + 5 = 9 \end{aligned}$$

- Extend to questions such as;

$$\text{e.g. } 14 + 5 = 10 + \square$$

National Curriculum requirements:

Add 1 digit and 2 digit numbers to 20, including 0.

- Use lines and dots to represent tens and ones.

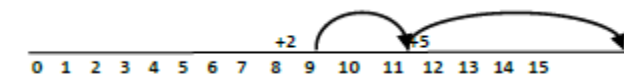
T O + T O

$$3 \quad 2 + 2 \quad 1 = 53$$

$$||| \quad \cdot + || \quad \cdot = ||||| \dots$$

- Constructing own lines- partitioning the smallest number

$$8 + 7 = 15$$



- Addition of money up to £1.00 – using coins

- Count on in 2's, 3, 5's and 10's from different numbers e.g. 3, 9, 16, within 100.

- Column addition – no carrying

National Curriculum requirements:

(using concrete objects, pictorial representations and mentally)

Add 2 digit numbers and ones.

Add 2 digit number and tens.

Add two 2 digit numbers.

Add three 1 digit numbers.

Ext. Add three 2 digit numbers.




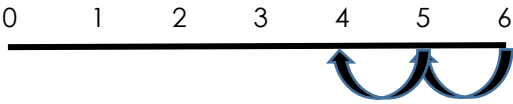
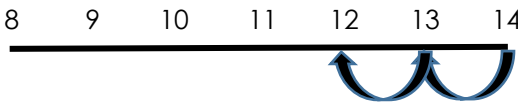
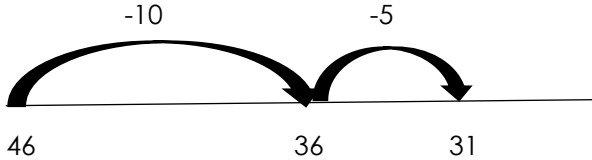
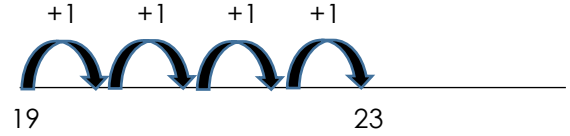
By the end of Year 3	By the end of Year 4	By the end of Year 5	By the end of Year 6
<ul style="list-style-type: none">Through practical activities, meaningful contexts and informal written methodsUsing Numicon, fluent recall of bonds to 100 and within 100 <div><div><div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div></div></div><div><div></div></div><div>= 100</div></div> <ul style="list-style-type: none">Use Dienes to represent hundreds, tens and ones to add digits up to 1000. <div><div><div><div>H</div><div>T</div><div>O</div></div><div><div></div><div></div><div></div></div></div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> 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<ul style="list-style-type: none"> Column addition with carrying up to 1000 (including missing digits). <div> <div>Th H T O</div> <div> <div>1</div> <div>3 7 1</div> <div>+ 4 8 5</div> <div>8 5 6</div> </div> </div> <p>National Curriculum requirements: Add numbers with up to 3 digits, using the formal written method of column addition. Solve problems involving addition.</p>	<p>Solve problems involving addition.</p>	<p>Add whole numbers with more than 4 digits, using the formal written method of column addition. Solve problems involving addition.</p>	<p>National Curriculum requirements: Add whole numbers with more than 4 digits, using the formal written method of column addition. Solve problems involving addition.</p>
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Subtraction

To subtract successfully, children need to be able to:

- Recall subtraction facts to 20 and within 20.
- Subtract multiples of 10 (e.g. $160 - 70$) using the related subtraction fact $16 - 7$ and their knowledge of place value.
- Partition two-digit and three-digit numbers into multiples of hundreds, tens and ones in different ways (e.g. partition 74 into $70 + 4$ or $60 + 14$).
- Children should also be learning mental methods of calculation alongside the more formal written methods.

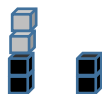
By the end of Foundation Stage	By the end of Year 1	By the end of Year 2
<ul style="list-style-type: none"> Understand the concepts and vocabulary of -, difference, subtraction, less, minus and take away through practical activities in meaningful contexts within 5 and 10. Sing songs such as, '5 little ducks went out on day, 10 in a bed, 10 fat sausages...'  <ul style="list-style-type: none"> Use pegs, take one/two away.  Counting on from a smaller number. Counting back through practical activities in meaningful contexts. E.g. We made 6 cakes. We ate 2 of them. How many cakes are left?  <ul style="list-style-type: none"> Link to number line $6 - 2 =$ 	<ul style="list-style-type: none"> Through practical activities, meaningful contexts and informal written methods. Find the difference within 20 e.g. the difference between 7 and 11 using towers/ Numicon or Cuisenaire rods. Find the difference by counting up (only when the difference is small). <p>e.g. $14 - 12 = 2$</p>  <ul style="list-style-type: none"> Subtract multiples of 10, record using - and =. e.g. $50 - 20 = 30$ Relationships/related facts. <div style="display: flex; flex-direction: column; align-items: center;"> <div><input type="checkbox"/> = 5 - 2</div> <div>$5 - 2 =$<input type="checkbox"/></div> <div>$5 -$<input type="checkbox"/>$= 3$</div> <div><input type="checkbox"/> - 2 = 3</div> <div><input type="checkbox"/> = 5 - 2</div> <div><input type="checkbox"/> - <input type="checkbox"/> = 2</div> </div> <ul style="list-style-type: none"> Continued use of Numicon e.g. $12 - 8 =$ 	<ul style="list-style-type: none"> Through practical activities, meaningful contexts and informal written methods Using Numicon and a number line to count back by partitioning the second number. Eg. $46 - 15$ $46 - 10 - 5$  <ul style="list-style-type: none"> Using Numicon and a number line to count on when the number is small. Eg. $23 - 19$  <ul style="list-style-type: none"> Inverse bonds fluently to 20 and within 20 <p>e.g. $20 - 18 = 2$ $20 - 2 = 18$ $16 \text{ minus } 4 = 12$ $16 \text{ subtract } 12 = 4$</p>

- Use Numicon or other concrete materials.



$$6 - 2 = 4$$

- The difference between 2 and 4.



- Begin to use the inverse of number bonds to 10.

Outdoor Curriculum

- Role-play number songs.
- Pegs on a number line, 1 less, 2 less.
- Hoops and beanbags.
- Problem solving.
E.g. There are 5 tricycles, 2 are being used. How many are left?



- Consolidate inverse of number bonds to 20

e.g. $15 - 3 = 12$
 $15 - 12 = 3$

- Consolidate inverse of number bonds within 20

e.g. $6 + 2 = 8$
 $8 - 2 = 6$
 $8 - 6 = 2$

National Curriculum requirements:

Add and subtract one digit and two digit numbers to 20 including 0.
 Represent and use number bonds and related subtraction facts.

- Use Dienes to represent tens and ones to subtract digits.

Tens	Ones		Tens	Ones
		-		

- Use lines and dots to represent tens and ones.

T O - T O

$$3 \quad 2 \quad - \quad 2 \quad 1 \quad = \quad 11$$

$$||| \quad .. \quad - \quad || \quad . \quad = \quad || \quad .$$

- Derive and use related facts up to 100

e.g. $10 - 7 = 3$ so
 $100 - 70 = 30$

- Column subtraction – no exchange

National Curriculum requirements:



(using concrete objects, pictorial representations and mentally)

Subtract 2 digit numbers and ones.

Subtract 2 digit number and tens.

Subtract two 2 digit numbers.

Subtract three 1 digit numbers.









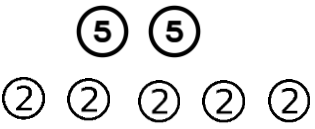
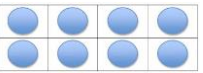
By the end of Year 3	By the end of Year 4	By the end of Year 5	By the end of Year 6																																																	
<ul style="list-style-type: none">Through practical activities, meaningful contexts and informal written methodsInverse bonds fluently to 100 and within 100 <p>e.g. $100 - 40 = 60$ $100 - 60 = 40$ 100 minus 40 = 60 100 subtract 60 = 40</p> <ul style="list-style-type: none">Use Dienes to represent hundreds, tens and ones to add digits up to 1000. <div><table><tr><td>H</td><td>T</td><td>O</td></tr><tr><td></td><td></td><td></td></tr></table><div>—</div><table><tr><td>H</td><td>T</td><td>O</td></tr><tr><td></td><td></td><td></td></tr></table></div> <p>$324 + 213 = 111$</p> <p>$324 - 213 = \dots$</p> <ul style="list-style-type: none">Derive and use related facts up to 1000. <p>e.g. $10 - 7 = 3$ so $100 - 70 = 30$ so $1000 - 700 = 300$</p>	H	T	O				H	T	O				<ol style="list-style-type: none">Adjustment to Hundreds and TensAdjustment to Hundreds and Tens to OnesAdjustments to NoughtsCheck using the inverseExtension, subtract numbers up to 4 digits. <div><table><tr><td>HTO</td><td>HTO</td></tr><tr><td>34137</td><td>3412312</td></tr><tr><td>− 182</td><td>− 187</td></tr><tr><td>255</td><td>245</td></tr></table> <table><tr><td>HTO</td><td>HTO</td></tr><tr><td>46710</td><td>5691014</td></tr><tr><td>− 142</td><td>− 347</td></tr><tr><td>328</td><td>257</td></tr></table> <table><tr><td>£4.35</td><td>£5.345</td><td>£23.59</td></tr><tr><td>− £1.23</td><td>− £2.29</td><td>− £1.73</td></tr><tr><td>£3.12</td><td>£3.16</td><td>£1.86</td></tr></table></div> <ul style="list-style-type: none">Subtract common denominator fractions. <p>$5/6 - 2/6 = 3/6$ $6/7 - 3/7 = 3/7$</p> <p>National Curriculum requirements: Subtract numbers up to 4 digits using the formal written method of column subtraction. Solve problems involving subtraction.</p>	HTO	HTO	3 4137	3 412312	− 182	− 187	255	245	HTO	HTO	46710	5691014	− 142	− 347	328	257	£4.35	£5.345	£23.59	− £1.23	− £2.29	− £1.73	£3.12	£3.16	£1.86	<ul style="list-style-type: none">Subtraction involving O, T, H, Th and beyond including noughts and decimals (without place value headings). <div><table><tr><td>3156173</td><td>1107</td></tr><tr><td>− 892</td><td>− 56</td></tr><tr><td>3781</td><td>151</td></tr></table> <table><tr><td>45.12315</td><td>34.1010</td></tr><tr><td>− £2.87</td><td>− £1.35</td></tr><tr><td>£2.48</td><td>£2.65</td></tr></table></div> <ul style="list-style-type: none">Solve real life word problems involving money or measures e.g. <p>I was given £3000. I spent £1 356 on theatre tickets. How much money do I have left?</p> <div></div> <ul style="list-style-type: none">Subtract different denominator fractions by finding the equivalent fraction. <p>$4/5 - 2/10 =$ $8/10 - 2/10 = 6/10$</p> <p>$2/3 - 4/9 =$ $6/9 - 4/9 = 2/9$</p> <p>National Curriculum requirements:</p>	3 15 6 173	1 107	− 892	− 56	3781	151	4 5.12315	3 4.1010	− £2.87	− £1.35	£2.48	£2.65	<ul style="list-style-type: none">Subtract mixed number fractions with different denominators. <p>$3/4 - 1/6 =$ $9/12 - 2/12 = 7/12$</p> <p>$3/5 - 4/7 =$ $21/35 - 20/35 = 1/35$</p> <p>$3\frac{1}{2} - 1\frac{1}{4} =$ $7/2 - 5/4 =$ $14/4 - 5/4 = 9/4$ $= 2\frac{1}{4}$</p> <ul style="list-style-type: none">Reinforce and secure all of the above with increasing emphasis on using and applying in preparation for secondary transfer. <p>National Curriculum requirements: Subtract numbers with more than 4 digits. Solve problems involving subtraction.</p>
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<ul style="list-style-type: none"> Column subtraction with carrying up to 1000 (including missing digits). <div style="text-align: center;"> <p>Th H T O</p> <p> ⁶ ¹</p> <p> 371</p> <p>- 125</p> <hr style="width: 10%; margin: 0 auto;"/> <p> 246</p> </div> <p>National Curriculum requirements: Subtract numbers with up to 3 digits using the formal written method of columnar subtraction. Solve problems involving subtraction.</p>		Subtract numbers with more than 4 digits. Solve problems involving subtraction.	
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Multiplication

To multiply successfully, children need to be able to:

- Recall multiplication facts to 12 x 12.
 - Partition numbers into multiples of hundreds, tens and ones.
 - Work out products such as 70 x 5, 70 x 50, 700 x 5 or 700 x 50 using related fact 7 x 5 and their knowledge of place value.
 - Add two or more single-digit numbers mentally.
 - Add multiples of 10 (e.g. 60 + 70) or of 100 (e.g. 600 + 700) using related addition fact 6 + 7 and their knowledge of place value.
 - Add combinations of whole numbers using the column method.
- Children should also be learning mental methods of calculation alongside the more formal written methods.

By the end of Foundation Stage	By the end of Year 1	By the end of Year 2
<ul style="list-style-type: none"> Understand concept and vocabulary of multiplication (double, lots of) through practical activities in meaningful contexts. Counting in 2's and 10's (extend to 5's). Double up to 5 + 5. Double objects practically. <div>  </div> <p><u>Outdoor Curriculum</u></p> <ul style="list-style-type: none"> Practical problems, e.g. There are 2 children and they each need 4 balls. How many balls do they need altogether? <div>  </div> <p>How many wheels do 2 tricycles have?</p> <div>  </div> <p>Board games</p>	<ul style="list-style-type: none"> Through practical activities, meaningful contexts and informal written methods. Doubles up to 10 + 10 using Numicon and other concrete materials. e.g. <div>  </div> <ul style="list-style-type: none"> Count up in 2's, 5's and 10's to 100. Count back in 2's, 5's and 10's from any given number within 100. Continue to use number lines to count up and back. e.g. <div>  </div> <ul style="list-style-type: none"> Solve one-step problems. E.g. How many marbles altogether? <div>  </div>	<ul style="list-style-type: none"> Through practical activities, meaningful contexts and informal written methods. Using Numicon, double numbers up to 20 + 20 (by partitioning and recombining) E.g. 17 + 17 <div>  </div> <div>  </div> <ul style="list-style-type: none"> Understand multiplication as repeated addition/groups of/lots of. E.g. 2 x 5 <div>  </div> <ul style="list-style-type: none"> Reading arrays E.g. 4 x 2 <div>  </div>

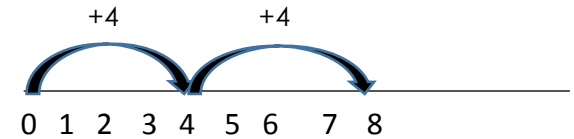
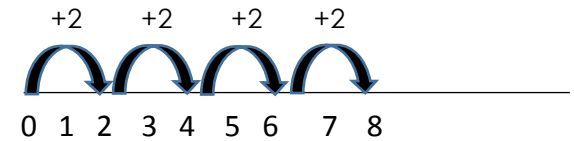
- Count multiples of coins of 2p, 5p and 10p.



National Curriculum requirements:

Solve one-step problems involving multiplication, by calculating the answer using concrete materials, pictorial representations and arrays with the support of the teacher.

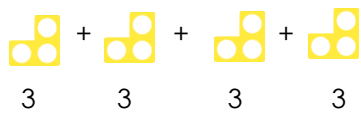

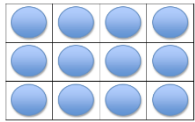
- Using a number line to show repeated addition. Eg. 4×2



- Know the times tables and division facts for 2, 5 and 10 (Extension 3x tables).
- Understand that multiplication is commutative.

National Curriculum requirements:








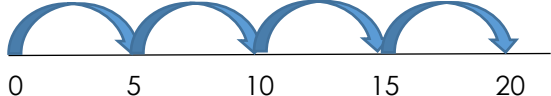
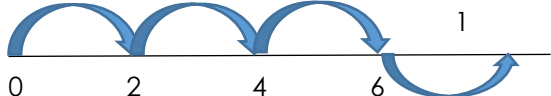
Solve problems involving multiplication using materials, arrays, mental methods and multiplication facts.

By the end of Year 3	By the end of Year 4	By the end of Year 5	By the end of Year 6
<ul style="list-style-type: none"> Through practical activities, meaningful contexts and informal written methods Using Numicon, arrays and circles, demonstrate repeated addition for multiplication. <p>E.g. $3 \times 4 = 3 + 3 + 3 + 3$</p>  <p>3 3 3 3</p> <ul style="list-style-type: none"> Use commutative law.   <ul style="list-style-type: none"> Know the times tables and division facts for 2, 3, 4 5, 8 and 10. Understand short multiplication through partitioning up to 2 digits by 1 digit. <p>e.g. $35 \times 4 =$ $30 \times 4 = 120$ $5 \times 4 = 20$</p> <p>120 + 20 = 140</p> <p>National Curriculum requirements: Multiply 2 digits by 1 digit, using mental and progressing to formal written methods. Solve problems involving multiplication.</p>	<ul style="list-style-type: none"> Know times tables and corresponding division facts up to 12×12 Use short multiplication including carrying, noughts and missing digits. Extension – Long Multiplication $\begin{array}{r} 38 \\ \times 7 \\ \hline 266 \end{array}$ $\begin{array}{r} 202 \\ \times 4 \\ \hline 808 \end{array}$ $\begin{array}{r} 5 \square \\ \times 4 \\ \hline 2 \square 2 \end{array}$ <p>National Curriculum requirements: Multiply 2 digits by 1 digit using formal written layout. Multiply 3 digits by 1 digit using formal written layout. Solve problems involving multiplication.</p>	<ul style="list-style-type: none"> Use long multiplication to Th and beyond. $\begin{array}{r} 4 \ 2 \ 5 \\ 1638 \\ \times 7 \\ \hline 11466 \end{array}$ $\begin{array}{r} 202 \\ \times 24 \\ \hline 808 \\ 4040 \\ \hline 4848 \end{array}$ $\begin{array}{r} 12 \ 24 \ 24 \\ 3468 \\ \times 36 \\ \hline 20808 \\ 104040 \\ \hline 124848 \end{array}$ $\begin{array}{r} 8 \square 6 \\ \times 31 \\ \hline 816 \\ 244 \square 0 \\ \hline 25296 \end{array}$ <ul style="list-style-type: none"> multiply proper fractions and mixed numbers by whole numbers. $\frac{3}{4} \times 4 =$ $\frac{3}{4} \times \frac{4}{1} = \frac{12}{4}$ $\frac{12}{4} = 3$ $1\frac{1}{2} \times 3 =$ $\frac{3}{2} \times \frac{3}{1} = \frac{9}{2}$ $\frac{9}{2} = 4\frac{1}{2}$ <p>National Curriculum requirements: Multiply numbers up to 4 digits by a 1 digit number using the formal written method of short multiplication. Multiply numbers up to 4 digits by a 2 digit number using the formal written method of long multiplication. Multiple whole numbers and those involving decimals by 10, 100, 1000. Solve problems involving multiplication.</p>	<ul style="list-style-type: none"> Reinforce and secure all of the above with increasing emphasis on using and applying in preparation for secondary transfer. Multiply decimals using columns. $\begin{array}{r} 1 \ 3 \\ 2.38 \\ \times 4 \\ \hline 9.52 \end{array}$ $\begin{array}{r} 2 \\ 2.04 \\ \times 1.6 \\ \hline 12.24 \\ 20.40 \\ \hline 32.64 \end{array}$ <ul style="list-style-type: none"> multiply proper fractions and mixed numbers by proper fractions or mixed numbers. $\frac{3}{4} \times \frac{1}{8} =$ $\frac{6}{8} \times \frac{1}{8} = \frac{6}{64}$ $\frac{6}{64} = \frac{3}{32}$ $1\frac{1}{2} \times 2\frac{3}{4} =$ $\frac{3}{2} \times 1\frac{1}{4} = \frac{33}{8}$ $\frac{33}{8} = 4\frac{1}{8}$ <p>National Curriculum requirements: Multiply up to 4 digits by 2 digits using the formal written method of long multiplication. Multiply numbers by 10, 100, 1000 giving answers up to 3 decimal places. Solve problems involving multiplication.</p>

Division

To be able to divide successfully, children need to be able to:

- Recall division facts up to 12.
 - Understand and use the vocabulary of division, e.g. $18 \div 3 = 6$, 18 is the dividend, 3 is the divisor and 6 is the quotient.
 - Partition two-digit and three0digit numbers into multiples of 100, 10 and 1 in different ways.
 - Recall multiplication facts of one-digit numbers and divide multiples of 10 or 100 by a single digit number using their knowledge of division facts and place value.
 - Know how to find a remainder working mentally, e.g. $48 \div 5$ remainder being 3
 - Understand and use division and multiplication as inverse operations.
- Children should also be learning mental methods of calculation alongside the more formal written methods.

By the end of Foundation Stage	By the end of Year 1	By the end of Year 2
<ul style="list-style-type: none">• Understand concept and vocabulary of division (sharing, shares, equal groups, 1 whole/half) through practical activities in meaningful context.• Sharing 6 cakes between 2 people.  <ul style="list-style-type: none">• Sharing a bag of sweets between 2 children – one for you, one for me.• Grouping objects equally.  <p>How many pairs of socks are there in the laundrette?</p>  <p>10 grouped into 2s. How many groups?</p>	<ul style="list-style-type: none">• Through practical activities, meaningful contexts and informal written methods.• Division as sharing/ share equally. e.g. Share a bag of 15 sweets equally between 5 children using one for me , one for you.  <ul style="list-style-type: none">• Introduce number sentences using the \div sign.• Division as grouping, 2's, 5's and 10's. e.g. A bag of marbles has 12 marbles in it. How many children can have 2 marbles each?  <p>15 children get into teams of 5 to play a game. How many teams are there?</p> 	<ul style="list-style-type: none">• Through practical activities, meaningful contexts and informal written methods• Know by heart, half of all numbers up to 20.• Halving multiples of 10 up to 100.• Recognise the relationship between \times and \div• Use Numicon and hands to help with groups of E.g. $15 \div 5$ <p>How many 5s have been counted?</p>  <ul style="list-style-type: none">• Use number lines linking it to how many 5s in 20?. <p>E.g. $20 \div 5$</p>  <ul style="list-style-type: none">• With remainders E.g. $7 \div 2 = 3 \text{ r } 1$ 

- Introduce halving even numbers up to 10 using multilink and counters, e.g. half of 4

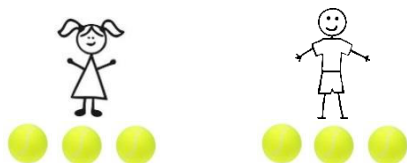


- Halving a whole object.



Outdoor Curriculum

- Practical problems, e.g. There are 2 children and 6 balls. Share them equally, how many does each child get?



- Consolidate halving even numbers up to 10 and link to inverse of multiplication (extension to 20).
e.g.



Understand that 8 shared in 2 groups = 4
Half of 8 is 4
 $2 \times 4 = 8$

- Use of Numicon lines to find how many 2's, 5's and 10's in 20.



0

10

National Curriculum requirements:

Solve one step problems involving division, by calculating the answer by using concrete objects, pictorial representations and arrays with the support of the teacher.



- Use Cuisenaire rods and number track



- Know related division facts for 2, 5 and 10 x tables. Record using \div and $=$ signs. (3x tables for extension)

National Curriculum requirements:

Solve problems involving division using materials, mental methods and division facts.

By the end of Year 3	By the end of Year 4	By the end of Year 5	By the end of Year 6
<ul style="list-style-type: none"> Through practical activities, meaningful contexts and informal written methods. Recognise the relationship between \times and \div Use Numicon and hands to help with groups of. e.g. $32 \div 8 = 4$  <p>How many 8s have been counted?</p> <ul style="list-style-type: none"> Understand division as groups of. e.g. $12 \div 4 = 3$  <ul style="list-style-type: none"> Introduce the bus stop method for 2 digits by 1 digit. $\begin{array}{r} 12 \\ 3 \overline{) 36} \end{array}$ <p>National Curriculum requirements: Division questions based on multiplication tables they know.</p>	<ul style="list-style-type: none"> Know times tables and corresponding division facts up to 12×12 Use short division including carrying, noughts and missing digits. Extension – Remainders and HTO \div TO. $\begin{array}{r} 15 \\ 3 \overline{) 45} \end{array} \quad \begin{array}{r} 204 \\ 4 \overline{) 816} \end{array}$ $\begin{array}{r} 122 \\ 5 \overline{) 6 \square 0} \end{array} \quad \begin{array}{r} 141r1 \\ 3 \overline{) 424} \end{array}$ <p>Extension</p> $\begin{array}{r} 41 \\ 12 \overline{) 492} \end{array}$ <p>National Curriculum requirements: Divide 2 digits by 1 digit and 3 digits by 1 digit becoming fluent with formal written method of short division with</p>	<ul style="list-style-type: none"> Division by 2 digit numbers using short division (bus stop method). Division with remainders, leaving the remainder as a whole number or fraction. Division of decimals. $98 \div 7 = \quad \quad \quad 432 \div 5 =$ $\begin{array}{r} 14 \\ 7 \overline{) 98} \end{array} \quad \begin{array}{r} 86r2 \\ 5 \overline{) 432} \end{array}$ <ul style="list-style-type: none"> Missing digits $\begin{array}{r} 77r\square \\ 5 \overline{) 3\square 36} \end{array}$ <p>National Curriculum requirements: Divide 2 digits by 1 digit. Divide 3 digits by 1 digit. Divide 4 digits by 1 digit.</p>	<ul style="list-style-type: none"> Division with remainders, leaving the remainder as a whole number, fraction or decimal. Reinforce and secure all of the above with increasing emphasis on using and applying in preparation for secondary transfer. $3.4 \div 8 =$ $\begin{array}{r} 0.425 \\ 8 \overline{) 3.420} \end{array}$ $56.2 \div 12 =$ $\begin{array}{r} 4.683 \\ 12 \overline{) 56.820} \end{array}$ <ul style="list-style-type: none"> Divide proper fraction and mixed numbers by proper fraction, whole numbers and mixed numbers. $\begin{aligned} \frac{1}{2} \div \frac{2}{5} &= \\ \frac{1}{2} \times \frac{5}{2} &= \frac{5}{4} \\ \frac{5}{4} &= 1 \frac{1}{4} \end{aligned}$ $\begin{aligned} 1 \frac{2}{3} \div \frac{4}{5} &= \\ \frac{5}{3} \div \frac{4}{5} &= \\ \frac{5}{3} \times \frac{5}{4} &= \frac{25}{12} \\ \frac{25}{12} &= 2 \frac{1}{12} \end{aligned}$

<p>Divide 2 digits by 1 digit, progressing to formal written methods. Solve problems involving division.</p>	<p>exact answers and progressing to remainders. Solve problems involving division.</p>	<p>Children interpret the remainders appropriately for the context. e.g. as fractions, decimals or by rounding $98 \div 4 = 98/4 = 24r2 = 24 \frac{1}{2} = 24.5$ rounded to 25 Divide whole numbers and those involving decimals by 10, 100, and 1000. Solve problems involving division.</p>	<p> $1 \frac{2}{3} \div 4 =$ $5/3 \div 4 =$ $5/3 \div 4/1 =$ $5/3 \times \frac{1}{4} = 5/12$ </p> <p>National Curriculum requirements: Divide numbers up to 4 digits by a 2 digit number using the formal written method of short division where appropriate. Divide up to 4 digits by a 2 digits whole number using the formal written method of long division. Solve problems involving division.</p>
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