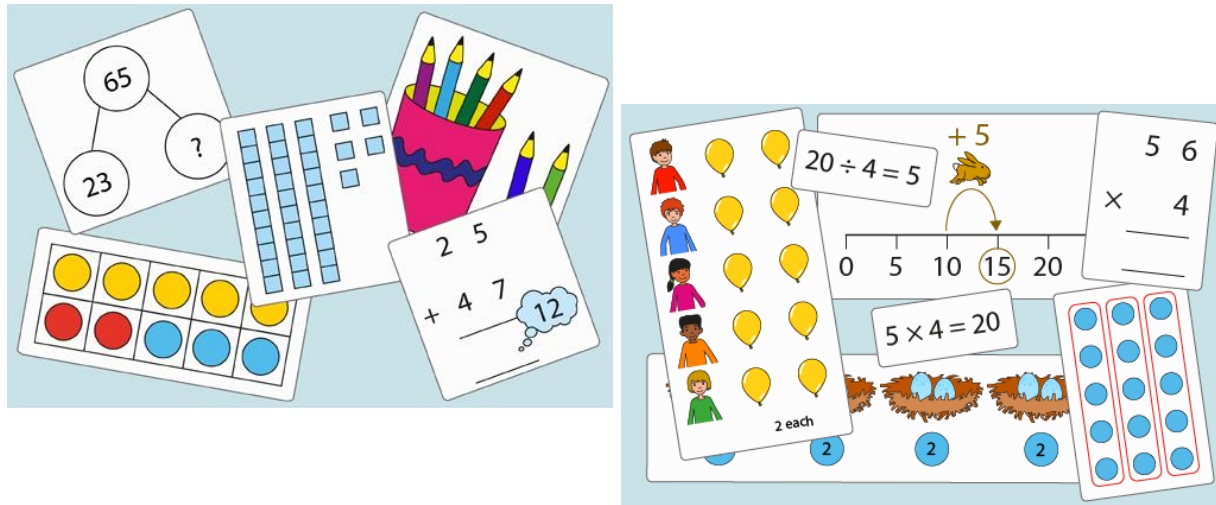


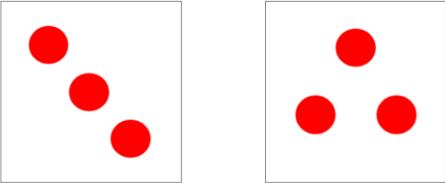
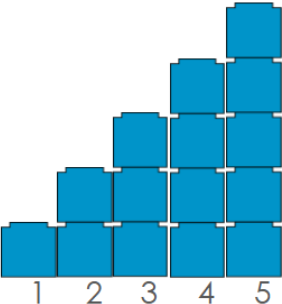
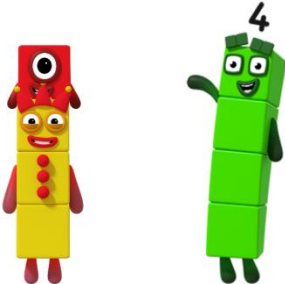


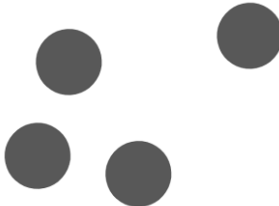
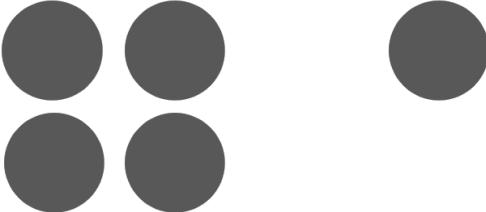
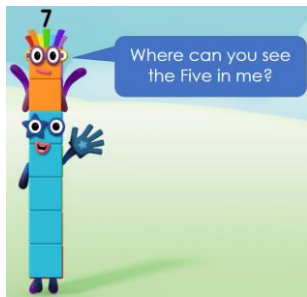
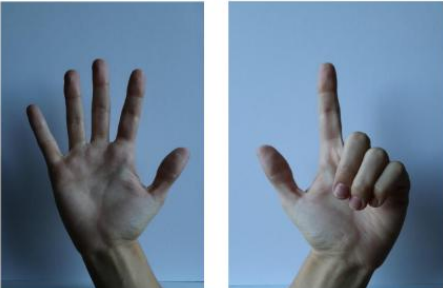
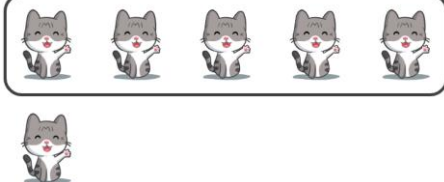
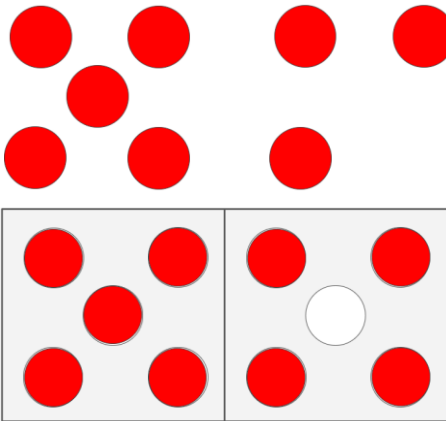
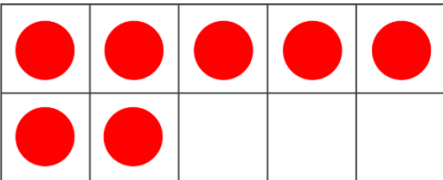
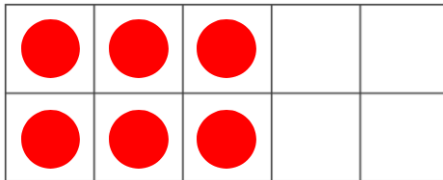
RAMSBURY SCHOOL CALCULATION POLICY

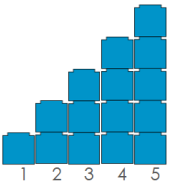
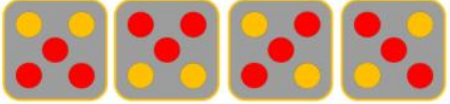
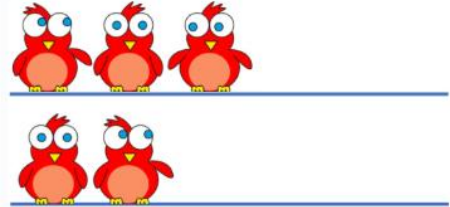
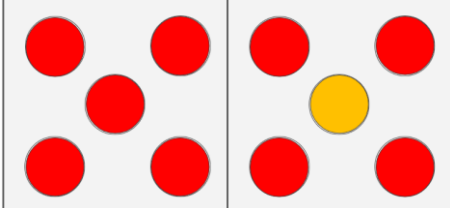
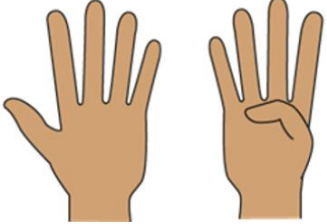
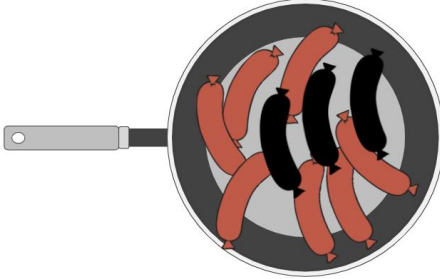
January 2026

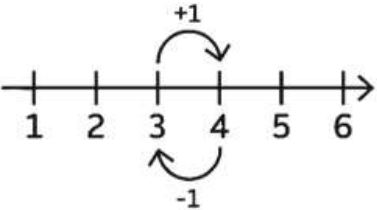
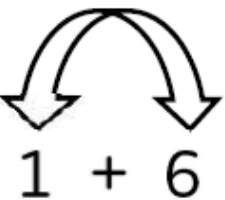
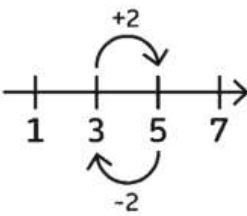
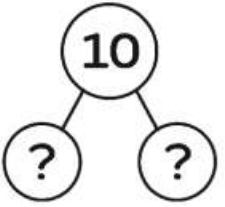


ADDITION

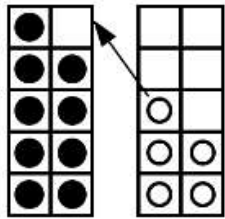
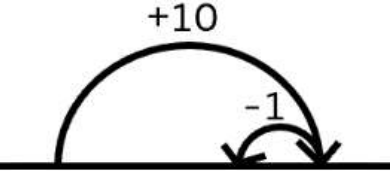
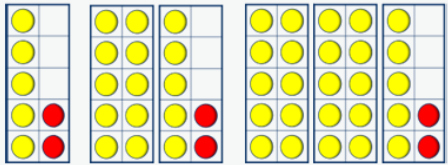
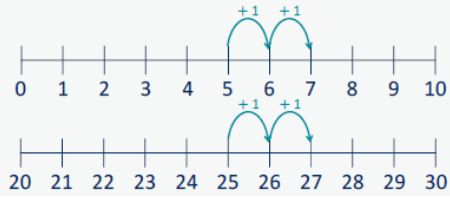
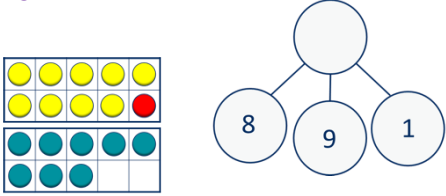
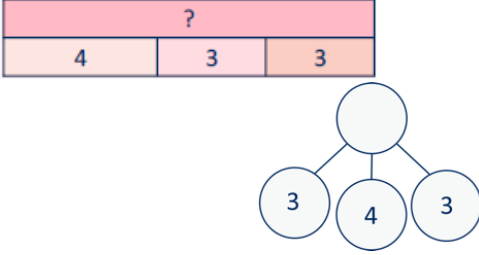
RECEPTION	Mastering Number		
Progression of skills	Representations		Vocabulary
Subitise different arrangements, both unstructured and structured, including using the Hungarian number frame			1 more add add more altogether first now part whole
Connect the counting sequence to the 'staircase' pattern of the counting numbers, seeing that each number is made of one more than the previous number			
Understand that all numbers can be made from ones	 1 and another 1 is 2.		

Make different arrangements of numbers within 5 and talk about what they can see, to develop their conceptual subitising skills						
Spot smaller numbers 'hiding' inside larger numbers				What number is this? How do you know?		
						
Explore the structure of the numbers 6 and 7 as '5 and a bit' and connect this to finger patterns and the Hungarian number frame	 7 is made of 5 and 2. 5 and 2 make 7. $5 + 2 = 7$		 6 is made of 5 and 1. 5 and 1 make 6. $5 + 1 = 6$			
Explore a range of representations of numbers, including the 10-frame, and see how doubles can be arranged in a 10-frame	 Five-wise			 Pair-wise		

Begin to generalise about 'one more than' and 'one less than' numbers within 10	3 is 1 more than 2. 	 4 is 1 more than 3.	
Develop conceptual subitising skills including when using a rekenrek		 I can see 5 and 4. I can see 9.	 5 needs 3 to make 8.
Recall number bonds to 5.	 There are 5 spots. 5 is made of 3 and 2. $5 = 3 + 2$		 How many frogs on the log? How many frogs in the pond?
Recall some number bonds to 10.	 9 needs 1 to make 10. 10 is made of 9 and 1.	 10 is made of 9 and 1. 9 and 1 make 10. $9 + 1 = 10$	 10 is made of 3 and 7. 7 and 3 make 10.

YEAR 1	Number Sense Maths	
Progression of skills	Representations	Vocabulary
When we add one, we get the next counting number.	 $3 + 1 = 4$	addition add together addend double efficient equal to fact family greater group inverse near double number bond plus symbol systematic total algebra 1 more add add more altogether first now part whole
When the order of the two numbers being added (addends) is exchanged, the total remains the same. Sometimes, reversing the order of the two addends makes addition easier to think about conceptually.	 $1 + 4 = 4 + 1$	
If we add two to a number we go from odd to next odd, or even to next even.	 $1, 3, 5, 7, 9$ $2, 4, 6, 8, 10$ $3 + 2 = 5$	
Use number bonds to 10 to solve related equations.	 $3 + 7 = 10$ $7 + 3 = 10$ $6 + 4 + 2 = 10 + 2$	

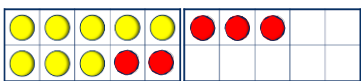
The numbers 6, 7, 8 and 9 are made up of '5 and a bit'. This can be shown on hands to support decomposition of these numbers into their five and a bit parts.	$5 + 3 = 8$	
When we add zero to a number, the number remains the same.	$7 + 0 = 7$	
Know off by heart doubles of numbers to 10. Use these known facts to calculate near doubles and hidden doubles.	If I know that $6 + 6 = 12$, I can easily calculate $6 + 7$ and $5 + 7$.	
Visualise these images to support addition facts for 7 and 9.	$3 + 4 = 7$ $4 + 3 = 7$ $3 + 6 = 9$ $6 + 3 = 9$	
The numbers 11 to 20 are made up of '10 and a bit'.	$2 + 10 = 12$ $10 + 2 = 12$	

YEAR 2		Number Sense Maths and White Rose Maths		
Progression of skills	Representations			Vocabulary
Additions which cross the 10 boundary can be calculated by 'Making Ten' first.	 $9 + 5 =$ $9 + 1 = 10$ and 4 more makes 14.			calculation exchange method multiple one(s) operation partition related facts ten(s) value increase sum algebra
Any addition can be calculated by adjusting from a fact you know already.	 $6 + 9$ is one less than $6 + 10$.			addition addend double efficient equal to fact family greater group inverse near double number bond plus systematic total
Add ones to any number (related facts). Make links to known facts.	I know that ... and ... = ... so ... and ... = ... 	... more than ... is ... so ... more than ... is ... 	What do you notice? Can you continue the pattern? $5 + 2 = 7$ $15 + 2 = 17$ $25 + 2 = 27...$	
Add three 1-digit numbers Prompt children to understand that addition can be done in any order and to make links to known facts.	... and ... are a bond to 10 $10 + ... = ...$ 	Double ... + ... = ... 	What do you notice? Which addition is the easiest to calculate? $8 + 9 + 1 =$ $8 + 1 + 9 =$ $9 + 1 + 8 =$	

Add across a 10

Partition the number being added to make a full ten.

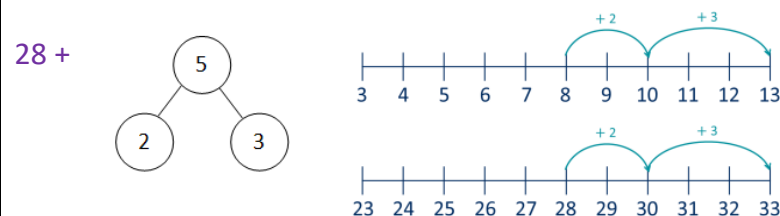
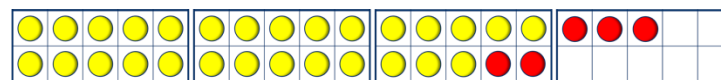
... can be partitioned into ... and ...



I add ... to get to ... then I add ...

$$8 + 5 = 13$$

$$28 + 5 = 33$$

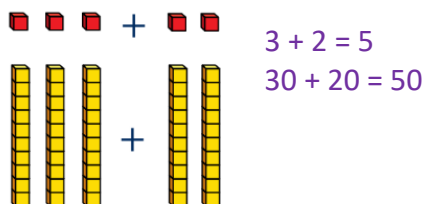


add
altogether
part
whole

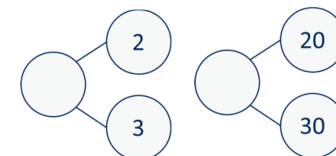
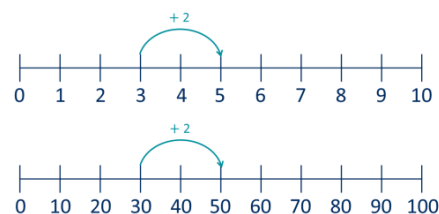
Add multiples of 10

Make links to known facts within ten.

... ones + ... ones = ... ones
so ... tens + ... tens = ... tens



What is the same?
What is different?



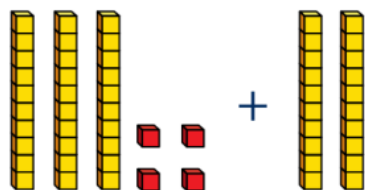
?	
2	3

?	
20	30

Add 10s to any number

Make links to known facts.

... tens + ... tens = ... tens
... tens and ... ones = ...



To add ... I need to add 10 ... times.

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
51	52	53	54	55	56	57	58	59	60

I know that ... and ... = ... so ... and ... = ...

$$30 + 20 = 50$$

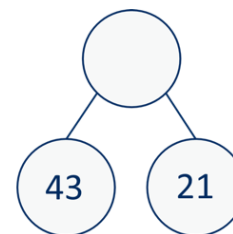
$$34 + 20 = 54$$

Add 2-digit numbers (not across a ten)

Lining up ones and tens in columns will support with later written methods.

... ones + ... ones = ... ones
... tens + ... tens = ... tens

3 ones + 1 one = 4 ones
4 tens + 2 tens = 6 tens
6 tens + 4 ones = 64



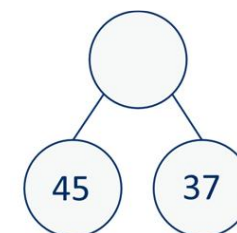
?	
43	21

Add 2-digit numbers (across a ten)

Begin to exchange 10 ones for 1 ten.

There are Ones, so I do/do not need to make an exchange.
... ones = ... ten and ... ones

5 ones + 7 ones = 12 ones
12 ones = 1 ten and 2 ones
4 tens + 3 tens + 1 ten = 8 tens
8 tens and 2 ones = 82



?	
45	37

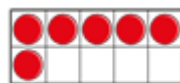
Algebra (missing numbers)

Solve algebra (missing number) problems and use the inverse to check.

How many more do you need to make ...?

$$6 + \square = 10$$

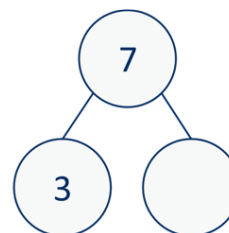
$$10 - \square = 6$$



If ... is a whole and ... is a part, then ... is the other part.

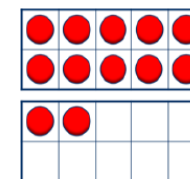
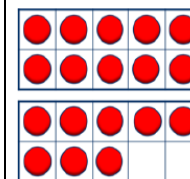
$$\square + 3 = 7$$

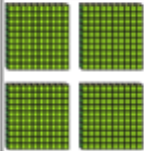
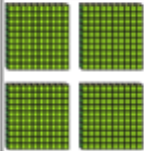
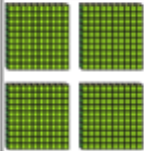
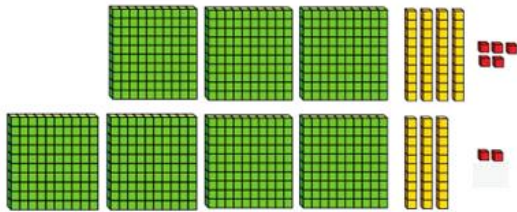
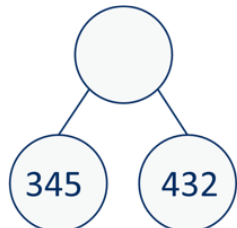
$$7 - \square = 3$$



... can be partitioned into ... and ...

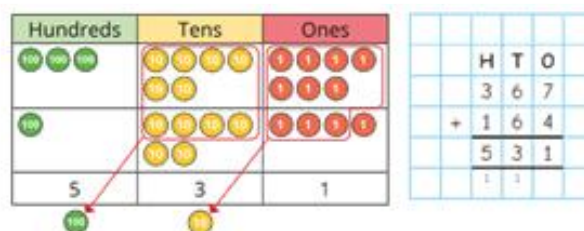
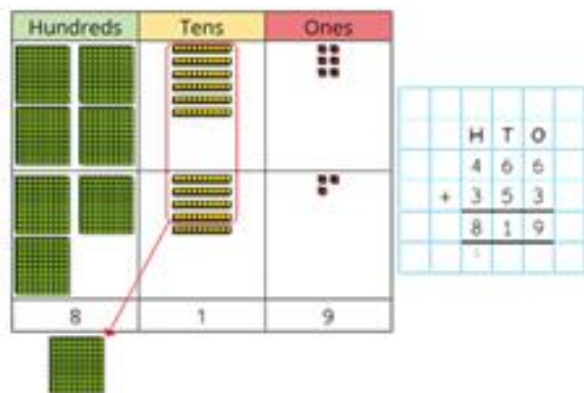
$$10 + 8 = 12 + \square$$



YEAR 3	White Rose Maths																														
Progression of skills	Representations		Vocabulary																												
Add 1s, 10s or 100s to a 3-digit number Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.	The ones/tens/hundreds column will increase by ... <table><tr><th>Hundreds</th><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td><td></td></tr></table> <table><tr><th>H</th><th>T</th><th>O</th></tr><tr><td></td><td></td><td></td></tr></table> 444 + 5 = 444 + 50 = 444 + 500 = 777 + 2 = 777 + 20 = 777 + 200 =	Hundreds	Tens	Ones				H	T	O				What patterns do you notice? 235 + 3 = 235 + 30 = 235 + 300 = 604 + 20 = 604 + 50 = 604 + 90 = 111 + □ = 118 111 + □ = 181 111 + □ = 811	column addition digit estimate exchange hundred(s) inverse crossing the 10 crossing the 100 algebra calculation exchange method multiple operation partition related facts value increase sum																
Hundreds	Tens	Ones																													
																															
H	T	O																													
																															
Add two numbers (no exchange) Mental strategies and introduction of formal written method.	... ones + ... ones = ... ones ... tens + ... tens = ... tens ... hundreds + ... hundreds = ... hundreds  <table><tr><th>Hundreds</th><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table> <table><tr><th>H</th><th>T</th><th>O</th></tr><tr><td>3</td><td>4</td><td>5</td></tr><tr><td>+</td><td>4</td><td>3</td></tr><tr><td colspan="3"> </td></tr><tr><td></td><td></td><td></td></tr></table>  <table><tr><th colspan="2">?</th></tr><tr><td>345</td><td>432</td></tr></table>		Hundreds	Tens	Ones							H	T	O	3	4	5	+	4	3							?		345	432	
Hundreds	Tens	Ones																													
																															
																															
H	T	O																													
3	4	5																													
+	4	3																													
?																															
345	432																														

Add two numbers across a 10 or 100

Formal written method involving up to 2 exchanges including 3-digit plus 2-digit numbers.



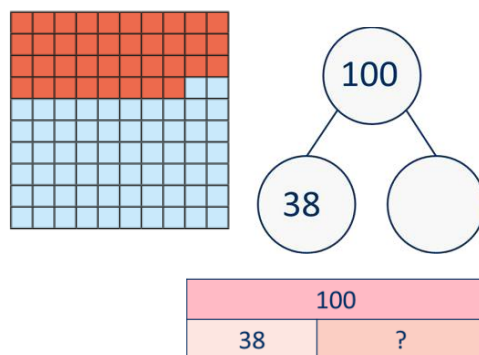
addition
addend
double
efficient
equal to
fact family
greater
group
near double
number bond
plus
systematic
total

add
altogether
part
whole

Complements to 100

Pairs of numbers which total 100

... plus ... is equal to 100



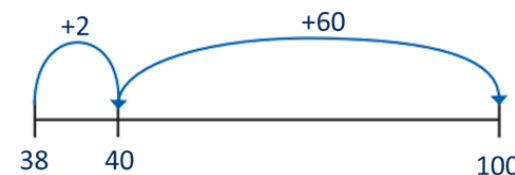
I add ... to get to the next 10, then ... to get to 100

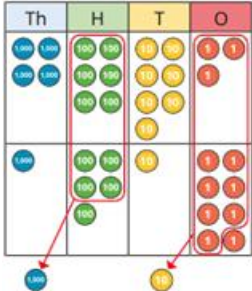
$$38 + 62 = 100$$

$$62 + 38 = 100$$

$$100 = 38 + 62$$

$$100 = 62 + 38$$



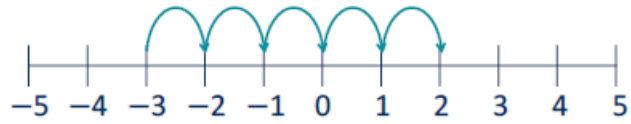
YEAR 4		White Rose Maths	
Progression of skills	Representations		Vocabulary
Add 1s, 10s and 100s to a 4-digit number Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.	The ones/tens/hundreds/thousands column will increase by ...  3,425 + 3 = 3,425 + 30 = 3,425 + 300 = 3,425 + 3,000 =	What patterns do you notice? 2,350 + 3 = 2,350 + 30 = 2,350 + 300 = 2,350 + 3,000 = 6,040 + 200 = 2,211 + □ = 2,251 6,040 + 500 = 2,211 + □ = 2,215 6,040 + 900 = 2,211 + □ = 2,511	efficient inverse round thousand(s) algebra place holder crossing the __ boundary column addition digit estimate exchange calculation exchange method multiple operation partition related facts value increase sum addend equal to near double plus systematic total
Add up to two 4-digit numbers Formal written method with up to 3 exchanges. Encourage children to estimate and use inverse operations to check answers to calculations.	There are ... ones/tens/hundreds so I do/do not need to make an exchange. I can exchange 10 ... for 1 ...  		

YEAR 6	White Rose Maths																																																																																					
Progression of skills	Representations		Vocabulary																																																																																			
Add integers up to 10 million Encourage children to estimate and use inverse operations to check answers to calculations.	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td>3</td><td>4</td><td>6</td><td>2</td><td>2</td><td>1</td><td></td></tr><tr><td></td><td>+</td><td>1</td><td>8</td><td>4</td><td>3</td><td>2</td><td>1</td><td></td></tr><tr><td></td><td></td><td>5</td><td>3</td><td>0</td><td>5</td><td>4</td><td>2</td><td></td></tr><tr><td></td><td></td><td>1</td><td>1</td><td></td><td></td><td></td><td></td><td></td></tr></table> <table><tr><td colspan="3">?</td></tr><tr><td>2,354</td><td>750</td><td>1,500</td></tr></table> <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td>8</td><td>1</td><td></td><td>8</td><td>5</td><td></td></tr><tr><td></td><td>+</td><td></td><td></td><td>0</td><td>6</td><td></td><td></td></tr><tr><td></td><td></td><td>9</td><td>9</td><td>5</td><td></td><td>8</td><td></td></tr></table>													3	4	6	2	2	1			+	1	8	4	3	2	1				5	3	0	5	4	2				1	1						?			2,354	750	1,500											8	1		8	5			+			0	6					9	9	5		8		order of operations accurate approximate strategy
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	+			0	6																																																																																	
		9	9	5		8																																																																																
Order of operations Calculations in brackets should be done first. Multiplication and division should be performed before addition and subtraction. *When no brackets are shown and the operations have the same priority, work left to right.	... has greater priority than ..., so the first part of the calculation I need to do is ... () powers × and ÷ + and - ●●●●●● ●●●●●● $(3 + 4) \times 2 = 14$ ●●●●●● ●●●●●● $3 \times 4 + 2 = 14$ ●●●●●● ●●●●●● $3 + 4 \times 2 = 11$		efficient inverse round thousand(s) place holder crossing the __ boundary column addition digit estimate exchange calculation exchange method multiple operation partition related facts value increase sum																																																																																			

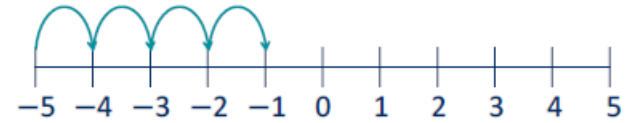
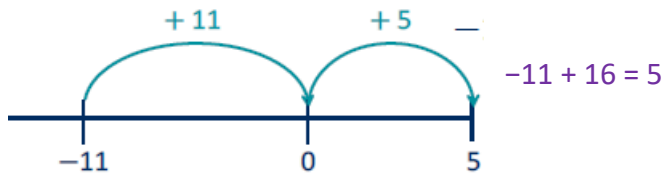
Negative numbers

Children add to negative numbers and carry out calculations which cross 0

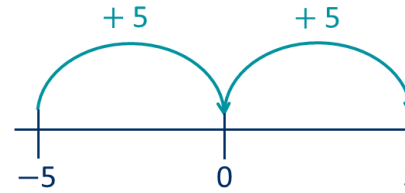
... plus ... is equal to ...



$$-3 + 5 = 2$$



The difference between -5 and -1 is 4

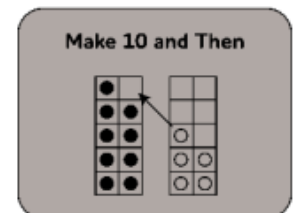
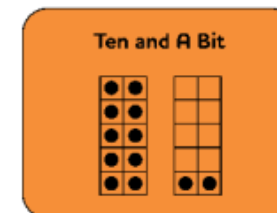
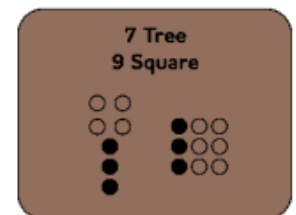
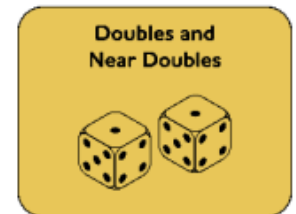
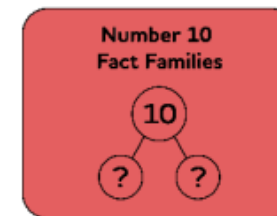
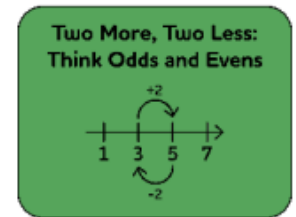
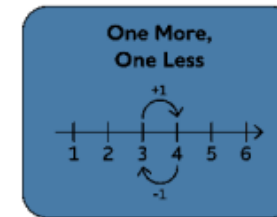
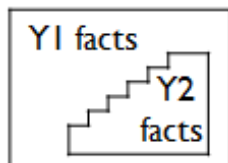


The difference between -5 and 5 is 10

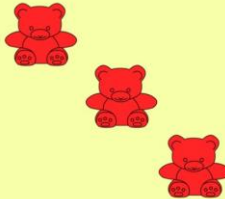
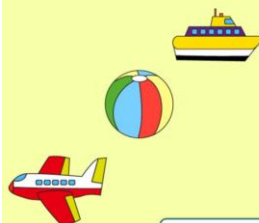
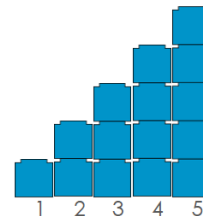
addend

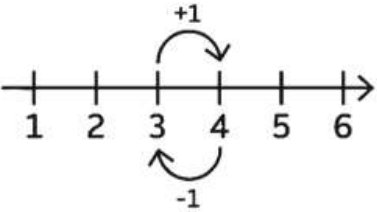
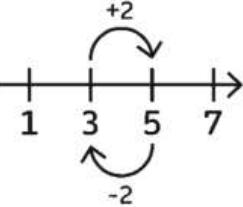
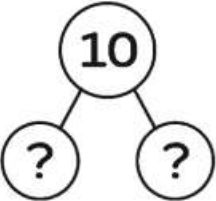
ADDITION FACTS (Number Sense Maths, Number Facts Fluency)

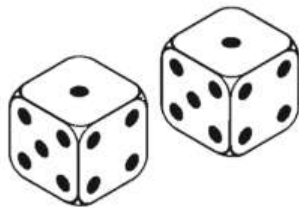
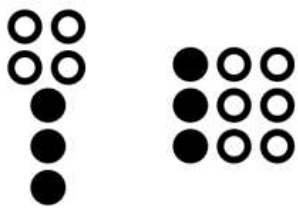
+	0	1	2	3	4	5	6	7	8	9	10
0	0+0	0+1	0+2	0+3	0+4	0+5	0+6	0+7	0+8	0+9	0+10
1	1+0	1+1	1+2	1+3	1+4	1+5	1+6	1+7	1+8	1+9	1+10
2	2+0	2+1	2+2	2+3	2+4	2+5	2+6	2+7	2+8	2+9	2+10
3	3+0	3+1	3+2	3+3	3+4	3+5	3+6	3+7	3+8	3+9	3+10
4	4+0	4+1	4+2	4+3	4+4	4+5	4+6	4+7	4+8	4+9	4+10
5	5+0	5+1	5+2	5+3	5+4	5+5	5+6	5+7	5+8	5+9	5+10
6	6+0	6+1	6+2	6+3	6+4	6+5	6+6	6+7	6+8	6+9	6+10
7	7+0	7+1	7+2	7+3	7+4	7+5	7+6	7+7	7+8	7+9	7+10
8	8+0	8+1	8+2	8+3	8+4	8+5	8+6	8+7	8+8	8+9	8+10
9	9+0	9+1	9+2	9+3	9+4	9+5	9+6	9+7	9+8	9+9	9+10
10	10+0	10+1	10+2	10+3	10+4	10+5	10+6	10+7	10+8	10+9	10+10



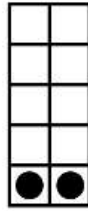
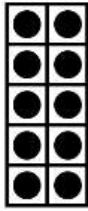
SUBTRACTION

RECEPTION	Mastering Number						
Progression of skills	Representations				Vocabulary		
Compare quantities and numbers, including sets of objects which have different attributes	Pat 	Sam 	Pat has fewer than Sam.	Pat  _____ has more than _____ _____ has fewer than _____	Sam 	Sam has more than Pat. Pat has fewer than Sam.	1 less first left now part take away whole
Begin to identify missing parts for numbers within 5		$3 - 1 = 2$		3 needs 2 to make 5. $5 - 2 = 3$			
Begin to identify missing parts for numbers within 10			How many ducks have flown away? $7 - 2 = 5$				
begin to generalise about 'one more than' and 'one less than' numbers within 10	3  2 is 1 less than 3. $3 - 1 = 2$	 1 2 3 4 5 3 is 1 less than 4.					

YEAR 1	Number Sense Maths	
Progression of skills	Representations	Vocabulary
When we subtract one, we get the previous counting number.	 $4 - 1 = 3$	subtraction subtract difference double efficient equal to fact family greater group inverse less minus near double number bond symbol systematic algebra 1 less first left now part take away whole
If we subtract two from a number we go from odd to previous odd, or even to previous even.	 $9, 7, 5, 3, 1$ $8, 6, 4, 2$ $5 - 2 = 3$	
Use number bonds to 10 to solve related equations.	 $10 - 7 = 3$ $10 - 3 = 7$	
The numbers 6, 7, 8 and 9 are made up of '5 and a bit'. This can be shown on hands to support decomposition of these numbers into their five and a bit parts.	 $8 - 3 = 5$ $8 - 5 = 3$	

When we subtract zero from a number, the number remains the same.	$7 - 0 = 7$									
When we subtract a number from itself, the difference is 0.	$7 - 7 = 0$									
Know off by heart doubles of numbers to 10. Use these doubles to calculate near doubles and hidden doubles. $6 + 6 = 12$ can be used to solve $12 - 6$, $11 - 6$ or $12 - 5$.		$12 - 6 = 6$ $11 - 6 = 6 - 1 = 5$ $12 - 5 = 6 + 1 = 7$								
Adjacent numbers have a difference of 1. Adjacent odds and evens have a difference of 2.		Spot number neighbours (adjacent) to solve subtractions of adjacent numbers. $4 - 3 = 1$ Spot number neighbours (odds) to solve subtractions of adjacent numbers. $5 - 3 = 2$ Spot number neighbours (adjacent, odds or evens) to solve subtractions of adjacent numbers. $6 - 4 = 2$								
Visualise these images to support subtraction facts for 7 and 9.		<table><tr><td>$4 + 3 = 7$</td><td>$6 + 3 = 9$</td></tr><tr><td>$3 + 4 = 7$</td><td>$3 + 6 = 9$</td></tr><tr><td>$7 - 4 = 3$</td><td>$9 - 6 = 3$</td></tr><tr><td>$7 - 3 = 4$</td><td>$9 - 3 = 6$</td></tr></table>	$4 + 3 = 7$	$6 + 3 = 9$	$3 + 4 = 7$	$3 + 6 = 9$	$7 - 4 = 3$	$9 - 6 = 3$	$7 - 3 = 4$	$9 - 3 = 6$
$4 + 3 = 7$	$6 + 3 = 9$									
$3 + 4 = 7$	$3 + 6 = 9$									
$7 - 4 = 3$	$9 - 6 = 3$									
$7 - 3 = 4$	$9 - 3 = 6$									

The numbers 11 to 20
are made up of '10 and
a bit'.



$$12 - 10 = 2$$

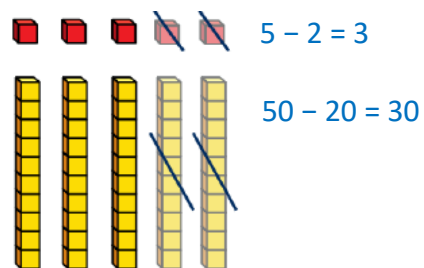
$$12 - 2 = 10$$

YEAR 2	Number Sense Maths and White Rose Maths		
Progression of skills	Representations		Vocabulary
Subtractions which cross the 10 boundary can be calculated by 'Subtracting to Ten' first.	$14 - 5 =$ $14 - 4 = 10$ $10 - 1 = 9$		calculation exchange method multiple one(s) operation
Any subtraction can be calculated by adjusting from a fact you know already.	$16 - 9$ is one more than $16 - 10$.		partition related facts ten(s) value decrease algebra
Subtract ones from any number. (related facts) Make links to known facts.	I know that ... minus ... = ... so ... minus ... = less than ... is ... so ... less than ... is ... What do you notice? Can you continue the pattern? $8 - 3 = 5$ $18 - 3 = 15$ $28 - 3 = 25$...		subtraction subtract difference double efficient equal to fact family
Subtract across a 10 Partition the number being subtracted to bridge through a ten.	... can be partitioned into ... and ... Make links with related facts.		greater group inverse less minus near double number bond symbol

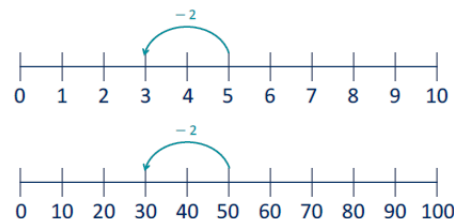
Subtract multiples of 10

Make links to known facts within ten.

... ones - ... ones = ... ones
so ... tens - ... tens = ... tens



What is the same? What is different?



5	
2	?

50	
20	?

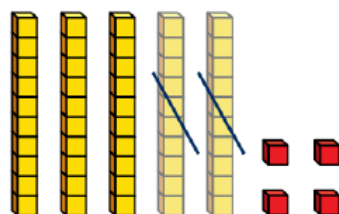
systematic

1 less
first
left
now
part
take away
whole

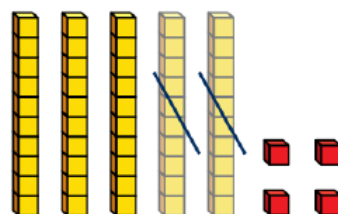
Subtract 10s from any number

Make links to known facts.

... tens - ... tens = ... tens
... tens and ... ones = ...



To subtract ... I need to subtract 10 ... times.



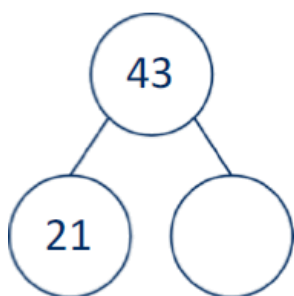
I know that ... minus ... = ...
so ... minus ... = ...

$$50 - 20 = 30$$

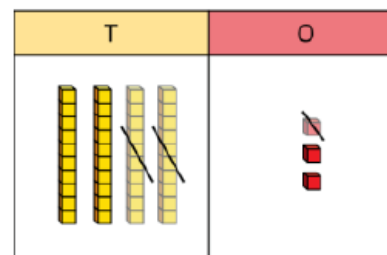
$$54 - 20 = 34$$

Subtract two 2-digit numbers (not across a ten)

... ones - ... ones = ... ones
... tens - ... tens = ... tens



43	
21	?



$$3 \text{ ones} - 1 \text{ one} = 2 \text{ ones}$$

$$4 \text{ tens} - 2 \text{ tens} = 2 \text{ tens}$$

$$2 \text{ tens and } 2 \text{ ones} = 22$$

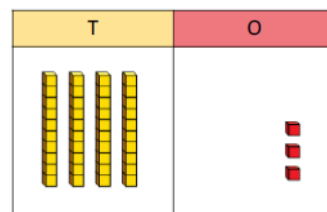
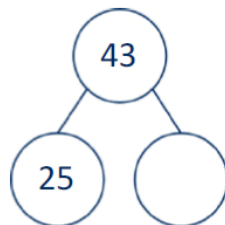
Subtract two 2-digit numbers

(across a ten)

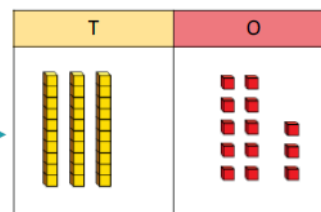
Begin to exchange 1 ten for 10 ones.

I need to make an exchange because I do not have enough ones to subtract ... ones.

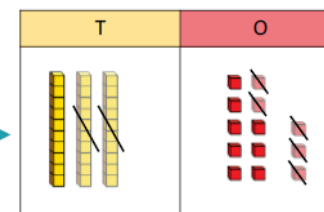
43	
25	?



3 ones – 5 ones
(I need to exchange 1 ten for 10 ones)



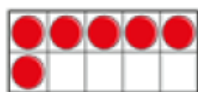
13 ones – 5 ones = 8 ones
3 tens – 2 tens = 1 ten
1 ten and 8 ones = 18



Algebra

Solve missing number problems and use the inverse to check.

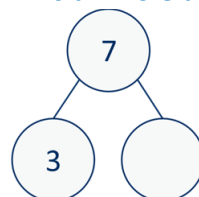
How many do you need to subtract to make ...?



$$10 - \square = 6$$

$$6 + \square = 10$$

If ... is a whole and ... is a part, then ... is the other part.

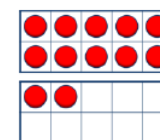
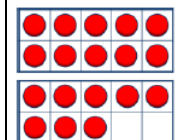


$$7 - 3 = \square$$

$$\square + 3 = 7$$

... can be partitioned into ... and ...

$$18 - \square = 12 + 2$$



YEAR 3	White Rose Maths																					
Progression of skills	Representations		Vocabulary																			
Subtract 1s, 10s and 100s from a 3-digit number Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.	The ones/tens/hundreds column will decrease by ... What patterns do you notice? <table><tr><th>Hundreds</th><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td><td></td></tr></table> <table><tr><th>H</th><th>T</th><th>O</th></tr><tr><td></td><td></td><td></td></tr></table> $444 - 2 =$ $444 - 20 =$ $444 - 200 =$ $777 - 4 =$ $777 - 40 =$ $777 - 400 =$	Hundreds	Tens	Ones				H	T	O				What patterns do you notice? $235 - 3 =$ $235 - 30 =$ $235 - 300 =$ $624 - 20 =$ $654 - 50 =$ $694 - 90 =$ $118 - \square = 111$ $181 - \square = 111$ $811 - \square = 111$	column subtraction digit estimate exchange hundred(s) inverse crossing the 10 crossing the 100 algebra							
Hundreds	Tens	Ones																				
H	T	O																				
Subtract two numbers (no exchange) Mental strategies and introduction of formal written method.	... ones – ... ones = ... ones ... tens – ... tens = ... tens ... hundreds – ... hundreds = ... hundreds	<table><tr><td colspan="2">769</td></tr><tr><td>147</td><td>?</td></tr></table> <table><tr><th>H</th><th>T</th><th>O</th></tr><tr><td>7</td><td>6</td><td>9</td></tr><tr><td>-</td><td>1</td><td>4</td></tr><tr><td colspan="3"> </td></tr><tr><td></td><td></td><td></td></tr></table>	769		147	?	H	T	O	7	6	9	-	1	4							calculation exchange method multiple one(s) operation partition related facts ten(s) value decrease
769																						
147	?																					
H	T	O																				
7	6	9																				
-	1	4																				

Subtract two numbers across a 10 or 100

Formal written method involving up to 2 exchanges including 3-digit subtract 2-digit numbers.

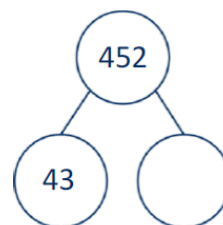
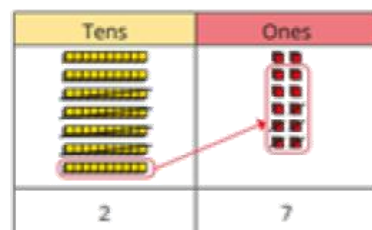
I need to subtract ... ones. I do/do not need to make an exchange.
I need to subtract ... tens. I do/do not need to make an exchange.
I can exchange 1 ... for 10 ...

72	
45	?

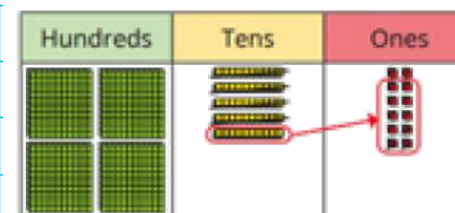
	T	O	
	⁶ 7	¹ 2	
-	4	5	



	H	T	O
	² 3	¹⁵ 6	¹ 5
-	1	7	8
	1	8	7



	H	T	O
	4	⁴ 5	¹ 2
-		4	3
	4	0	9



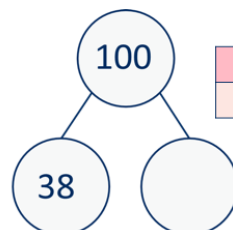
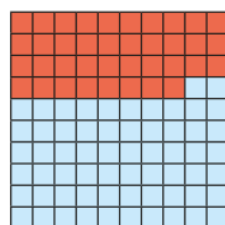
subtraction
subtract
difference
double
efficient
equal to
fact family
greater
group
inverse
less
minus
near double
number bond
symbol
systematic

1 less
first
left
now
part
take away
whole

Complements to 100

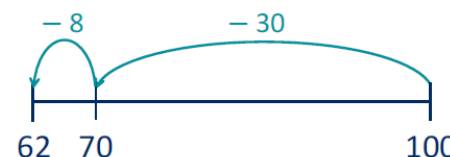
Focus on subtraction facts. Encourage children to notice patterns.

100 minus ... is equal to ...



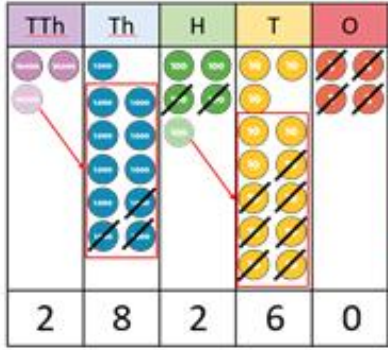
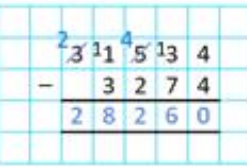
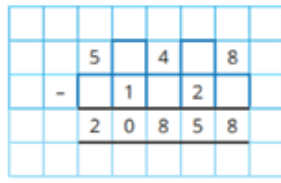
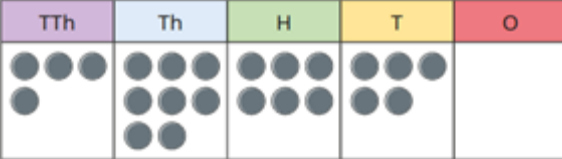
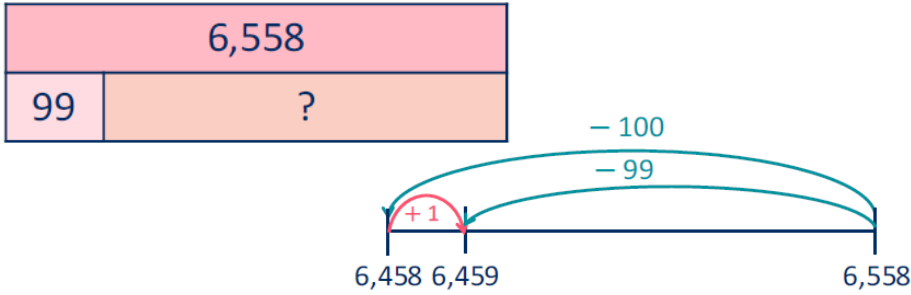
100	
38	?

I subtract ... tens, then I subtract ... ones.



$$\begin{aligned} 100 - 38 &= 62 \\ 100 - 62 &= 38 \\ 62 &= 100 - 38 \\ 38 &= 100 - 62 \end{aligned}$$

YEAR 4	White Rose Maths																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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Subtract 1s, 10s, 100s and 1,000s from a 4-digit number Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.	The ones/tens/hundreds/thousands column will decrease by ... <table><tr><th>Thousands</th><th>Hundreds</th><th>Tens</th><th>Ones</th></tr><tr><td> 1,000 1,000 1,000 </td><td> 100 100 100 100 </td><td> 10 10 </td><td> 1 1 1 1 1 </td></tr></table> 3,425 – 2 = 3,425 – 200 = 3,425 – 20 = 3,425 – 2,000 =	Thousands	Hundreds	Tens	Ones	1,000 1,000 1,000	100 100 100 100	10 10	1 1 1 1 1	What patterns do you notice? 4,356 – 3 = 4,356 – 30 = 4,356 – 300 = 4,356 – 3,000 = 6,940 – 200 = 4,433 – □ = 4,430 6,940 – 300 = 4,433 – □ = 4,033 6,940 – 400 = 4,433 – □ = 4,403	efficient inverse round thousand(s) algebra column subtraction digit estimate exchange crossing the __ boundary																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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I can exchange 1... for 10... <table><tr><th>Th</th><th>H</th><th>T</th><th>O</th></tr><tr><td> 1,000 1,000 1,000 </td><td> 100 100 </td><td> 10 10 10 10 10 10 10 10 </td><td> 1 1 1 1 1 1 1 1 1 1 1 1 </td></tr></table> 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YEAR 5		White Rose Maths	
Progression of skills	Representations		Vocabulary
Subtract whole numbers with more than 4 digits Encourage children to estimate and use inverse operations to check answers to calculations.	I can exchange 1 ... for 10 ...   		accurate approximate constant difference strategy algebra efficient inverse round
Subtract using mental strategies Subtract 1s, 10s, 100s etc from any number. Use number bonds and related facts.	 $48,650 - 300 =$ $48,650 - 30,000 =$ $48,650 - 30 =$	To subtract ..., I can subtract ... then add ... 	column subtraction digit estimate exchange crossing the ___ boundary calculation exchange method operation partition related facts value decrease subtraction subtract less minus

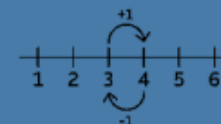
YEAR 6	White Rose Maths																																																																							
Progression of skills	Representations	Vocabulary																																																																						
Subtract integers up to 10 million Encourage children to estimate and use inverse operations to check answers to calculations.	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td>²3</td><td>¹4</td><td>⁵6</td><td>¹2</td><td>2</td><td>1</td></tr><tr><td></td><td>-</td><td>1</td><td>8</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td></td><td></td><td>1</td><td>6</td><td>1</td><td>9</td><td>0</td><td>0</td></tr></table> <table><tr><td colspan="3">4,604</td></tr><tr><td>2,354</td><td>750</td><td>?</td></tr></table> <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td>8</td><td></td><td>4</td><td>8</td><td>5</td><td></td></tr><tr><td></td><td>-</td><td>3</td><td>6</td><td></td><td></td><td></td><td>4</td></tr><tr><td></td><td></td><td></td><td>5</td><td>5</td><td>5</td><td>5</td><td>5</td></tr></table>											² 3	¹ 4	⁵ 6	¹ 2	2	1		-	1	8	4	3	2	1			1	6	1	9	0	0	4,604			2,354	750	?											8		4	8	5			-	3	6				4				5	5	5	5	5	order of operations accurate approximate constant difference strategy
		² 3	¹ 4	⁵ 6	¹ 2	2	1																																																																	
	-	1	8	4	3	2	1																																																																	
		1	6	1	9	0	0																																																																	
4,604																																																																								
2,354	750	?																																																																						
		8		4	8	5																																																																		
	-	3	6				4																																																																	
			5	5	5	5	5																																																																	
Order of operations Children learn the order of priority for operations in a calculation. Calculations in brackets should be done first. Multiplication and division should be performed before addition and subtraction.	... has greater priority than ... , so the first part of the calculation I need to do is ... () powers × and ÷ + and - $8 - 2 \times 3 = 2$ $8 - 2^2 = 4$ $(8 - 2) \times 3 = 18$	efficient inverse round column subtraction digit estimate exchange crossing the __ boundary																																																																						
Negative numbers Children subtract from positive and negative numbers and calculate intervals across 0	... minus ... is equal to ... $-1 - 4 = -5$ $1 - 4 = -3$	The difference between -5 and -1 is 4 The difference between 5 and -5 is 10	calculation exchange method operation partition related facts value decrease subtract minus																																																																					

SUBTRACTION FACTS (Number Sense Maths, Number Facts Fluency)

-	0	1	2	3	4	5	6	7	8	9	10
0	0-0										
1	1-0	1-1									
2	2-0	2-1	2-2								
3	3-0	3-1	3-2	3-3							
4	4-0	4-1	4-2	4-3	4-4						
5	5-0	5-1	5-2	5-3	5-4	5-5					
6	6-0	6-1	6-2	6-3	6-4	6-5	6-6				
7	7-0	7-1	7-2	7-3	7-4	7-5	7-6	7-7			
8	8-0	8-1	8-2	8-3	8-4	8-5	8-6	8-7	8-8		
9	9-0	9-1	9-2	9-3	9-4	9-5	9-6	9-7	9-8	9-9	
10	10-0	10-1	10-2	10-3	10-4	10-5	10-6	10-7	10-8	10-9	10-10
11		11-1	11-2	11-3	11-4	11-5	11-6	11-7	11-8	11-9	11-10
12			12-2	12-3	12-4	12-5	12-6	12-7	12-8	12-9	12-10
13				13-3	13-4	13-5	13-6	13-7	13-8	13-9	13-10
14					14-4	14-5	14-6	14-7	14-8	14-9	14-10
15						15-5	15-6	15-7	15-8	15-9	15-10
16							16-6	16-7	16-8	16-9	16-10
17								17-7	17-8	17-9	17-10
18									18-8	18-9	18-10
19										19-9	19-10
20											20-10

Y1 facts
Y2 facts

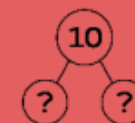
One More,
One Less



Two More, Two Less:
Think Odds and Evens



Number 10
Fact Families



Five and A Bit



Know About
Zero

0

Doubles and
Near Doubles



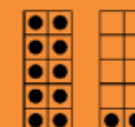
Number Neighbours:
Spot the Difference



7 Tree
9 Square



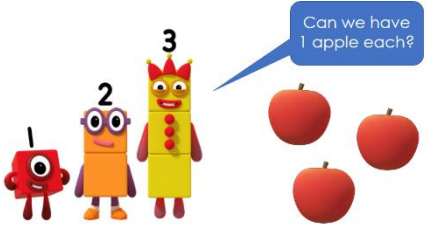
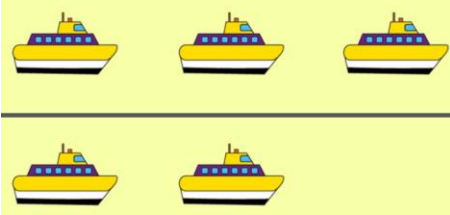
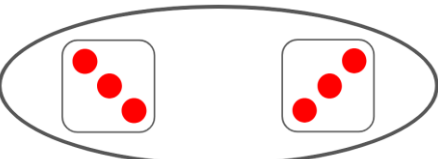
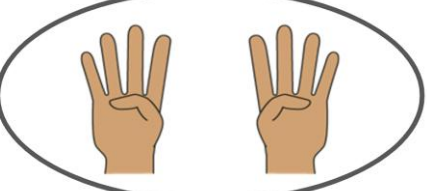
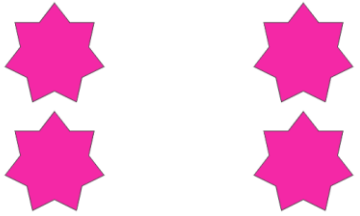
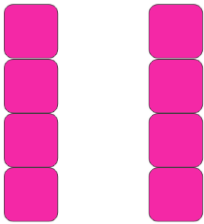
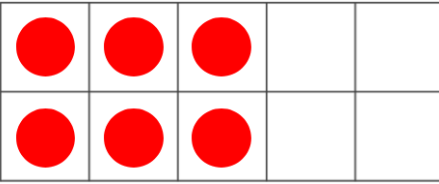
Ten and A Bit

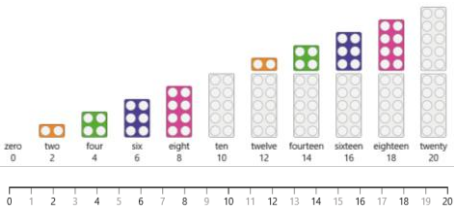
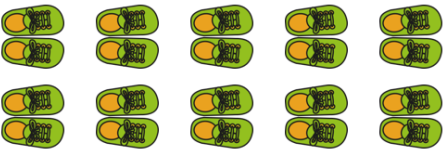
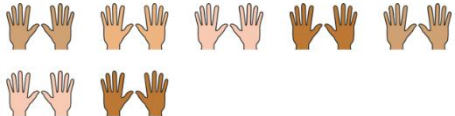
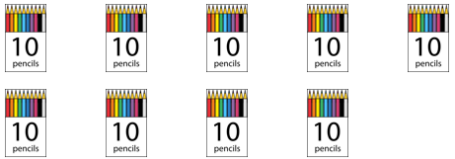
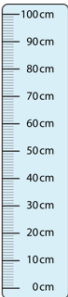
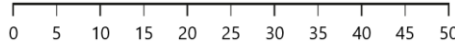
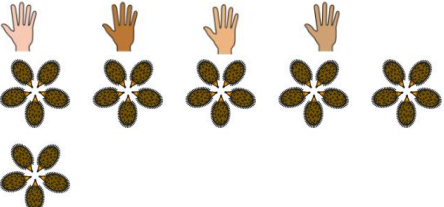


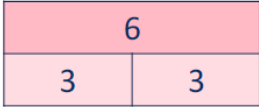
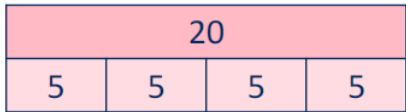
Make 10 and Then



MULTIPLICATION

RECEPTION			
Progression of skills	Representations		Vocabulary
Focus on equal and unequal groups when comparing numbers		 Equal or not equal?	double equal groups even fair groups odd pair unequal groups
Understand that two equal groups can be called a 'double' and connect this to finger patterns	This is a double because ____ is a part and ____ is a part. 	This is a double because ____ is a part and ____ is a part. 	
Sort odd and even numbers	 ____ is made of ____ and ____; ____ and ____ make ____.	 Even numbers CAN be made of 2 parts that are the same.	  Odd blocks and flat tops
Explore a range of representations of numbers, including the 10-frame, and see how doubles can be arranged in a 10-frame		Double 3 is 6. $3 + 3 = 6$	

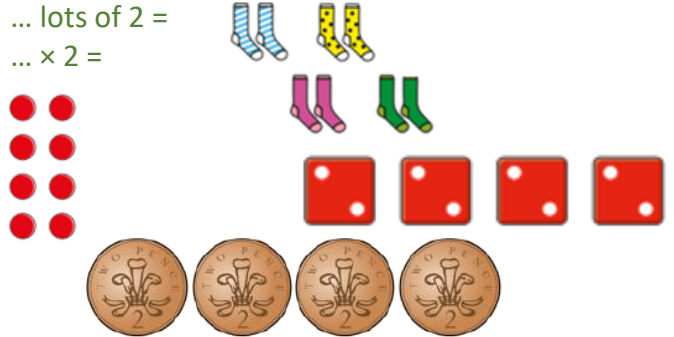
YEAR 1		Curriculum Prioritisation for Primary Maths		
Progression of skills	Representations			Vocabulary
Count efficiently in groups of 2		 How many shoes?	 Unitise How much money is there?	array repeated addition unitise multiple
Count efficiently in groups of 10	 		 Unitise	double equal groups even fair groups odd pair unequal groups
Count efficiently in groups of 5		 	  Unitise	

YEAR 2		White Rose Maths	
Progression of skills	Representations		Vocabulary
Link repeated addition and multiplication Encourage children to make the link between repeated addition and multiplication.	There are ... equal groups with ... in each group. There are ... altogether.   $3 + 3 = 6$ $2 \times 3 = 6$   $5 + 5 + 5 + 5 = 20$ $4 \times 5 = 20$		multiple repeated addition even lots of multiply odd twice times times table commutative inverse
Use arrays Encourage children to see that multiplication is commutative.	There are ... rows with ... in each row. There are ... columns with ... in each column.  $3 \text{ lots of } 5 = 15$ $5 + 5 + 5 = 15$ $5 \text{ lots of } 3 = 15$ $3 + 3 + 3 + 3 + 3 = 15$	I can see ... $\times$... and ... $\times$... $3 \times 5 = 15$ $5 \times 3 = 15$ $3 \times 5 = 5 \times 3$	array unitise double equal groups groups pair unequal groups
Double Encourage children to make links with related facts.	Double ... is ...   $\text{Double } 4 = 4 + 4$ $\text{Double } 4 \text{ is } 8$	Double ... is ... so double ... is ...   $\text{Double } 4 \text{ is } 8$ $\text{Double } 40 \text{ is } 80$	

The 2 times table

Encourage daily counting in multiples both forwards and back. Notice that all multiples of 2 are even numbers.

... lots of 2 =
... $\times 2 =$



?			
2	2	2	2

... times 2 is equal to ...

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

$$\begin{array}{ll} 1 \times 2 = 2 & 2 = 1 \times 2 \\ 2 \times 2 = 4 & 4 = 2 \times 2 \\ 3 \times 2 = 6 & 6 = 3 \times 2 \end{array}$$



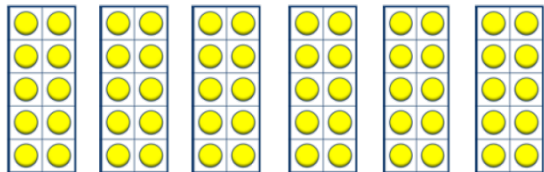
The 10 times table

Encourage daily counting in multiples both forwards and back. Notice the pattern in the numbers.

... lots of 10 =
... $\times 10 =$



?					
10	10	10	10	10	10



... times 10 is equal to ...

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

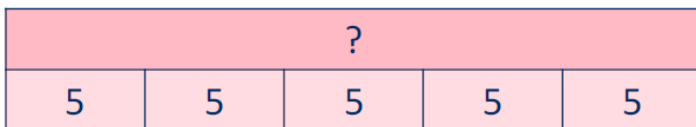
$$\begin{array}{ll} 1 \times 10 = 10 & 10 = 1 \times 10 \\ 2 \times 10 = 20 & 20 = 2 \times 10 \\ 3 \times 10 = 30 & 30 = 3 \times 10 \end{array}$$



The 5 times table

Encourage daily counting in multiples both forwards and back. Notice the pattern in the numbers.

... lots of =
... $\times 5 =$



... times 5 is equal to ...

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

$$\begin{array}{ll} 1 \times 5 = 5 & 5 = 1 \times 5 \\ 2 \times 5 = 10 & 10 = 2 \times 5 \\ 3 \times 5 = 15 & 15 = 3 \times 5 \end{array}$$

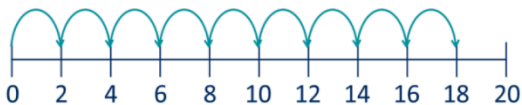


Algebra (Missing numbers)

Make links to known facts.

... is equal to ... groups of ...

18 socks, how many pairs?



... times ... is equal to ...

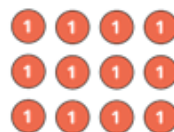
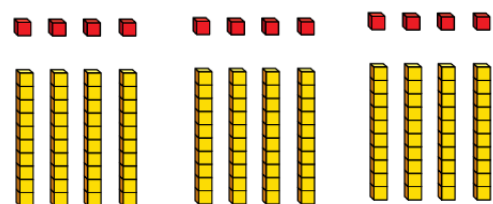
$$\begin{array}{l} \square \times 2 = 18 \\ 18 = 2 \times \square \end{array}$$

YEAR 3		White Rose Maths																															
Progression of skills	Representations		Vocabulary																														
The 3 times table Encourage daily counting in multiples both forwards and back.	... groups of = ... $\times 3 =$ 3, ... times = $3 \times \dots =$ 3 3 3 3		... times is equal to ... <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></table> $4 \times 3 = 12$ $12 = 4 \times 3$ </	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
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																								

Related facts

Use knowledge of multiplying by 10 to scale times table facts.

... $\times$... ones is equal to ... ones
so ... $\times$... tens is equal to ... tens.



$$3 \times 4 = 12$$
$$3 \times 40 = 120$$

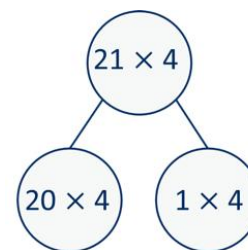
Multiply a 2-digit number by a 1-digit number - no exchange

Children apply their understanding of partitioning to represent and solve calculations using the expanded method.

... tens multiplied by ... is equal to ... tens.
...ones multiplied by ... is equal to ... ones.

Tens	Ones

$$30 \times 2 = 60$$
$$2 \times 2 = 4$$
$$32 \times 2 = 64$$



Tens	Ones

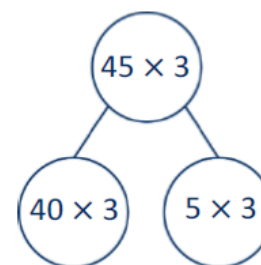
Multiply a 2-digit number by a 1-digit number - with exchange

Children apply their understanding of partitioning to represent and solve calculations using the expanded method.

... tens multiplied by ... is equal to ... tens.
... ones multiplied by ... is equal to ... ones.

Tens	Ones

$$20 \times 4 = 80$$
$$4 \times 4 = 16$$
$$24 \times 4 = 96$$

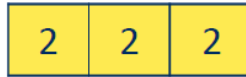
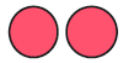


Tens	Ones

Scaling

Children focus on multiplication as scaling (... times the size) as opposed to repeated addition.

There are times as many ... as ...



There are 3 times as many triangles as circles.

... is ... times the size of ...

... is ... times the length/height of ...

 4 cm

 16 cm

Miss Smith is twice the height of Jo.



Correspondence problems (How many ways?)

Encourage children to work systematically to find all the different possible combinations.

For every ... , there are ... possible ...

There are ... $\times$... possibilities altogether.



hats	scarves
blue 	 
orange 	 
purple 	 

For every hat, there are two possible scarves.

$$3 \times 2 = 6$$

There are 6 possibilities altogether.

YEAR 4	White Rose Maths																																																																																																														
Progression of skills	Representations										Vocabulary																																																																																																				
Times table facts to 12 × 12 Encourage daily counting in multiples both forwards and back. Encourage children to notice links between related times tables.	... groups of ... = ... times ... is equal to × ... = <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><tr><td>51</td><td>52</td><td>53</td><td>54</td><td>55</td><td>56</td><td>57</td><td>58</td><td>59</td><td>60</td></tr><tr><td>61</td><td>62</td><td>63</td><td>64</td><td>65</td><td>66</td><td>67</td><td>68</td><td>69</td><td>70</td></tr><tr><td>71</td><td>72</td><td>73</td><td>74</td><td>75</td><td>76</td><td>77</td><td>78</td><td>79</td><td>80</td></tr><tr><td>81</td><td>82</td><td>83</td><td>84</td><td>85</td><td>86</td><td>87</td><td>88</td><td>89</td><td>90</td></tr><tr><td>91</td><td>92</td><td>93</td><td>94</td><td>95</td><td>96</td><td>97</td><td>98</td><td>99</td><td>100</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	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	factor factor pair inverse triple efficient commutative multiple product scaling
1	2	3	4	5	6	7	8	9	10																																																																																																						
11	12	13	14	15	16	17	18	19	20																																																																																																						
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81	82	83	84	85	86	87	88	89	90																																																																																																						
91	92	93	94	95	96	97	98	99	100																																																																																																						
Multiply by 1 and 0	Any number multiplied by 1 is equal to ... Any number multiplied by 0 is equal to × ... = ... 1 × 1 = 1 2 × 1 = 2 3 × 1 = 3 4 × 1 = 4 1 × 0 = 0 2 × 0 = 0 3 × 0 = 0 4 × 0 = 0										multiple repeated addition even lots of multiply twice times times table																																																																																																				
Multiply 3 numbers Children use their understanding of commutativity to multiply more efficiently.	To work out ... × ... × ..., I can first calculate ... × ... and then multiply the answer by ... 4 × 2 × 3 = 8 × 3 = 24 2 × 3 × 4 = 6 × 4 = 24 3 × 4 × 2 = 12 × 2 = 24										array unite double equal groups groups pair																																																																																																				

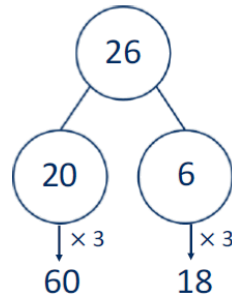
Factor pairs Children explore equivalent calculations using different factor pairs.	12 = ... × ... , so ... × 12 = ...× ... × ...	
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Mental strategies

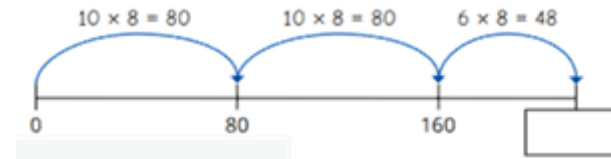
Partition 2 or 3-digit numbers to multiply using informal methods.

... tens multiplied by ... is equal to ... tens.
...ones multiplied by ... is equal to ... ones.

Tens	Ones



$$3 \times 26 = 60 + 18 = 78$$



$$26 \times 8 = 80 + 80 + 48 = 208$$

Multiply a 2 or 3-digit number by a 1-digit number

The short multiplication method is introduced for the first time, initially in an expanded form.

To multiply a 2-digit number by ... , I multiply the ones by ... and the tens by ...

To multiply a 3-digit number by ... , I multiply the ones by ... , the tens by ... and the hundreds by ...

T	O
10 10 10	1 1 1 1
10 10 10	1 1 1 1
10 10 10	1 1 1 1
10 10 10	1 1 1 1
10 10 10	1 1 1 1

	H	T	O
		3	4
x			5
		2	0
	1	5	0
	1	7	0

$$(4 \times 5) \\ (30 \times 5)$$

	H	T	O
		3	4
x			5
		1	7
	1	7	0

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

Scaling

Children focus on multiplication as scaling (... times the size).

... is ... times the size of ...

7

7	7	7	7	7	7
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A computer mouse costs £7
A keyboard costs 6 times as much.

6

6	6	6	6	6	6	6
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A red ribbon is 6 cm.
A yellow ribbon is 7 times as long.

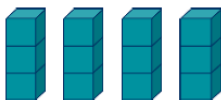
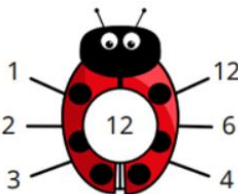
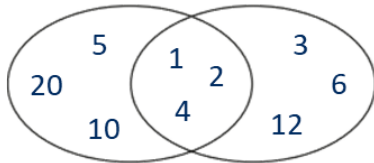
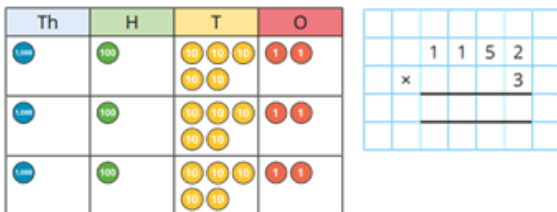
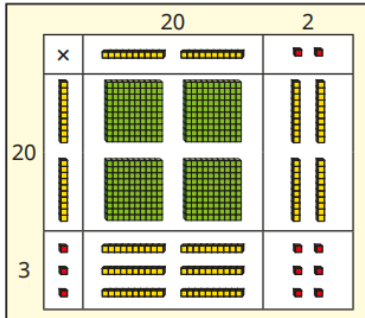
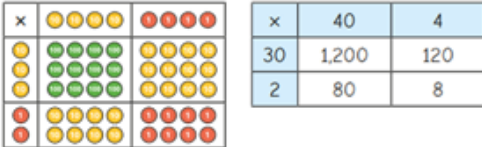
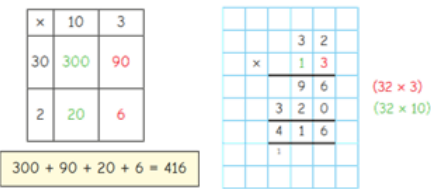
Correspondence problems

Encourage children to use tables to show all the different possible combinations.

For every ... , there are ... possibilities.
There are ... $\times$... possibilities altogether.
A pizza company offers a choice of 5 toppings and 3 bases.

$$5 \times 3 = 15$$

	Deep pan	Italian	Thin
Cheese	C DP	C I	C Th
Mushroom	M DP	M I	M Th
Vegetable	V DP	V I	V Th
Chicken	C DP	C I	C Th
Tuna	T DP	T I	T Th

YEAR 5		White Rose Maths																																
Progression of skills	Representations			Vocabulary																														
Multiples and factors Encourage children to notice patterns and make links with known facts.	... is a multiple of ... because ... $\times \dots = \dots$  <table border="1" data-bbox="374 414 799 541"><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></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	 ... is a factor of ... because $\dots \times \dots = \dots$  $1 \times 8 =$  $2 \times 4 =$ 1, 2, 4 and 8 are factors of 8	The common factors of ... and ... are ...  Factors of 20 Factors of 12	common multiple common factor cube number prime number square number
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																									
Square and cube numbers	... squared means $\dots \times \dots$  1×1 2×2 3×3 4×4 $1^2 = 1$ $2^2 = 4$ $3^2 = 9$ $4^2 = 16$	... cubed means $\dots \times \dots \times \dots$  $1 \times 1 \times 1$ $2 \times 2 \times 2$ $3 \times 3 \times 3$ $1^3 = 1$ $2^3 = 8$ $3^3 = 27$	factor factor pair inverse triple efficient																															
Multiply numbers up to 4 digits by a 1-digit number This builds on the short multiplication method introduced in Y4.	To multiply a 4-digit number by ... , I multiply the ones by ... , the by ... , the hundreds by ... and the thousands by ...  tens	commutative multiple product scaling																																
Multiply numbers up to 4 digits by a 2-digit number Numbers are first partitioned using an area model then long multiplication is introduced for the first time.	 $23 \times 22 = 400 + 60 + 40 + 6 = 506$	I can partition ... into ... and ...  $32 \times 44 = 1,200 + 80 + 120 + 8$ $32 \times 44 = 1,408$	First, I multiply by the Then I multiply by the ...  $300 + 90 + 20 + 6 = 416$	array unite double equal groups																														

Multiply by 10, 100 and 1,000

Some children may overgeneralise that multiplying by a power of 10 always results in adding zeros. This will cause issues later when multiplying decimals.

To multiply by 10/100/1,000, I move all the digits ... places to the left.
... is 10/100/1,000 times the size of ...

M	HTh	TTh	Th	H	T	O
				● ●	● ●	● ●

$$234 \times 10 = 2,340$$

$$234 \times 100 = 23,400$$

$$234 \times 1,000 = 234,000$$

Th	H	T	O	●	Tth	Hth
			● ●	●	● ●	● ●

$$2.34 \times 10 = 23.4$$

$$2.34 \times 100 = 234$$

$$2.34 \times 1,000 = 2,340$$

Mental strategies

Children continue to use efficient mental strategies such as partitioning and knowledge of factor pairs and related facts to multiply.

The most efficient strategy to calculate ... $\times$... is ...
To calculate ... $\times$ 12, I can do ... $\times$... $\times$...

For example: 121×12
I could calculate 100×12 plus 20×12 plus 1×12
I could calculate 121×10 plus 121×2
I could calculate $121 \times 6 \times 2$
I could calculate $121 \times 4 \times 3$

YEAR 6	White Rose Maths																																																																																	
Progression of skills	Representations	Vocabulary																																																																																
Multiply numbers up to 4 digits by a 2-digit number	To multiply by a 2-digit number, first multiply by the ones, then multiply by the tens and then find the total. <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>1</td><td>2</td><td>0</td><td>7</td><td></td></tr><tr><td></td><td>×</td><td></td><td></td><td></td><td>3</td><td>6</td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>+</td><td></td><td>7</td><td>2</td><td>4</td><td>2</td><td></td><td>(1,207 × 6)</td></tr><tr><td></td><td>3</td><td>6</td><td>2</td><td>1</td><td>0</td><td></td><td>(1,207 × 30)</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td>4</td><td>3</td><td>4</td><td>5</td><td>2</td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												1	2	0	7			×				3	6										+		7	2	4	2		(1,207 × 6)		3	6	2	1	0		(1,207 × 30)										4	3	4	5	2												1							composite number order of operations powers of
			1	2	0	7																																																																												
	×				3	6																																																																												
+		7	2	4	2		(1,207 × 6)																																																																											
	3	6	2	1	0		(1,207 × 30)																																																																											
	4	3	4	5	2																																																																													
	1																																																																																	
Multiply by 10, 100 and 1,000 Some children may over-generalise that multiplying by a power of 10 always results in adding zeros.	To multiply by 10/100/1,000, I move all the digits ... places to the left. ... is 10/100/1,000 times the size of ... <table><tr><td>M</td><td>HTh</td><td>TTh</td><td>Th</td><td>H</td><td>T</td><td>O</td></tr><tr><td></td><td></td><td></td><td></td><td>●●</td><td>●●</td><td>●●●</td></tr></table> 234 × 10 = 2,340 234 × 100 = 23,400 234 × 1,000 = 234,000 <table><tr><td>Th</td><td>H</td><td>T</td><td>O</td><td>●</td><td>Tth</td><td>Hth</td><td>Thth</td></tr><tr><td></td><td></td><td></td><td></td><td>●●</td><td>●●</td><td>●●●</td><td>●●●</td></tr></table> 0.234 × 10 = 2.34 0.234 × 100 = 23.4 0.234 × 1,000 = 234	M	HTh	TTh	Th	H	T	O					●●	●●	●●●	Th	H	T	O	●	Tth	Hth	Thth					●●	●●	●●●	●●●	common multiple common factor cube number prime number square number																																																		
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Th	H	T	O	●	Tth	Hth	Thth																																																																											
				●●	●●	●●●	●●●																																																																											
Order of operations Calculations in brackets should be done first. Multiplication and division should be performed before addition and subtraction.	... has greater priority than ..., so the first part of the calculation I need to do is ... <table><tr><td> () powers × and ÷ + and - ●●●●●●●● ●●●●●●●● (3 + 4) × 2 = 14 ●●●●●●●● ●●●●●●●● 3 + 4² = 19 ●●●●●●●● ●●●●●●●● 3 + 4 × 2 = 11 </td></tr></table>	() powers × and ÷ + and - ●●●●●●●● ●●●●●●●● (3 + 4) × 2 = 14 ●●●●●●●● ●●●●●●●● 3 + 4² = 19 ●●●●●●●● ●●●●●●●● 3 + 4 × 2 = 11	factor factor pair inverse triple efficient																																																																															
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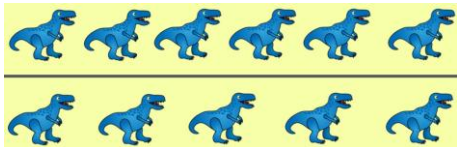
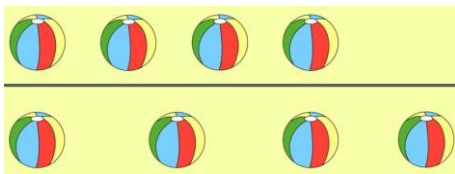
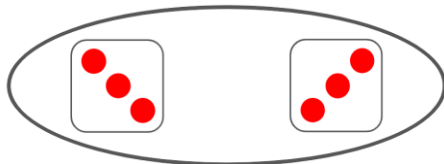
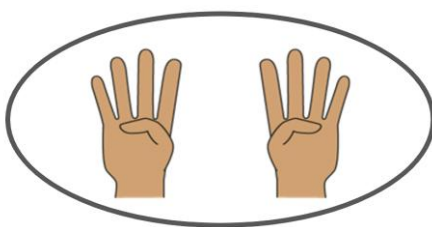
MULTIPLICATION FACTS (Number Sense Maths, Times Table Fluency)

$2 \times 2 = 4$							
$3 \times 2 = 6$	$3 \times 3 = 9$						
$4 \times 2 = 8$	$4 \times 3 = 12$	$4 \times 4 = 16$					
$5 \times 2 = 10$	$5 \times 3 = 15$	$5 \times 4 = 20$	$5 \times 5 = 25$				
$6 \times 2 = 12$	$6 \times 3 = 18$	$6 \times 4 = 24$	$6 \times 5 = 30$	$6 \times 6 = 36$			
$7 \times 2 = 14$	$7 \times 3 = 21$	$7 \times 4 = 28$	$7 \times 5 = 35$	$7 \times 6 = 42$	$7 \times 7 = 49$		
$8 \times 2 = 16$	$8 \times 3 = 24$	$8 \times 4 = 32$	$8 \times 5 = 40$	$8 \times 6 = 48$	$8 \times 7 = 56$	$8 \times 8 = 64$	
$9 \times 2 = 18$	$9 \times 3 = 27$	$9 \times 4 = 36$	$9 \times 5 = 45$	$9 \times 6 = 54$	$9 \times 7 = 63$	$9 \times 8 = 72$	$9 \times 9 = 81$

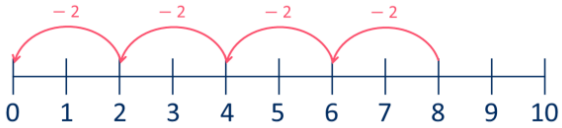
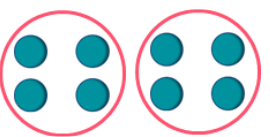
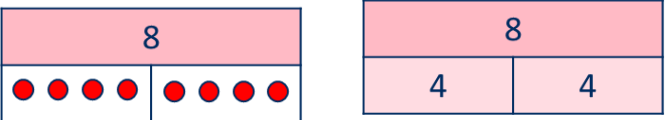
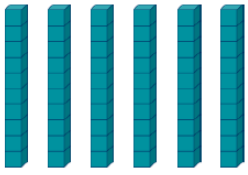
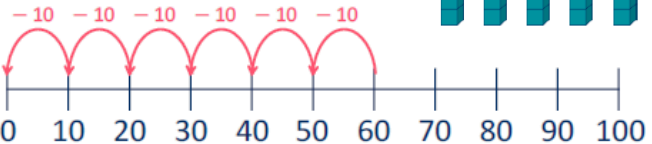
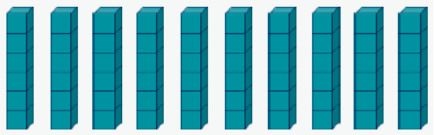
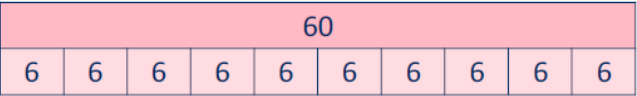
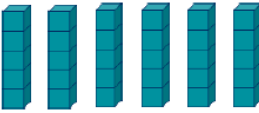
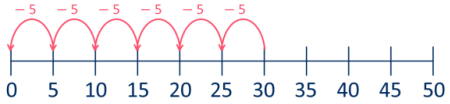
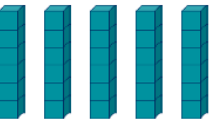
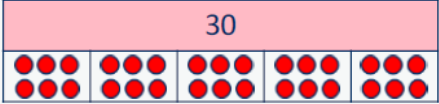
Year 3

Year 4

DIVISION

RECEPTION			
Progression of skills	Representations		Vocabulary
Focus on equal and unequal groups when comparing numbers	 Equal or not equal?	 Equal or not equal?	equal groups even fair grouping groups sharing unequal groups
Understand that 2 equal groups make a double. Identify both parts of the double.	 _____ is made of _____ and _____; _____ and _____ make _____.	 _____ is made of _____ and _____; _____ and _____ make _____.	

YEAR 1		
Curriculum Prioritisation for Primary Maths		
Progression of skills	Representations	Vocabulary
Count in multiples of 2	How many 2p coins do you need to buy a 10p rubber? 	array divide equal groups even fair grouping groups sharing unequal groups
Count in multiples of 10	How many 10p coins do you need to buy a 30p boat? 	
Count in multiples of 5	How many 5p coins do you need to buy a 30p boat? 	

YEAR 2	White Rose Maths		
Progression of skills	Representations		Vocabulary
Divide by 2 Encourage children to compare the grouping and sharing structures of division and to make links with times table facts and halving.	There are ... equal groups of 2 $\dots \div 2 = \dots$  $4 \times 2 = 8$ $8 \div 2 = 4$  	... shared equally between 2 is ... Half of ... is ... $\dots \div 2 = \dots$  $4 \times 2 = 8$ $8 \div 2 = 4$  	multiple repeated subtraction divide grouping sharing even half lots of odd times times table array equal groups fair groups unequal groups
Divide by 10 Encourage children to compare the grouping and sharing structures of division and to make links with times table facts.	There are ... equal groups of 10 $\dots \div 10 = \dots$ $6 \times 10 = 60$ $60 \div 10 = 6$  	... shared equally between 10 is ... $\dots \div 10 = \dots$ $6 \times 10 = 60$ $60 \div 10 = 6$  	
Divide by 5 Encourage children to compare the grouping and sharing structures of division and to make links with times table facts.	There are ... equal groups of $\dots \div 5 = \dots$  $6 \times 5 = 30$ $30 \div 5 = 6$  	... shared equally between is ... $\dots \div 5 = \dots$  $6 \times 5 = 30$ $30 \div 5 = 6$  	

Algebra

Bar models are useful to show the link between multiplication and division.

... divided by 2/5/10 is equal to ...

?	
10	10

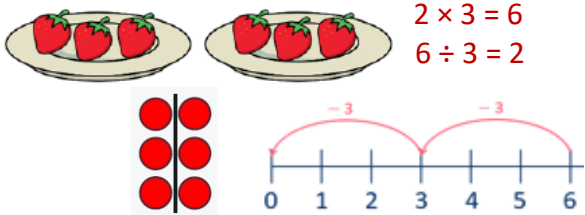
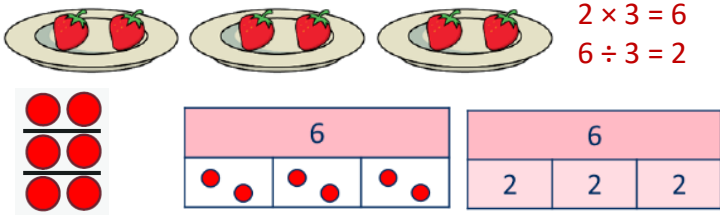
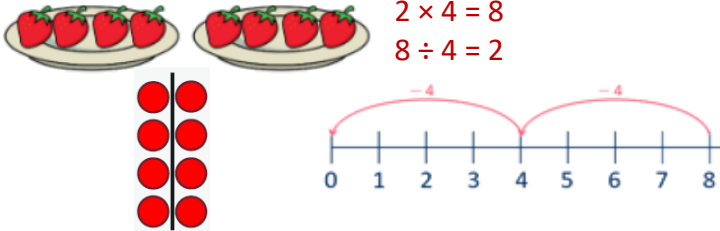
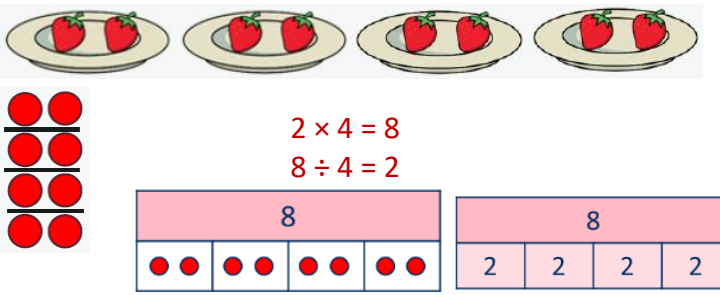
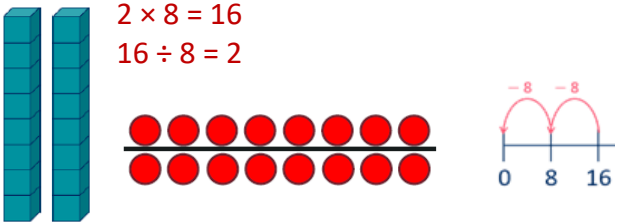
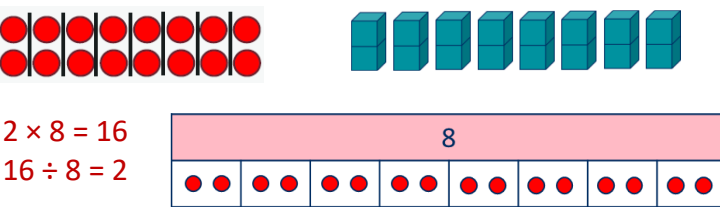
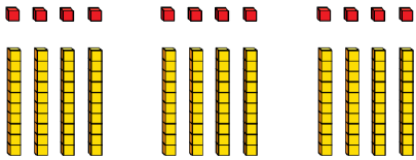
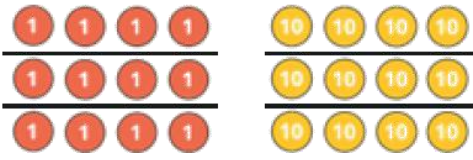
$$\square \div 2 = 10$$

?				
10	10	10	10	10

$$\square \div 5 = 10$$

?									
10	10	10	10	10	10	10	10	10	10

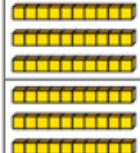
$$\square \div 10 = 10$$

YEAR 3		White Rose Maths	
Progression of skills	Representations		Vocabulary
Divide by 3 Encourage children to compare the grouping and sharing structures of division and to make links with times table facts.	There are ... groups of in ... $\dots \div 3 =$  $2 \times 3 = 6$ $6 \div 3 = 2$	... has been shared equally into equal groups. $\dots \div 3 =$  $2 \times 3 = 6$ $6 \div 3 = 2$	grouping sharing inverse multiple product remainder scaling
Divide by 4 Encourage children to compare the grouping and sharing structures of division and to make links with times table facts.	There are ... groups of in ... $\dots \div 4 =$  $2 \times 4 = 8$ $8 \div 4 = 2$	... has been shared equally into equal groups. $\dots \div 4 =$  $2 \times 4 = 8$ $8 \div 4 = 2$	multiple repeated subtraction divide even half lots of odd times table
Divide by 8 Encourage children to compare the grouping and sharing structures of division and to make links with times table facts.	There are ... groups of in ... $\dots \div 8 =$  $2 \times 8 = 16$ $16 \div 8 = 2$	... has been shared equally into equal groups. $\dots \div 8 =$  $2 \times 8 = 16$ $16 \div 8 = 2$	array equal groups fair groups unequal groups
Related facts Link to known times table facts.	$\dots \div \dots$ is equal to ..., so ... tens $\div$... is equal to ... tens. $12 \div 3 = 4$ $120 \div 3 = 40$  		

Divide a 2-digit number by a 1-digit number - no exchange

Partition into tens and ones to divide and then recombine.

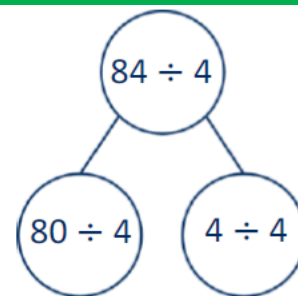
... tens divided by ... is equal to ... tens.
... ones divided by ... is equal to ... ones.

Tens	Ones
	

$$60 \div 2 = 30$$

$$4 \div 2 = 2$$

$$64 \div 2 = 32$$



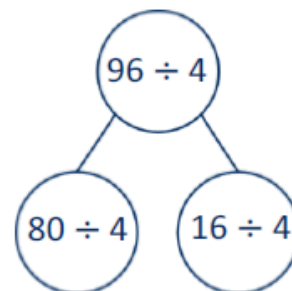
Tens	Ones
	
	
	
	

Divide a 2-digit number by a 1-digit number – with remainders

Encourage children to partition numbers flexibly to help them to divide more efficiently.

... tens divided by ... is equal to ... tens.
... ones divided by ... is equal to ... ones.

Tens	Ones
	
	
	
	



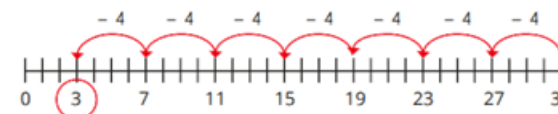
$$80 \div 4 = 20$$

$$16 \div 4 = 4$$

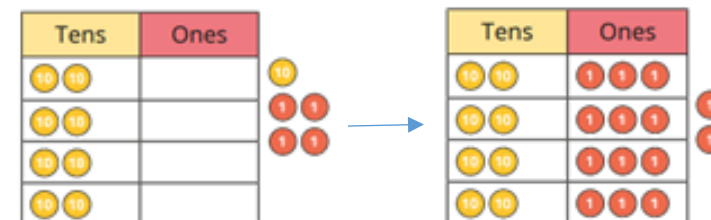
$$96 \div 4 = 24$$

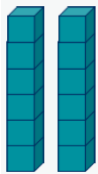
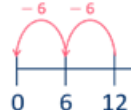
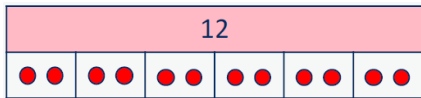
There are ... groups of ...
There are ... remaining.

$$31 \div 4 = 7 \text{ r}3$$



$$94 \div 4 = 23 \text{ r}2$$

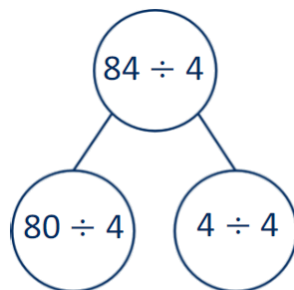


YEAR 4	White Rose Maths		
Progression of skills	Representations		Vocabulary
Division facts to 12 × 12 Encourage children to compare the grouping and sharing structures of division and to make links with times table facts.	There are ... groups of ... in ÷ ... =   $2 \times 6 = 12$ $12 \div 6 = 2$ 	... has been shared equally into ... equal groups. ... ÷ ... =    $2 \times 6 = 12$ $12 \div 6 = 2$	grouping sharing factor factor pair inverse triple efficient
Divide a number by 1 and itself Children may try to divide a number by zero and it should be highlighted that this is not possible.	When I divide a number by 1, the number remains the same. 5 shared between 1 is 5  There are 5 groups of 1 in 5 	When I divide a number by itself, the answer is 1 5 shared between 5 is 1  There is 1 group of 5 in 5 	multiple product remainder scaling multiple repeated subtraction divide even half lots of odd times times table array equal groups
Related facts Link to known times table facts.	... ÷ ... is equal to ... so ... tens ÷ ... is equal to ... tens and ... hundreds ÷ ... is equal to ... hundreds.    $21 \div 7 = 3$ $210 \div 7 = 30$ $2,100 \div 7 = 300$ $21 \div 3 = 7$ $210 \div 3 = 70$ $2,100 \div 3 = 700$		

Divide a 2 or 3-digit number by a 1-digit number

Progress from divisions with no exchange, to divisions with exchange and then divisions with remainders.

I can partition ... into ... tens and ... ones.



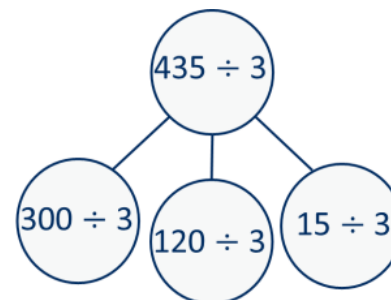
$$80 \div 4 = 20$$

$$4 \div 4 = 1$$

$$84 \div 4 = 21$$

Tens	Ones
10 10	1
10 10	1
10 10	1
10 10	1

I cannot share the hundreds/tens equally, so I need to exchange 1 ... for 10 ...



$$300 \div 3 = 100$$

$$120 \div 3 = 40$$

$$15 \div 3 = 5$$

$$435 \div 3 = 145$$

Hundreds	Tens	Ones
100	10 10 10 10	1 1 1 1 1
100	10 10 10 10	1 1 1 1 1
100	10 10 10 10	1 1 1 1 1
100	10 10 10 10	1 1 1 1 1

Divide by 10 and 100

Encourage children to notice that dividing by 100 is the same as dividing by 10 twice.

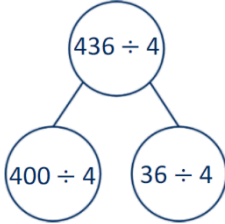
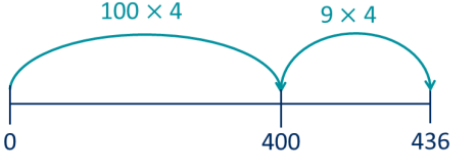
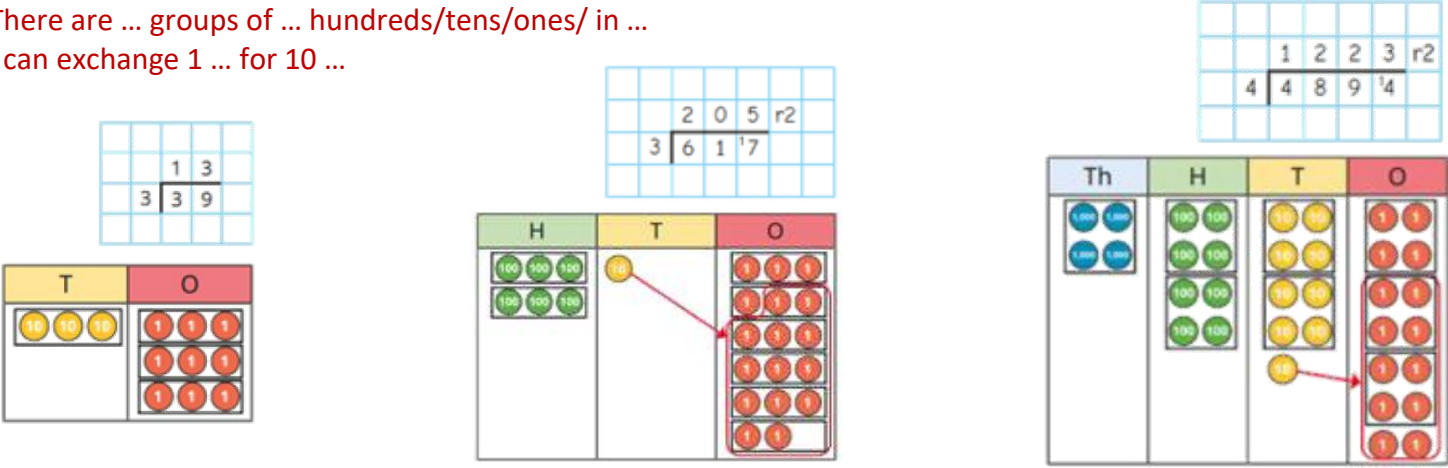
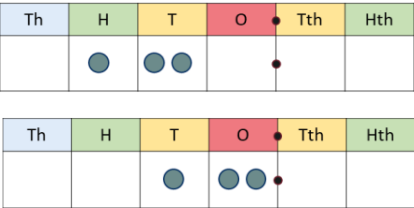
When I divide by 10, the digits move 1 place value column to the right.
... is one-tenth the size of ...

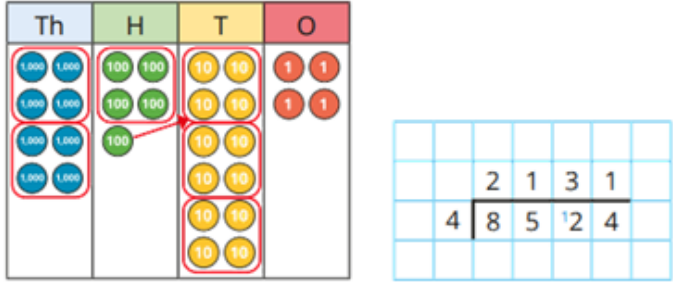
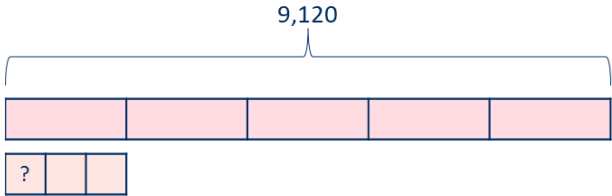
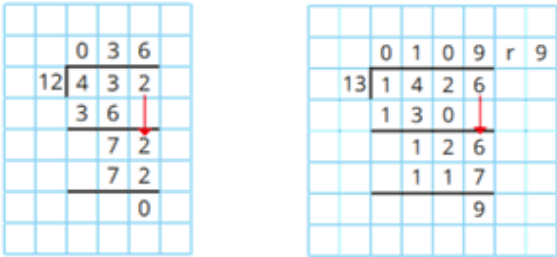
$$3,600 \div 10 = 360$$

$$360 \div 10 = 36$$

When I divide by 100, the digits move 2 place value columns to the right.
... is one-hundredth the size of ...

$$3,600 \div 100 = 36$$

YEAR 5		White Rose Maths		
Progression of skills	Representations			Vocabulary
Mental strategies 	I can partition ... into ... and ... to help me to divide more easily. 	I can show groups of ... on a number line. 	To divide by ..., I can divide by ... and then divide the result by ... $436 \div 4 = 436 \div 2 \div 2$ $436 \div 2 = 218$ $218 \div 2 = 109$	grouping sharing common multiple common factor
Divide numbers up to 4 digits by a 1-digit number The short division method is introduced for the first time.	There are ... groups of ... hundreds/tens/ones/ in ... I can exchange 1 ... for 10 ... 			factor pair inverse triple efficient multiple product remainder scaling multiple repeated subtraction divide even half lots of odd times times table array equal groups
Divide by 10, 100 and 1,000 Encourage children to notice that dividing by 100 is the same as dividing by 10 twice, and that dividing by 1,000 is the same as dividing by 10 three times.	To divide by 10/100/1,000, I move all the digits ... places to the right. ... is one-tenth/one-hundredth/one-thousandth the size of ...  $120 \div 10 = 12$			

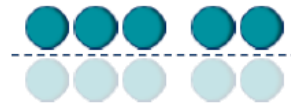
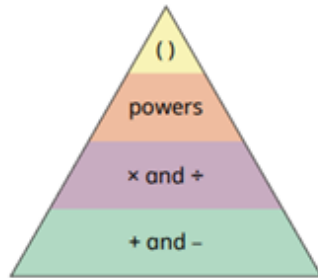
YEAR 6	White Rose Maths	
Progression of skills	Representations	Vocabulary
Short division Encourage children to interpret remainders in context, for example knowing that “remainder 1” could mean complete boxes with 1 left over so 5 boxes will be needed.	There are ... groups of ... hundreds/tens/ones/ in ... I can exchange 1 ... for 10 ... 	grouping sharing composite number order of operations powers of symbol – divide (link to fractions)
Mental strategies Include partitioning and number line strategies outlined in Y5 as well as division using factors.	To divide by ... , I can first divide by ... and then divide the answer by ... $240 \div 60 = 240 \div 10 \div 6$  $480 \div 24 = 480 \div 4 \div 6$  $9,120 \div 15 = 9,120 \div 5 \div 3$ 	common multiple common factor factor pair inverse triple efficient
Long division The long division method is introduced for the first time. Two alternative methods are shown.		multiple product remainder scaling multiple repeated subtraction divide half array

Order of operations

Calculations in brackets should be done first, then powers.

Multiplication and division should be performed before addition and subtraction.

... has greater priority than ..., so the first part of the calculation I need to do is ...



$$(6 + 4) \div 2 = 5$$



$$6 + 4 \div 2 = 8$$

DIVISION FACTS (Number Sense Maths, Times Table Fluency)

$4 \div 2 = 2$							
$6 \div 2 = 3$	$9 \div 3 = 3$						
$8 \div 2 = 4$	$12 \div 3 = 4$	$16 \div 4 = 4$					
$10 \div 2 = 5$	$15 \div 5 = 3$	$20 \div 5 = 4$	$25 \div 5 = 5$				
$12 \div 2 = 6$	$18 \div 3 = 6$	$24 \div 4 = 6$	$30 \div 5 = 6$	$36 \div 6 = 6$			
$14 \div 2 = 7$	$21 \div 3 = 7$	$28 \div 4 = 7$	$35 \div 5 = 7$	$42 \div 6 = 7$	$49 \div 7 = 7$		
$16 \div 2 = 8$	$24 \div 3 = 8$	$32 \div 4 = 8$	$40 \div 5 = 8$	$48 \div 6 = 8$	$56 \div 7 = 8$	$64 \div 8 = 8$	
$18 \div 2 = 9$	$27 \div 3 = 9$	$36 \div 4 = 9$	$45 \div 5 = 9$	$54 \div 6 = 9$	$63 \div 7 = 9$	$72 \div 8 = 9$	$81 \div 9 = 9$

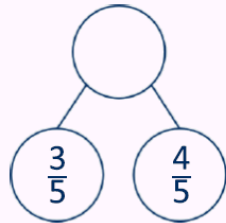
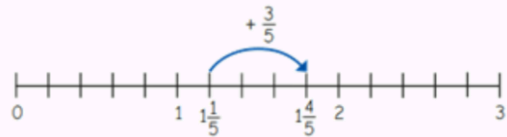
Year 3

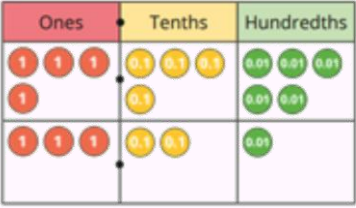
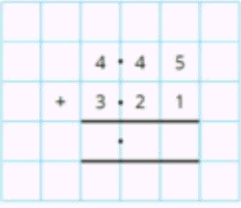
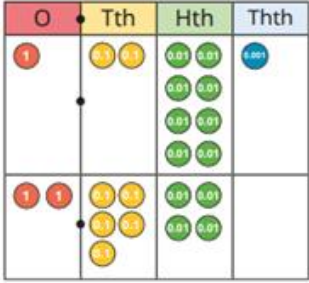
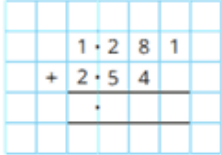
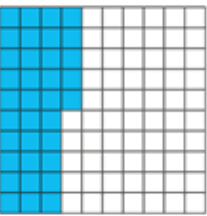
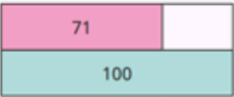
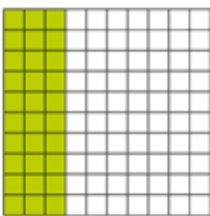
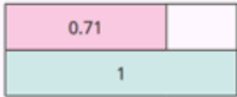
Year 4

Fractions, decimals and percentages

ADDITION

YEAR 3		
Progression of skills	Representations	Vocabulary
Add fractions with the same denominator within 1 whole Make links with known facts.	When adding fractions with the same denominator, I only add the numerator. ... fifths + ... fifths = ... fifths $\frac{1}{5} + \frac{1}{5} = \frac{2}{5}$  $\frac{1}{5} + \frac{2}{5} = \frac{3}{5}$  $\frac{1}{5} + \frac{3}{5} = \frac{4}{5}$ 	inverse algebra

YEAR 4			
Progression of skills	Representations	Vocabulary	
Add decimal numbers in the context of money Emphasis on partitioning and use of number lines rather than formal written calculations.	... pence + ... pence = ... pence ... pounds + ... pounds = ... pounds  45p + 25p = 70p £2 + £3 = £5 £5 + 70p = £5.70	£3.25 can be partitioned into £3 + 20p + 5p 	efficient inverse algebra
Add fractions and mixed numbers with the same denominator beyond 1 whole	When adding fractions with the same denominator, I only add the numerator. ... fifths + ... fifths = ... fifths $\frac{3}{5} + \frac{4}{5} = \frac{7}{5} = 1\frac{2}{5}$    		

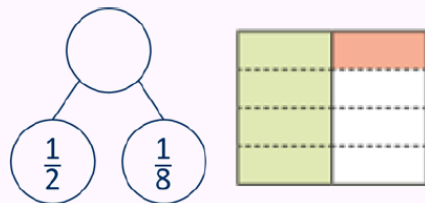
YEAR 5	White Rose Maths	
Progression of skills	Representations	Vocabulary
Add decimals with up to 2 decimal places Progress from the same number of decimal places to a different number of decimal places, and from no exchange to exchange.	I do/do not need to make an exchange because ... I can exchange 10 ... for 1 ...    	accurate approximate strategy algebra
Complements to 1 Pairs of numbers with up to 3 decimal places which total 1 Encourage children to make links with bonds to 10 and complements to 100 and 1,000	$0.35 + \square = 1$   $0.3 + \square = 1$    $4 + 6 = 10$ $44 + 56 = 100$ $444 + 556 = 1,000$ $0.4 + 0.6 = 1$ $0.44 + 0.56 = 1$ $0.444 + 0.556 = 1$	

Add fractions with denominators that are a multiple of one another

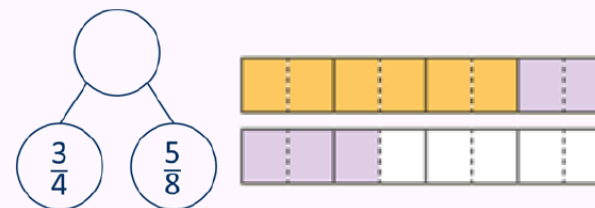
Encourage children to convert fractions to the same denominator before adding.
Progress from adding fractions within 1 whole to adding fractions beyond 1 whole.

The denominator has been multiplied by ... , so the numerator needs to be multiplied by... for the fractions to be equivalent.

$$\frac{1}{2} + \frac{1}{8} = \frac{4}{8} + \frac{1}{8} = \frac{5}{8}$$



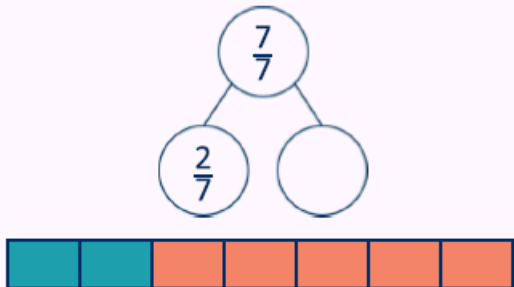
$$\frac{1}{4} + \frac{3}{8} = \frac{2}{8} + \frac{3}{8} = \frac{5}{8}$$

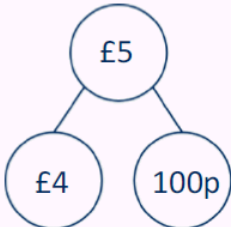
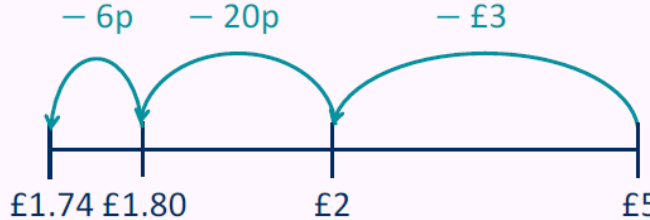
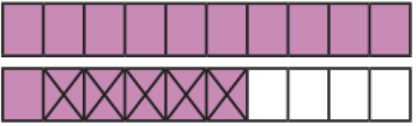
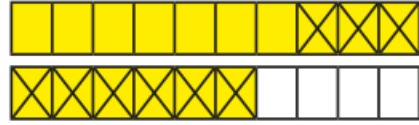
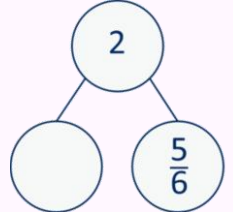
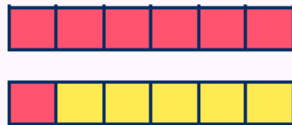
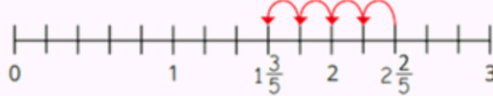
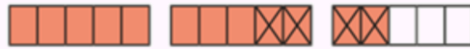


$$\frac{3}{4} + \frac{5}{8} = \frac{6}{8} + \frac{5}{8} = \frac{11}{8} = 1\frac{3}{8}$$

YEAR 6	White Rose Maths																																																																																		
Progression of skills	Representations		Vocabulary																																																																																
Add decimals with up to 3 decimal places Progress to numbers with digits in different place value columns. Encourage children to check that they have lined up the columns correctly.	I do/do not need to make an exchange because ... <table><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td>3</td><td>1</td><td>0</td><td>8</td></tr><tr><td></td><td>+</td><td>2</td><td>1</td><td>5</td><td>4</td></tr><tr><td></td><td></td><td>5</td><td>2</td><td>6</td><td>2</td></tr><tr><td></td><td></td><td></td><td></td><td>1</td><td></td></tr></table> <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>1</td><td>5</td><td>0</td><td>2</td><td>7</td><td></td><td></td></tr><tr><td></td><td>+</td><td></td><td>9</td><td>5</td><td>8</td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td>2</td><td>4</td><td>6</td><td>0</td><td>7</td><td></td><td></td><td></td></tr><tr><td></td><td></td><td>1</td><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td></tr></table>										3	1	0	8		+	2	1	5	4			5	2	6	2					1															1	5	0	2	7				+		9	5	8							2	4	6	0	7						1		1						order of operations
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Add fractions Convert fractions to the same denominator before adding. Progress from fractions where one denominator is a multiple of the other, to any fractions and then to mixed numbers.	The denominator has been multiplied by ... , so the numerator needs to be multiplied by ... <table><tr><td></td><td></td></tr><tr><td>$\frac{1}{3}$</td><td>$\frac{5}{12}$</td></tr></table><table><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>			$\frac{1}{3}$	$\frac{5}{12}$																			The lowest common multiple of ... and ... is ... <table><tr><td></td><td></td></tr><tr><td>$\frac{1}{3}$</td><td>$\frac{1}{4}$</td></tr></table><table><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>$\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$			$\frac{1}{3}$	$\frac{1}{4}$																			...is made up of ... wholes and ... <table><tr><td></td><td></td></tr><tr><td>$2\frac{2}{3}$</td><td>$1\frac{1}{6}$</td></tr></table><table><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>			$2\frac{2}{3}$	$1\frac{1}{6}$																																
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SUBTRACTION

YEAR 3	White Rose Maths	
Progression of skills	Representations	Vocabulary
Subtract fractions with the same denominator within 1 whole Make links with known facts.	When subtracting fractions with the same denominator, I only subtract the numerator. ... fifths – ... fifths = ... fifths $\frac{5}{5} - \frac{1}{5} = \frac{4}{5}$  $\frac{4}{5} - \frac{1}{5} = \frac{3}{5}$  $\frac{3}{5} - \frac{1}{5} = \frac{2}{5}$  	estimate exchange inverse algebra

YEAR 4	White Rose Maths		
Progression of skills	Representations		Vocabulary
Subtract decimal numbers in the context of money Emphasis here is on partitioning and use of number lines rather than formal written calculations.	I can partition £... into £... and 100p £... – £... = £... 100p – ...p = ...p  $£5 - £3.26$ $£4 - £3 = £1$ $100p - 26p = 74p$ $£5 - £3.26 = £1.74$	$£3.26$ can be partitioned into $£3 + 20p + 6p$ 	efficient inverse algebra
Subtract fractions and mixed numbers with the same denominator Include subtracting fractions from wholes.	When subtracting fractions with the same denominator, I only subtract the numerator. ... tenths – ... tenths = ... tenths  $\frac{16}{10} - \frac{5}{10} =$  $\frac{16}{10} - \frac{9}{10} =$    		

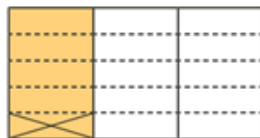
YEAR 5	White Rose Maths	
Progression of skills	Representations	Vocabulary
Subtract decimals with up to 2 decimal places Progress from the same number of decimal places to a different number of decimal places and from no exchange to exchange.	Ones Tenths Hundredths 1 1 0.1 0.1 0.1 0.1 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 2 3 1 2 - 1 1 7 1 2 5 24.4 3.12 ? 2 4 4 - 3 1 2 .	accurate approximate constant difference strategy algebra
Complements to 1 Encourage children to make links with bonds to 10 and complements to 100 and 1,000 when finding a missing part or subtracting from 1	0.3 + = 1	

Subtract fractions with denominators that are a multiple of one another

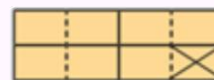
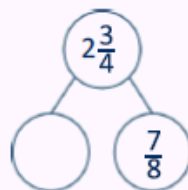
Convert fractions to the same denominator before subtracting. Progress from subtracting fractions within 1 whole to subtracting from a mixed number.

The denominator has been multiplied by ... , so the numerator needs to be multiplied by... for the fractions to be equivalent.

$$\frac{1}{3} - \frac{1}{15} = \frac{5}{15} - \frac{1}{15} = \frac{4}{15}$$

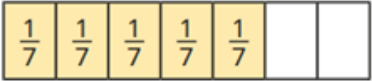
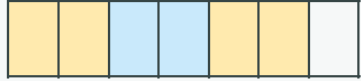
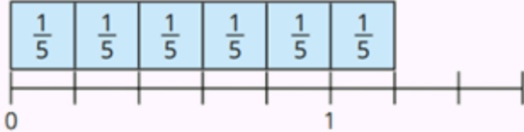
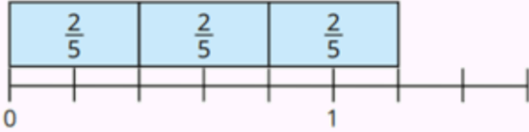
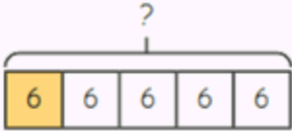
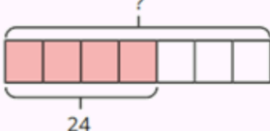


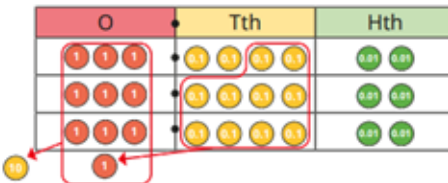
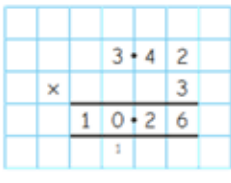
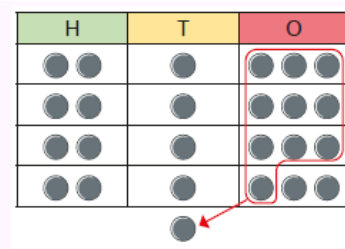
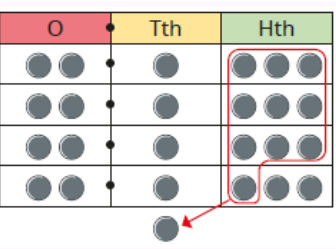
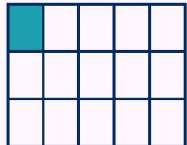
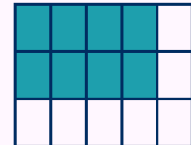
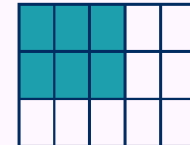
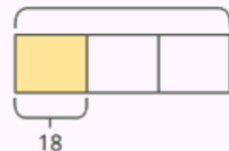
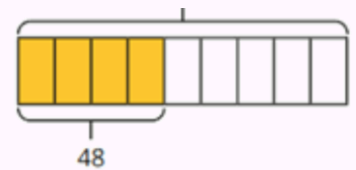
$$\frac{2}{3} - \frac{1}{3} = \frac{6}{9} - \frac{3}{9} = \frac{3}{9}$$



YEAR 6	White Rose Maths																																																												
Progression of skills	Representations		Vocabulary																																																										
Subtract decimals with up to 3 decimal places Progress from the same number of decimal and whole number places to a different number of decimal and whole number places.	I do/do not need to make an exchange because ... <table><tr><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td>6</td><td>7</td><td>13</td></tr><tr><td></td><td>-</td><td>1</td><td>3</td><td>4</td></tr><tr><td></td><td></td><td>5</td><td>3</td><td>9</td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr></table> <table><tr><td>O</td><td>Tth</td><td>Hth</td><td>Thth</td></tr><tr><td>0</td><td>9</td><td>7</td><td>5</td></tr></table> <table><tr><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td>1</td><td>5</td><td>11</td></tr><tr><td></td><td>-</td><td>0</td><td>6</td><td>4</td></tr><tr><td></td><td></td><td>0</td><td>9</td><td>7</td></tr><tr><td></td><td></td><td></td><td></td><td>5</td></tr></table>									6	7	13		-	1	3	4			5	3	9						O	Tth	Hth	Thth	0	9	7	5								1	5	11		-	0	6	4			0	9	7					5	order of operations
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		0	9	7																																																									
				5																																																									
Subtract fractions Convert fractions to the same denominator before subtracting. Progress from fractions where one denominator is a multiple of the other, to any fractions and then subtracting from a mixed number.	The denominator has been multiplied by ... , so the numerator needs to be multiplied by... <table><tr><td>2/3</td><td></td><td>1/9</td></tr></table> <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>$\frac{2}{3} - \frac{1}{9} = \frac{6}{9} - \frac{1}{9} = \frac{5}{9}$	2/3		1/9																	The lowest common multiple of ... and ... is ... <table><tr><td>7/9</td><td></td><td>1/2</td></tr></table>$\frac{7}{9} - \frac{1}{2} = \frac{14}{18} - \frac{9}{18} = \frac{5}{18}$	7/9		1/2	... is made up of ... wholes and ... <table><tr><td>2 3/4</td><td></td><td>1 1/8</td></tr></table> <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>$1\frac{3}{4} - 1\frac{1}{8} = 1\frac{5}{8}$	2 3/4		1 1/8																																	
2/3		1/9																																																											
7/9		1/2																																																											
2 3/4		1 1/8																																																											

MULTIPLICATION

YEAR 5	White Rose Maths	
Progression of skills	Representations	Vocabulary
Multiply fractions by a whole number Make links with repeated addition. E.g. $\frac{1}{5} \times 4 = \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5}$	To multiply a fraction by an integer, I multiply the numerator by the integer and the denominator remains the same.  $\frac{1}{7} \times 5 = \frac{1}{7} + \frac{1}{7} + \frac{1}{7} + \frac{1}{7} + \frac{1}{7} = \frac{5}{7}$  $\frac{2}{5} \times 3 = \frac{2}{5} + \frac{2}{5} + \frac{2}{5} = \frac{6}{5}$  $\frac{1}{5} \times 6 = \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} = \frac{6}{5} = 1 \frac{1}{5}$  $\frac{2}{5} \times 3 = \frac{2}{5} + \frac{2}{5} + \frac{2}{5} = \frac{6}{5} = 1 \frac{1}{5}$	
Multiply mixed numbers by a whole number	I can partition $\frac{\square}{\square}$ into $\frac{\square}{\square}$ and $\frac{\square}{\square}$  $2 \frac{2}{3} \times 3 =$  $2 \times 3 = 6 \quad \frac{2}{3} \times 3 = 2$  $2 \frac{2}{3} \times 3 = 6 + 2 = 8$	
Find the whole Children multiply to find the whole from a given part.	If $\frac{1}{\square}$ is ... , then the whole is ... $\times$... $\frac{1}{5}$ of $\underline{\quad}$ = 6  $5 \times 6 = 30$ $\frac{1}{5}$ of 30 = 6 If $\frac{\square}{\square}$ is ... , then $\frac{1}{\square}$ is ... and the whole is ... $\times$... $\frac{4}{7}$ of $\underline{\quad}$ = 24  $\frac{1}{7} = 24 \div 4 = 6$ $7 \times 6 = 42$ $\frac{4}{7}$ of 42 = 24	

YEAR 6	White Rose Maths		
Progression of skills	Representations		Vocabulary
Multiply decimals by integers This is the first time children multiply decimals by numbers other than 10, 100 or 1,000. Encourage them to make links with known facts and whole number multiplication.	I know that ...$\times$...= ..., so I also know that ...$\times$... = ...  $6 \times 2 = 12$  $6 \times 0.2 = 1.2$	I need to exchange 10 ... for 1 ...    $213 \times 4 = 852$  $2.13 \times 4 = 8.52$	order of operations
Multiply fractions by fractions Encourage children to give answers in their simplest form.	When multiplying a pair of fractions, I need to multiply the numerator and multiply the denominator.  $\frac{1}{3} \times \frac{1}{5} = \frac{1}{15}$  $\frac{2}{3} \times \frac{4}{5} = \frac{8}{15}$  $\frac{2}{3} \times \frac{3}{5} = \frac{6}{15} = \frac{2}{5}$		
Find the whole Children multiply to find the whole from a given part.	If $\frac{1}{\square}$ is ... , then the whole is ... $\times$... $\frac{1}{3}$ of ____ = 18  $18 \times 3 = 54$ $\frac{1}{3}$ of 54 = 18	If $\frac{\square}{\square}$ is ... , then $\frac{1}{\square}$ is ... and the whole is ... $\times$... $\frac{4}{9}$ of ____ = 48 $\frac{1}{9} = 48 \div 4 = 12$ $9 \times 12 = 108$ $\frac{4}{9}$ of 108 = 48 	

Calculate percentages

Children first learn how to find 1%, 10%, 20%, 25% and 50% before using multiples of these amounts to find any percentage.

There are ... lots of ... % in 100%
To find ... %, I need to divide by ...

100%			
50%		50%	
25%	25%	25%	25%

50% of ... = ... $\div$ 2

25% of ... = ... $\div$ 4

... % is made up of ... %, and ... %

100%									
10%	10%	10%	10%	10%	10%	10%	10%	10%	10%

To find 30%, I can find 10% and then multiply it by 3

To find 23%, I can use 10% $\times$ 2 and 1% $\times$ 3

To find 99%, I can find 1%, then subtract from 100%

Calculations involving ratio

Encourage children to see the multiplicative relationship between ratios.

They will need to multiply or divide each value by the same number to keep the ratio equivalent.

Double number lines and ratio tables help children to see both horizontal and vertical multiplicative relationships.

For every ... , there are ...

For every 1 adult on a school trip, there are 6 children.

adults



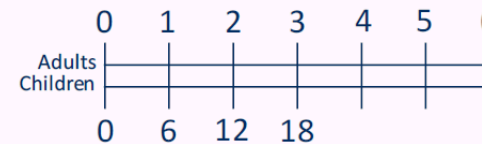
children



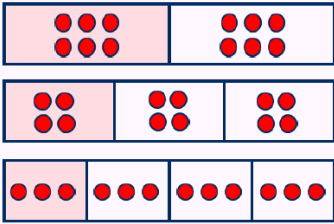
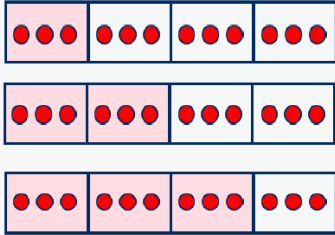
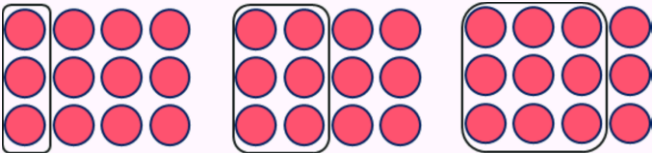
Ratio Table	
Adults	Children
1	6
2	12
3	18

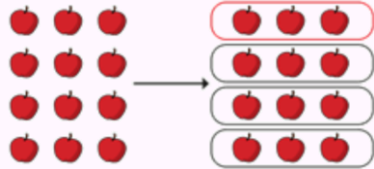
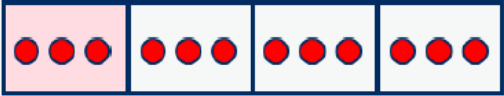
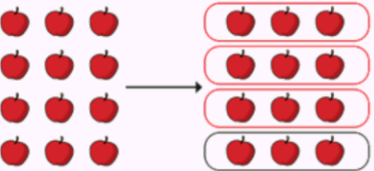
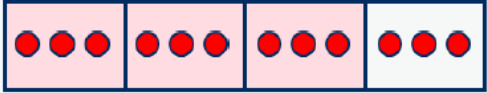
Diagram showing multiplicative relationships: A red arrow from 1 to 3 in the Adults column is labeled $\times 3$. A red arrow from 6 to 18 in the Children column is labeled $\times 3$. A blue arrow from 1 to 6 is labeled $\times 6$. A blue arrow from 3 to 18 is labeled $\times 6$.

The ratio of adults to children is 1 : 6



DIVISION

YEAR 2		White Rose Maths	
Progression of skills	Representations		Vocabulary
Unit fractions In Y2 the focus is on finding $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{3}$. Bar models are useful to show the link between division and finding a fraction.	The objects have been shared fairly into ... groups. $\frac{1}{\square}$ of ... is ... 	There are ... equal parts. There is ... part circled. $\frac{1}{\square}$ is circled. 	divide sharing
Non-unit fractions In Y2 the focus is on finding $\frac{2}{4}$ and $\frac{3}{4}$. Prompt children to notice that $\frac{2}{4}$ is equivalent to $\frac{1}{2}$.	The objects have been shared fairly into ... groups. $\frac{\square}{\square}$ of ... is ... 	There are ... equal parts. There are ... parts circled. $\frac{\square}{\square}$ is circled. 	

YEAR 3	White Rose Maths		
Progression of skills	Representations		Vocabulary
Unit fractions of a set of objects Bar models are useful to show the link between division and fractions, for example, dividing by 3 and finding a third.	The whole is divided into ... equal parts. Each part is $\frac{1}{\square}$ of the whole.  $\frac{1}{4}$ of 12 apples is 3 apples.	One ... of ... is ... $\frac{1}{4}$ of 12 is 3  $\frac{1}{3}$ of 36 is 12 	sharing inverse multiple
Non-unit fractions of a set of objects Bar models are a useful representation and show the links with division and multiplication.	The whole is divided into ... equal parts. Each part is $\frac{1}{\square}$ of the whole.  $\frac{3}{4}$ of 12 apples is 9 apples.	$\frac{1}{\square}$ of ... is ..., so $\frac{\square}{\square}$ of ... is ... $\frac{3}{4}$ of 12 is 9  $\frac{2}{3}$ of 36 is 24 	

YEAR 4		White Rose Maths			
Progression of skills	Representations			Vocabulary	
Divide by 10 and 100 Encourage children to notice that dividing by 100 is the same as dividing by 10 twice.	When I divide by 10, the digits move 1 place value column to the right. ... is one-tenth the size of ...				
	O Tth Hth ● ● ● T O Tth Hth ● ● ● ●				
	O Tth Hth ● ● ● T O Tth Hth ● ● ● ●				
	O Tth Hth ● ● ● T O Tth Hth ● ● ● ●				
	$2 \div 10 = 0.2$	$12 \div 10 = 1.2$			

When I divide by 100, the digits move 2 place value columns to the right. ... is one-hundredth the size of ...	
O Tth Hth ● ● ● T O Tth Hth ● ● ● ●	O Tth Hth ● ● ● T O Tth Hth ● ● ● ●
$2 \div 100 = 0.02$	$12 \div 100 = 0.12$

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Tth

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 $2 \div 10 = 0.2$
 $12 \div 10 = 1.2$

YEAR 5	White Rose Maths																																							
Progression of skills	Representations	Vocabulary																																						
Divide by 10, 100 and 1,000 Encourage children to notice that dividing by 100 is the same as dividing by 10 twice, and that dividing by 1,000 is the same as dividing by 10 three times.	To divide by 10/100/1,000, I move all the digits ... places to the right. ... is one-tenth/one-hundredth/one-thousandth the size of ... <table><tr><th>Th</th><th>H</th><th>T</th><th>O</th><th>Tth</th><th>Hth</th></tr><tr><td></td><td>●</td><td>●●</td><td></td><td>●</td><td></td></tr></table> <table><tr><th>Th</th><th>H</th><th>T</th><th>O</th><th>Tth</th><th>Hth</th></tr><tr><td></td><td></td><td></td><td>●</td><td>●●</td><td></td></tr></table>$120 \div 100 = 1.2$ <table><tr><th>Th</th><th>H</th><th>T</th><th>O</th><th>Tth</th><th>Hth</th></tr><tr><td></td><td></td><td></td><td></td><td>●</td><td>●●</td></tr></table>$120 \div 1,000 = 0.12$	Th	H	T	O	Tth	Hth		●	●●		●		Th	H	T	O	Tth	Hth				●	●●		Th	H	T	O	Tth	Hth					●	●●			
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			●	●●																																				
Th	H	T	O	Tth	Hth																																			
				●	●●																																			
Fraction of an amount Bar models support children to understand that to find a fraction of an amount, we divide by the denominator and multiply by the numerator.	To find $\frac{\square}{\square}$ of ... , I need to divide by ... and multiply by ... <table><tr><td>●●</td><td>●●</td><td>●●</td><td>●●</td><td>●●</td></tr><tr><td>●●</td><td>●●</td><td>●●</td><td>●●</td><td>●●</td></tr></table>$\frac{1}{5}$ of 20 = 4 <table><tr><td>10</td><td>10</td><td>10</td><td>10</td></tr><tr><td>1</td><td>1</td><td>1</td><td>1</td></tr></table>$\frac{1}{4}$ of 84 = 21 $\frac{3}{5}$ of 20 = 12 $\frac{3}{4}$ of 84 = 63	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	10	10	10	10	1	1	1	1	If $\frac{1}{\square}$ is ... , then the whole is ... $\times$... <table><tr><td colspan="5">?</td></tr><tr><td>6</td><td>6</td><td>6</td><td>6</td><td>6</td></tr></table>$\frac{1}{5}$ of ___ = 6 <table><tr><td colspan="5">?</td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr></table>$\frac{4}{7}$ of ___ = 24	?					6	6	6	6	6	?									
●●	●●	●●	●●	●●																																				
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YEAR 6	White Rose Maths	
Progression of skills	Representations	Vocabulary
Divide by 10, 100 and 1,000 Encourage children to notice that dividing by 100 is the same as dividing by 10 twice, and that dividing by 1,000 is the same as dividing by 10 three times.	To divide by ... , I move the digits ... places to the right. $312 \div 10 = 31.2$ $312 \div 100 = 3.12$ $312 \div 1,000 = 0.312$ $906 \div 10 = 90.6$ $906 \div 100 = 9.06$ $906 \div 1,000 = 0.906$	
Divide decimals by integers This is the first time children divide decimals by numbers other than 10, 100 or 1,000	I know that ... $\div$... = ..., so I also know that ... $\div$... = ... $39 \div 3 = 13$ $3.9 \div 3 = 1.3$ $0.39 \div 3 = 0.13$ I need to exchange 1 ... for 10 ... $\begin{array}{r} 1.33 \\ 4 \overline{) 1.33} \\ \underline{4} \\ 13 \\ \underline{12} \\ 13 \\ \underline{12} \\ 1 \end{array}$	
Decimal and fraction equivalents	The fraction ... is equivalent to the decimal ... $\frac{\square}{\square}$ is equal to $\frac{\square}{100}$ $\frac{3}{4} = \frac{75}{100} = 0.75$	

Divide a fraction by an integer This is the first time children divide fractions by an integer.	... ones divided by 2 is ... ones so ... sevenths divided by 2 is ... sevenths. $\frac{4}{7} \div 4 = \frac{1}{7}$ $\frac{4}{7} \div 2 = \frac{1}{7}$	I am dividing by ... , so I can split each part into ... equal parts. $\frac{1}{3} \div 2 = \frac{1}{6}$	... is equivalent to ... so ... $\div$... = ... $\div$... $\frac{2}{3} = \frac{4}{6}$ so $\frac{2}{3} \div 4 = \frac{4}{6} \div 4 = \frac{1}{6}$																															
Fraction of an amount Children divide and multiply to find fractions of an amount. Bar models can still be used to support understanding where needed.	To find $\frac{1}{\square}$ I divide by ... $\frac{1}{2}$ of 36 = $36 \div 2$ $\frac{1}{12}$ of 36 = $36 \div 12$	If $\frac{1}{\square}$ is equal to ..., then $\square$ are equal to ... 2,700 m ? ? $\frac{7}{9}$ of 2,700 = $\frac{1}{9}$ of 2,700 $\times$ 7	If $\frac{\square}{\square}$ is equal to ..., then the whole is equal to ... 48 $\frac{4}{9}$ of ___ = 48																															
Calculate percentages Children first learn how to find 1%, 10%, 20%, 25% and 50% before using multiples of these amounts to find any percentage.	There are ... lots of ... % in 100% To find ... %, I need to divide by ... <table><tr><td colspan="4">100%</td></tr><tr><td colspan="2">50%</td><td colspan="2">50%</td></tr><tr><td>25%</td><td>25%</td><td>25%</td><td>25%</td></tr></table> 50% of ... = ... $\div$ 2 25% of ... = ... $\div$ 4	100%				50%		50%		25%	25%	25%	25%	... % is made up of ... %, and ... % <table><tr><td colspan="10">100%</td></tr><tr><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td></tr></table> To find 30%, I can find 10% and then multiply it by 3 To find 23%, I can use 10% $\times$ 2 and 1% $\times$ 3 To find 99%, I can find 1%, then subtract from 100%	100%										10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
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10%	10%	10%	10%	10%	10%	10%	10%	10%	10%																									

Calculations involving ratio

Encourage children to see the multiplicative relationship between ratios. They will need to multiply or divide each value by the same number to keep the ratio equivalent. Double number lines and ratio tables help children to see both horizontal and vertical multiplicative relationships.

For every ... , there are ...

For every 6 children on a school trip, there is 1 adult.



The ratio of children to adults is 6 : 1

