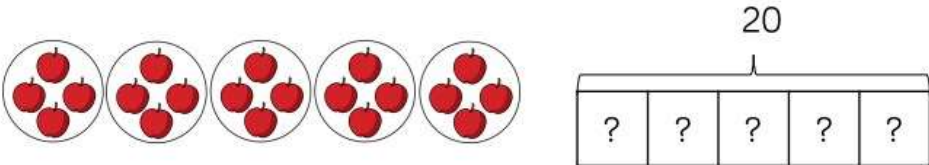
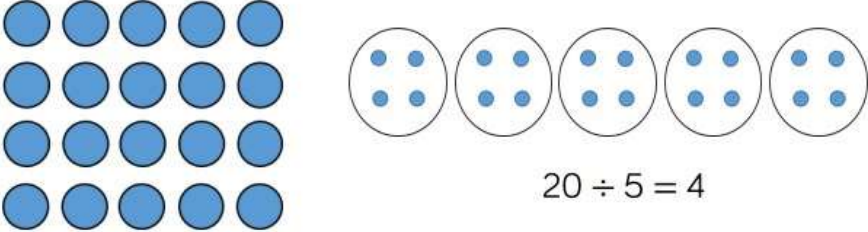


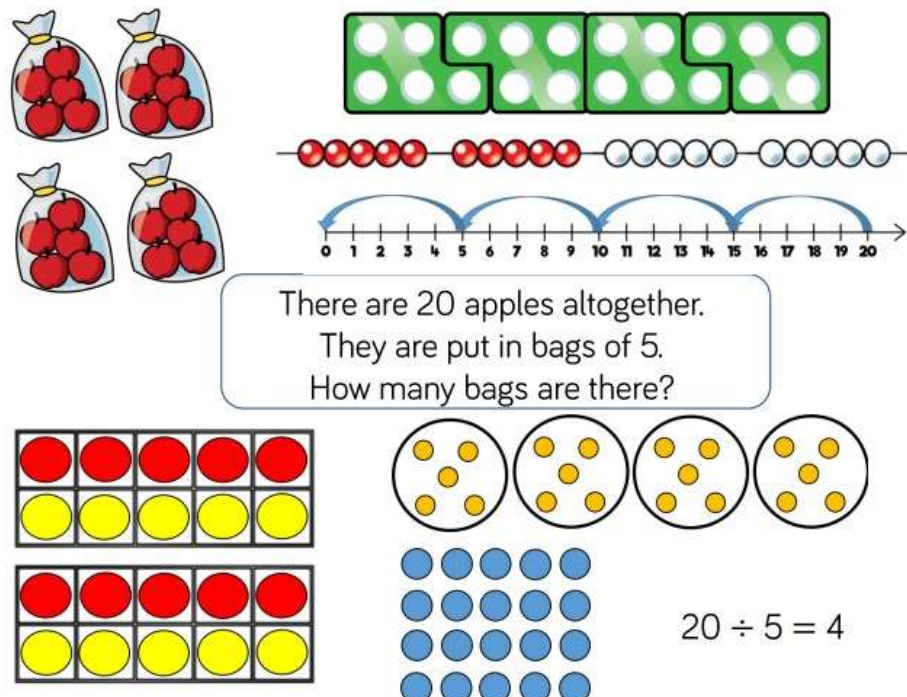


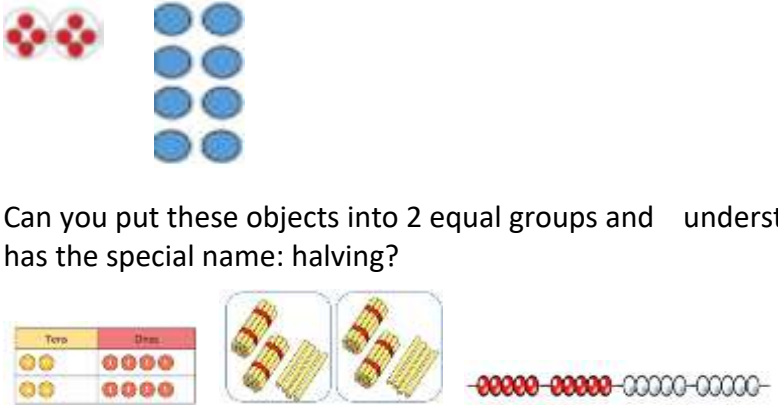
B20 Maths Calculation Policy Part 2

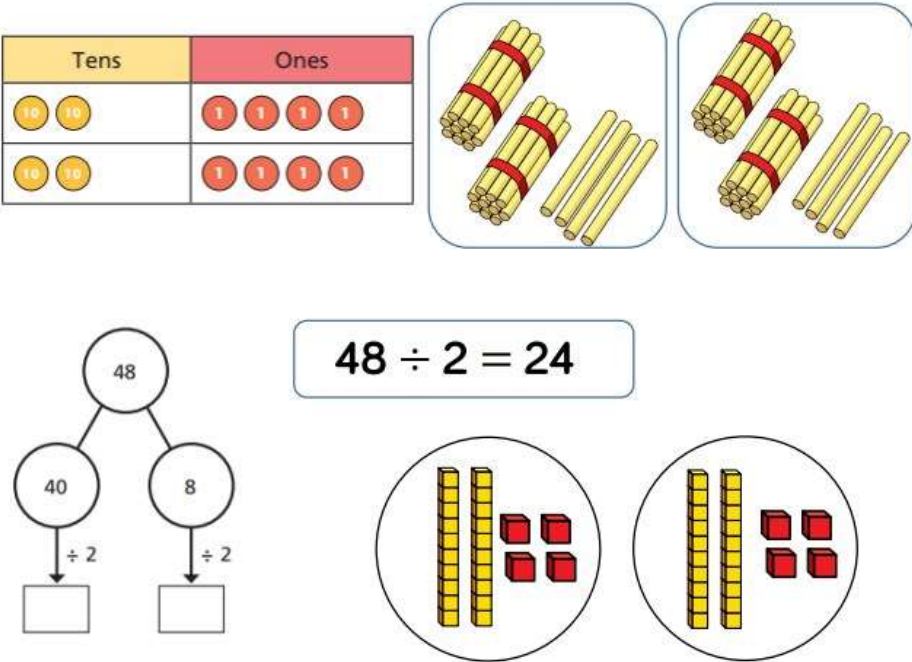
Date of Update	Reason for Update	Next Update
Sept 22	Feedback from NW Maths hub	Sept 24

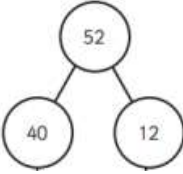
Division

Skill: Solve 1-step problems using division (sharing)	Year: 1/2
 <p data-bbox="392 792 978 936">There are 20 apples altogether. They are shared equally between 5 bags. How many apples are in each bag?</p>  <p data-bbox="772 1122 940 1160">$20 \div 5 = 4$</p>	<p data-bbox="1163 546 1422 689">Children solve problems by sharing amounts into equal groups.</p> <p data-bbox="1163 730 1437 987">In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record division formally.</p> <p data-bbox="1163 1028 1433 1133">In Year 2, children are introduced to the division symbol.</p>

Skill: Solve 1-step problems using division (grouping)	Year: 1/2
 <p>There are 20 apples altogether. They are put in bags of 5. How many bags are there?</p> $20 \div 5 = 4$	<p>Children solve problems by grouping and counting the number of groups. Grouping encourages children to count in multiples and links to repeated subtraction on a number line. They can use concrete representations in fixed groups such as number shapes which helps to show the link between multiplication and division.</p>

Skill – Understand halving as splitting objects into 2 equal groups	Year 1 / 2
 <p>Can you put these objects into 2 equal groups and understand that this has the special name: halving?</p>	<p>Record pictorially.</p> <p>Begin to see the link with halving.</p> <p>Year 2 children should begin to halve 2 digit numbers where both digits are even.</p> <p>Halve the tens and halve the ones.</p> <p>Part whole diagrams will allow children to record in a way directly linked to the visual representations / manipulatives used.</p>

Skill: Divide 2-digits by 1-digit (sharing with no exchange)	Year: '2 /3
	<p>When dividing larger numbers, children can use manipulatives that allow them to partition into tens and ones.</p> <p>Straws, Base 10 and place value counters can all be used to share numbers into equal groups.</p> <p>Part-whole models can provide children with a clear written method that matches the concrete representation.</p>

Skill- Halve any even 2 digit number and odd numbers to 20	Year 3
<p>All of the visual images and manipulatives used to support this skill in Year 2</p> <p>Continue to use part, part whole diagrams to record / calculate</p> <p>Flexible partitioning to be developed for trickier numbers</p>  <p>Play doh or other materials like it can be used to show how odd numbers can be halved.</p> <p>Part whole diagrams where odd numbers such as 15 can be partitioned into 14 and 1 for example will also support this method.</p>	<p>Part whole diagrams to encourage development of a mental method for calculating halves of numbers</p>

Skill: Divide 2-digits by 1-digit (sharing with exchange)	Year: 3/4
--	------------------

Tens	Ones
[Rod]	[2 Units]
[Rod]	[2 Units]
[Rod]	[2 Units]
[Rod]	[2 Units]

52

?	?	?	?
---	---	---	---

$52 \div 4 = 13$

52

40
 $\div 4 \downarrow$
 10

12
 $\div 4 \downarrow$
 3

 $10 + 3 = 13$

When dividing numbers involving an exchange, children can use Base 10 and place value counters to exchange one ten for ten ones. Children should start with the equipment outside the place value grid before sharing the tens and ones equally between the rows.

Flexible partitioning in a part-whole model supports this method.

Skill: Divide 2-digits by 1-digit (sharing with remainders)	Year: 4
--	----------------

Tens	Ones
[Rod]	[3 Units]
[Rod]	[3 Units]
[Rod]	[3 Units]
[Rod]	[3 Units]

53

13	13	13	13	1
----	----	----	----	---

$53 \div 4 = 13 \text{ r}1$

53

40
 $\div 4 \downarrow$
 10

13

12
 $\div 4 \downarrow$
 3

1

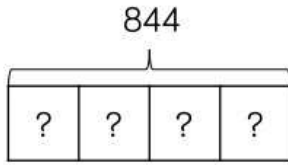
When dividing numbers with remainders, children can use Base 10 and place value counters to exchange one ten for ten ones. Starting with the equipment outside the place value grid will highlight remainders, as they will be left outside the grid once the equal groups have been made.

Flexible partitioning in a part-whole model supports this method.

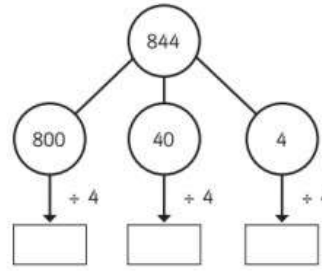
Skill: Divide 3-digits by 1-digit (sharing)

Year: 4

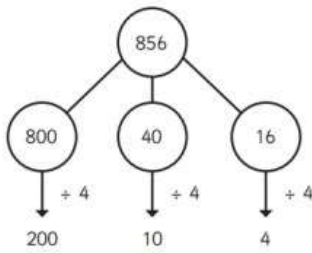
$844 \div 4 = 211$



H	T	O



$844 \div 4 = 211$



Hundreds	Tens	Ones

Children can continue to use place value counters to share 3-digit numbers into equal groups. Children should start with the equipment outside the place value grid before sharing the hundreds, tens and ones equally between the rows. This method can also help to highlight remainders. Flexible partitioning in a part-whole model supports this method.

Skill: to be able to halve numbers to 1,000

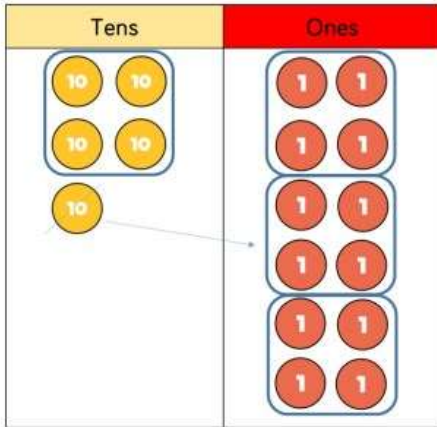
Year 4

Use base 10
Part, whole models to support understanding and calculations

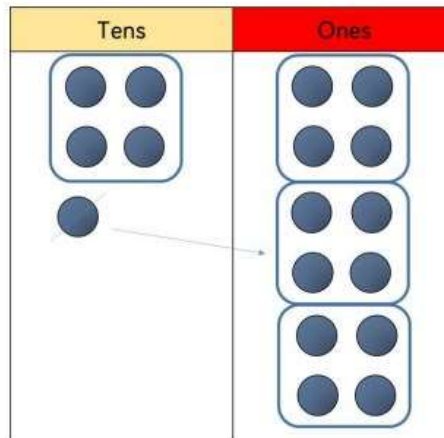
Children should be able to look for patterns eg: half of 3 helps with half of 30 and half of 300.

Skill: Divide 2-digits by 1-digit (grouping)

Year: 5



		1	3	
	4	5	12	



$52 \div 4 = 13$

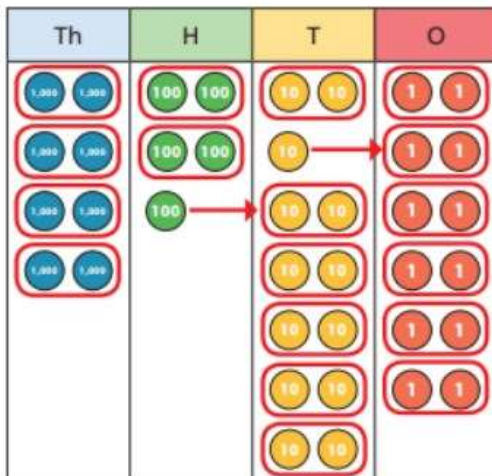
When using the short division method, children use grouping. Starting with the largest place value, they group by the divisor.

Language is important here. Children should consider 'How many groups of 4 tens can we make?' and 'How many groups of 4 ones can we make?'

Remainders can also be seen as they are left ungrouped.

Skill: Divide 4-digits by 1-digit (grouping)

Year: 5



	4	2	6	6
2	8	5	13	12

$8,532 \div 2 = 4,266$

Place value counters or plain counters can be used on a place value grid to support children to divide 4-digits by 1-digit. Children can also draw their own counters and group them through a more pictorial method.

Children should be encouraged to move away from the concrete and pictorial when dividing numbers with multiple exchanges.

Skill: Divide multi-digits by 2-digits (long division)	Year: 6																															
<div style="display: flex; justify-content: space-between;"> <table border="1" style="border-collapse: collapse; text-align: center; width: 150px;"> <tr><td></td><td></td><td>0</td><td>3</td><td>6</td></tr> <tr><td>1</td><td>2</td><td>4</td><td>3</td><td>2</td></tr> <tr><td></td><td>-</td><td>3</td><td>6</td><td>0</td></tr> <tr><td></td><td></td><td></td><td>7</td><td>2</td></tr> <tr><td></td><td>-</td><td></td><td>7</td><td>2</td></tr> <tr><td></td><td></td><td></td><td></td><td>0</td></tr> </table> <div style="font-size: small;"> <p>(x30)</p> <p>(x6)</p> </div> </div> <div style="margin-top: 10px;"> <table style="margin-left: auto; margin-right: auto;"> <tr><td style="border: 1px solid black; border-radius: 15px; padding: 5px 20px;">$432 \div 12 = 36$</td></tr> </table> </div> <div style="margin-top: 10px;"> <p>Use 'coin' method:</p> <p>$1 \times 23 = 23$</p> <p>$2 \times 23 = 46$</p> <p>$5 \times 23 = 115$</p> <p>$10 \times 23 = 230$</p> <p>$20 \times 23 = 460$</p> <p>$50 \times 23 = 1150$</p> </div>			0	3	6	1	2	4	3	2		-	3	6	0				7	2		-		7	2					0	$432 \div 12 = 36$	<p>Children can also divide by 2-digit numbers using long division.</p> <p>Children to be able to convert remainders to fractions if appropriate.</p> <p>Children will also solve problems with remainders where the quotient can be rounded as appropriate.</p>
		0	3	6																												
1	2	4	3	2																												
	-	3	6	0																												
			7	2																												
	-		7	2																												
				0																												
$432 \div 12 = 36$																																

Appendix 1

Number facts (answers children are expected to remember and recall) and mental calculations (calculations which children should eventually be able to carry out mentally):

Note: times tables in Appendix 2

Number facts:

EYFS: bonds to 5

Year 1: bonds to 10 and within 10.

Doubles to 10 (up to 5+5)

Year 2: bonds to and within 10, bonds to 20, multiples of 10 to 100

Doubles and halves within 20 (up to 10+ 10)

Year 3: Doubles and halves of all numbers to 20

Year 4: 25 x table

Year 5: 15 x table

Mental calculations:

Year 2: Adding and subtracting 10 (and multiples of 10)

Adding a single digit to a multiple of 10: $30 + 3 = 33$

Subtracting back to a multiple of 10 : $65 - 5 = 60$

Year 3: Addition of 2 digit number with 1 digit number (within 100)

Addition of 2 digit and 2 digit number within 100

Subtraction of 1 digit from 2 digit numbers

Subtraction of 2 2 digit numbers

Doubling of 2 digit numbers (without crossing 10's boundary)

Halving of 2 digit numbers (where both digits are even)

Year 4: Doubling of any 2 digit numbers

Halving of any 2 digit even number

Halving numbers to 20

Multiply by multiples of 10

Multiply and divide by 10, 100, (not using decimals)

Year 5: Multiply 2 digit by single digit number

Divide 2 digit by single digit number

Halving any 2 digit number

Multiply and divide by multiples of 10, 100 (where linked to tables facts)

Multiply and divide by 10 and 100 (using decimals as well)

Appendix 2

Times Tables

This is a breakdown of times tables; what should be taught when and what that teaching should look like.

During the Summer Term, the children in Year 4 sit the Multiplication Tables Check in line with the Government's assessment framework.

Times tables continue to be recalled and tested throughout Years 5 and 6.

Arrays

Arrays

Arrays

Recall and use multiplication and division facts for the 3-times table	3	Hundred square Number shapes Counters	Arrays	Bead strings Number lines Everyday objects
Recall and use multiplication and division facts for the 4-times table	3	Hundred square Number shapes Counters	Arrays	Bead strings Number lines Everyday objects
Recall and use multiplication and division facts for the 8-times table	3	Hundred square Number shapes	Arrays	Bead strings Number tracks Everyday objects
Recall and use multiplication and division facts for the 6-times table	4	Hundred square Number shapes	Arrays	Bead strings Number tracks Everyday objects

Skill	Year	Representations and models		
Recall and use multiplication and division facts for the 7-times table	4	Hundred square Number shapes	Arrays	Bead strings Number lines
Recall and use multiplication and division facts for the 9-times table	4	Hundred square Number shapes	Arrays	Bead strings Number lines
Recall and use multiplication and division facts for the 11-times table	4	Hundred square Base 10	Arrays	Place value counters Number lines
Recall and use multiplication and division facts for the 12-times table	4	Hundred square Base 10	Arrays	Place value counters Number lines

Appendix 3

Mathematical Vocabulary

	Addition	Subtraction	Multiplication	Division
EYFS	Number bond Add Plus How many more? How many ways can you make? 5 frame	Take away Less than minus Subtract Subtraction Jumping back How many are left? Subtract 1 is equals subitise	Group of Skip counting Doubling	
Year 1	Number bond Add Plus How many more? How many ways can you make? 10 frame Missing number Altogether	Subtract Subtraction Less than Minus difference method	Group of Groups of Equal groups Unequal groups Array Columns Rows Repeated addition Double 2 groups of 2 lots of	Share Group Equal Array Can you share these objects between 4 people or into 4 groups? Can put these objects into groups of 4?
Year 2	Number bond Group of 10 Add Addition Plus 10 frame	Subtract Subtraction Less than Minus difference method	Times Array Columns Rows Lots of	Halve Half Share ÷ ½ Group

	Doubles Altogether Total	Partition Count back inverse	Times table Commutative Multiple (count of...) Inverse operation 2 equal groups of Double the tens Double the ones	Array Divide Division
Year 3	Number bond Group of 10 Add Addition Plus Multiple of 10 Place value Place value grid Hundreds, tens and ones Altogether Total	Subtraction Minus Difference Count back Inverse Exchanging Less than Column	Times Array Columns Rows Lots of Times table Commutative Multiple (count of...) Commutative Factor Product Number family Inverse operation	Half Halve Double Inverse $\frac{1}{2}$ \div Flexible partitioning Group Share Divide Division
Year 4	Number bond Group of 10 Add Addition Plus Multiple of 10 Place value Place value grid Thousands, hundreds, tens and ones Altogether Total Sum of	Subtraction Minus Difference Count back Inverse Exchanging Less than Column Decrease	Commutative Multiple Factor Product Number family Inverse operation	Half Halve Double Inverse $\frac{1}{2}$ \div Flexible partitioning Group Share Divide Division Remainders
Year 5	Number bond Group of 10 Add Addition Plus Multiple of 10 Place value Place value grid Tens of Thousands, thousands, hundreds, tens and ones Thousandths, Hundredths, tenths and ones Decimals Decimal point Altogether Total Sum of Increase	Subtraction Minus Difference Count back Inverse Exchanging Less than Decrease Reduce Column Decimal	Commutative Multiple Factor Product Number family Inverse operation Long multiplication	Half Halve Double Inverse $\frac{1}{2}$ \div Flexible partitioning Group Share Divide Division Remainders Divisor Quotient
Year 6	Number bond	Subtraction	Commutative	Half

	Group of 10 Add Addition Plus Multiple of 10 Place value Place value grid Thousandths, Hundredths, tenths and ones Decimals Decimal point Altogether Increase Total More than Sum of	Minus Difference Count back Inverse Exchanging Less than Column Decimal Decrease Reduce Take away	Multiple Factor Product Number family Inverse operation Long multiplication Double Increase Lots of Multiply Times	Halve Double Inverse $\frac{1}{2}$ \div Flexible partitioning Group Share Divide Division Remainders Divisor Quotient
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