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Hitherfield Calculation Policy 2026-27

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White Rose objectives - Addition

Year group	White Rose Objectives	Year group	White Rose Objectives
Year 1	• Number bonds within 10 • Addition - add together • Addition - add more • Related facts • Missing number problems	Year 4	• Add [and subtract] 1s, 10s, 100s and 1,000s • Add up to two 4-digit numbers - no exchange; Add two 4-digit numbers - one exchange; Add two 4-digit numbers - more than one exchange • Calculate with money • Add fractions and mixed numbers
Year 2	• Related facts • Bonds to 100 (tens) • Add three 1-digit numbers • Add across a 10 • 10 more[, 10 less] • Add two 2-digit numbers (not across a ten) • Add two 2-digit numbers (across a ten) • Missing number problems	Year 5	• Mental strategies • Add whole numbers with more than 4 digits • Complements to 1 • Add decimals with the same number of decimal places; Add decimals with different numbers of decimal places • Add fractions within 1; Add fractions with total greater than 1
Year 3	• Add [and subtract] 1s; Add [and subtract] 10s; Add [and subtract] 100s • Add two numbers (no exchange) • Add two numbers (across a 10); Add two numbers (across a 100) • Complements to 100 • Add fractions • Hours and minutes - use durations	Year 6	• Negative numbers • Add [and subtract] integers • Order of operations • Add [and subtract] simple fractions; Add [and subtract] any two fractions; Add mixed numbers • Add [and subtract] decimals

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White Rose objectives - Subtraction

Year group	White Rose Objectives	Year group	White Rose Objectives
Year 1	• Number bonds within 10 • Subtraction - find a part • Subtraction - take away/cross out (How many left?) • Related facts • Missing number problems	Year 4	• [Add and] subtract 1s, 10s, 100s and 1,000s • Subtract two 4-digit numbers - no exchange; Subtract two 4-digit numbers - one exchange; Subtract two 4-digit numbers - more than one exchange • Calculate with money • Subtract two fractions; Subtract from whole amounts; Subtract from mixed numbers
Year 2	• Related facts • Subtract across 10 • [10 more,] 10 less • [Add and] subtract 10 • Subtract two 2-digit numbers (not across a 10) • Subtract two 2-digit numbers (across a 10) • Missing number problems	Year 5	• Subtract using mental strategies • Subtract whole numbers with more than 4 digits • Subtract fractions • Complements to 1 • [Add and] subtract decimals across 1
Year 3	• [Add and] subtract 1s; [Add and] subtract 10s; [Add and] subtract 100s • Subtract two numbers (no exchange) • Subtract two numbers (across a 10); Subtract two numbers (across a 100) • Complements to 100 • Subtract fractions	Year 6	• Negative numbers • [Add and] subtract integers • Order of operations • [Add and] subtract decimals • [Add and] subtract simple fractions; [Add and] subtract any two fractions; Subtract mixed numbers • [Add and] subtract decimals

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White Rose objectives - Multiplication

Year group	White Rose objectives	Year group	White Rose objectives
Year 1	• Count in 2s; Count in 10s; Count in 5s • Add equal groups • Make arrays • Make doubles	Year 4	• Times-table facts to 12 × 12 [various objectives] • Multiply by 1 and 0 • Multiply three numbers • Factor pairs • Multiply by 10; Multiply by 100 • Related facts - multiplication and division • Multiply a 2-digit number by a 1-digit number; Multiply a 3-digit number by a 1-digit number • Scaling [no standalone objective but seen in reasoning problems] • Correspondence problems
Year 2	• Multiplication sentences • Use arrays • The 2 times-table • Double • The 10 times-table • The 5 times-table	Year 5	• Multiples; Factors • Square numbers; Cube numbers • Multiply by 10, 100 and 1,000 • Multiply up to a 4-digit number by a 1-digit number • Multiply up to a 4-digit number by a 2-digit number • Multiply a unit fraction by an integer; Multiply a non-unit fraction by an integer • Multiply a mixed number by an integer • Find the whole
Year 3	• The 3 times-table • The 4 times-table • The 8 times-table • Related calculations • Multiply a 2-digit number by a 1-digit number - no exchange • Multiply a 2-digit number by a 1-digit number - with exchange • Scaling • How many ways?	Year 6	• Multiply up to a 4-digit number by a 2-digit number • Order of operations • Multiply fractions by fractions • Fractions of amounts - find the whole • Ratio problems • Multiply decimals by integers • Calculate percentages

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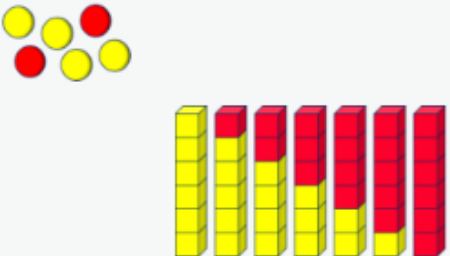
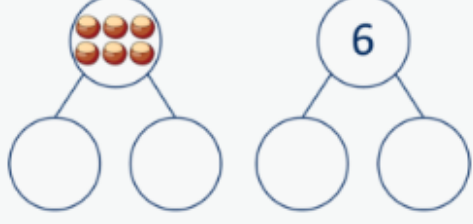
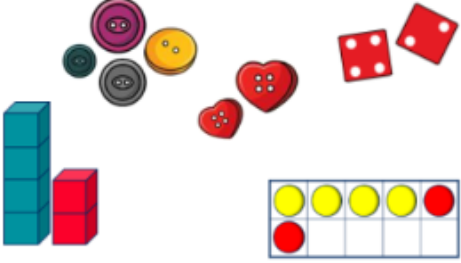
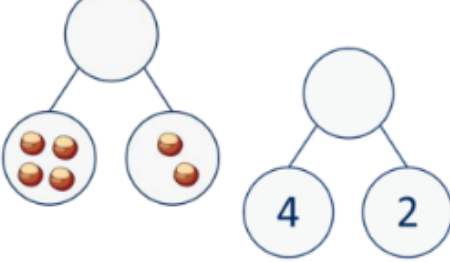


White Rose objectives - Division

Year group	White Rose objectives	Year group	White Rose objectives
Year 1	• Make equal groups - grouping • Make equal groups - sharing • Find a half (various objectives) • Find a quarter (various objectives)	Year 4	• Division facts to 12×12 [various objectives] • Divide a number by 1 and itself • Divide by 10; Divide by 100 • Related facts - multiplication and division • Divide a 2-digit number by a 1-digit number; Divide a 3-digit number by a 1-digit number
Year 2	• Divide by 2 • Divide by 10 • Divide by 5 • Unit fractions • Non-unit fractions	Year 5	• Mental strategies • Divide by 10, 100 and 1,000 • Divide a 4-digit number by a 1-digit number • Fraction of an amount
Year 3	• Divide by 3 • Divide by 4 • Divide by 8 • Related calculations • Divide a 2-digit number by a 1-digit number - no exchange • Divide a 2-digit number by a 1-digit number - flexible partitioning • Divide a 2-digit number by a 1-digit number - with remainders • Unit fractions of a set of objects • Non-unit fractions of a set of objects	Year 6	• Short division • Introduction to long division; Long division with remainders • Order of operations • Divide a fraction by an integer • Fraction of an amount • Ratio problems • Divide by 10, 100 and 1,000 • Divide decimals by integers • Decimal and fraction equivalents • Understand percentages

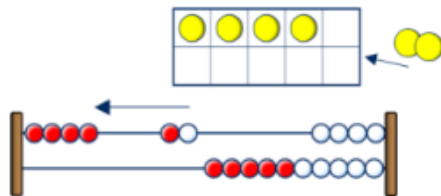
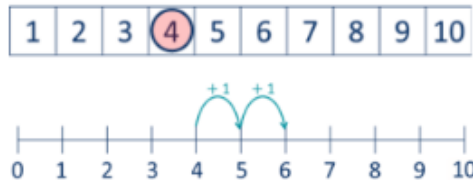
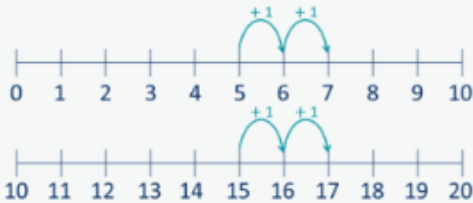
Addition



Year 1	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
Number bonds within 10 <i>Include bonds for each number within 10</i> <i>Encourage children to notice patterns.</i>	Various representations including: 		$6 + 0 = 6$ $5 + 1 = 6$ $4 + 2 = 6$ $3 + 3 = 6$ $2 + 4 = 6$ $1 + 5 = 6$ $0 + 6 = 6$
	... is made of ... and and ... make ... <i>E.g. 6 is made of 2 and 4.</i> <i>2 and 4 make 6.</i>	... can be partitioned into ... and ... <i>E.g. 6 can be partitioned into 2 and 4.</i>	... add ... is equal to ... <i>E.g. 6 add 0 equals 6.</i>
Addition - add together 2 quantities are combined to find the total.			$4 + 2 = 6$ $2 + 4 = 6$ $6 = 4 + 2$ $6 = 2 + 4$
	There are ... There are ... There are ... altogether.	... is a part. ... is a part. ... is the whole.	... add ... is equal to is equal to ... + ... <i>E.g. 4 add 2 is equal to 6. 6 is equal to 4 add 2.</i>

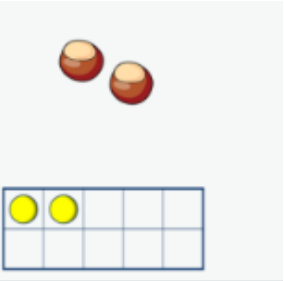
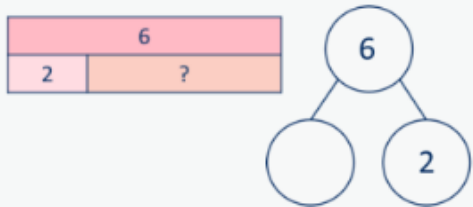
Addition



Year 1		Representations and sentence stems	
	<i>E.g. There are 4 yellow buttons. There are 2 red buttons. There are 6 buttons altogether.</i>	<i>E.g. 4 is a part. 2 is a part. 6 is the whole.</i>	
Addition - add more A quantity is increased.	Various representations including the following: 		$4 + 2 = 6$ $2 + 4 = 6$ $6 = 4 + 2$ $6 = 2 + 4$
	First... then... now... <i>E.g. First there were 4 cats, then 2 arrived, now there are 6 cats.</i>	I start at ... I jump on ... I land on ... <i>E.g. I start at 4. I jump on 2. I land on 6.</i>	... add ... is equal to ... is equal to ... + ... <i>E.g. 4 add 2 is equal to 6. 6 is equal to 4 add 2.</i>
Related facts Make links to known facts.			What patterns do you notice? <i>E.g. I know that 5 add 2 equals 7 so 15 add 2 equals 17.</i>
	I know that ... and ... = ... so ... and ... = ...	... more than ... is ... so ... more than ... is ...	$5 + 2 = 7$ $15 + 2 = 17$

Addition



Year 1	Representations and sentence stems		
	<i>E.g. I know that 5 add 2 equals 7 so 15 add 2 equals 17.</i>	<i>E.g. I know that 5 add 2 equals 7 so 15 add 2 equals 17.</i>	$7 = 5 + 2$ $17 = 15 + 2$
Missing number problems Make links to known facts.	Various representations including the following: 	Various representations including the following: 	$2 + \square = 6$ $6 = 2 + \square$
	How many more do you need to make ...? <i>E.g. I need 4 more to make 6.</i>	If ... is the whole and ... is a part, the other part must be... <i>E.g. If 6 is the whole and 2 is a part, the other part must be 4.</i>	... add ... is equal to ... <i>E.g. 2 add 4 is equal to 6.</i>

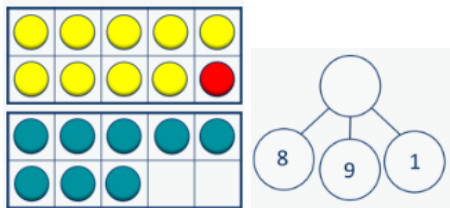
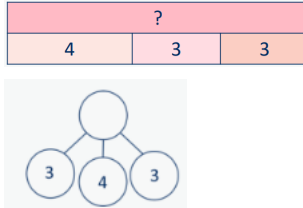
Addition



Year 2			
Representations and sentence stems			
White Rose Objective	Concrete	Pictorial	Abstract
Related facts Make links to known facts.			$5 + 2 = 7$ $15 + 2 = 17$ $25 + 2 = 27...$
	I know that ... and ... = ... so ... and ... = ... <i>E.g. I know that 5 add 2 equals 7 so 15 add 2 equals 17.</i>	... more than ... is ... so ... more than ... is ... <i>E.g. 2 more than 5 is 7 so 2 more than 15 is 17.</i>	What do you notice? Can you continue the pattern?
Bonds to 100 (tens) Make links to known facts within ten.			
	... ones + ... ones = ... ones so ... tens + ... tens = ... tens <i>E.g. 3 ones add 2 ones equals 5 ones so 3 tens add 2 tens equals 5 tens.</i> $3 + 2 = 5$	What is the same? What is different?	

Addition



Year 2			
Representations and sentence stems			
White Rose Objective	Concrete	Pictorial	Abstract
	so... $30 + 20 = 50$		
Add three 1-digit numbers Prompt children to understand that addition can be done in any order and to make links to known facts.			$8 + 9 + 1 =$ $8 + 1 + 9 =$ $9 + 1 + 8 =$
	... and ... are a bond to 10 $10 + \dots = \dots$ <i>E.g. 9 and 1 are a bond to 10. $10 + 8$ equals 18.</i>	Double ... + ... = ... <i>E.g. Double 3 add 4 equals 10.</i>	What do you notice? Which addition is the easiest to calculate?
Add across a 10 Partition the number being added to make a full ten.			
	... can be partitioned into ... and ... <i>E.g. 5 can be partitioned into 2 and 3.</i>	I add ... to get to ... then I add ... <i>E.g. I add 2 to get to 10 then I add 3.</i>	

Addition



Year 2	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
10 more[, 10 less] Make links to known facts.			$30 + 20 = 50$ $34 + 20 = 54$
	... tens + ... tens = ... tens ... tens and ... ones = ... <i>E.g. 3 tens add 2 tens equals 5 tens and 4 ones add 5 tens equals 54.</i>	To add ... I need to add 10 ... times. <i>E.g. To add 20 I need to add 10 2 times.</i>	I know that ... and ... = ... so ... and ... = ... <i>E.g. I know that 30 add 20 equals so 34 add 20 equals 54.</i>
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 <i>E.g.</i> $3 \text{ ones} + 1 \text{ one} = 4 \text{ ones}$ $4 \text{ tens} + 2 \text{ tens} = 6 \text{ tens}$ $6 \text{ tens} + 4 \text{ ones} = 64$	... ones + ... ones = ... ones ... tens + ... tens = ... tens <i>E.g.</i> $3 \text{ ones} + 1 \text{ one} = 4 \text{ ones}$ $4 \text{ tens} + 2 \text{ tens} = 6 \text{ tens}$ $6 \text{ tens} + 4 \text{ ones} = 64$	

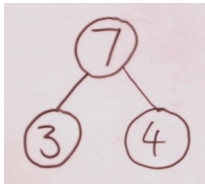
Addition



Year 2	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
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 <i>E.g.</i> <i>There are 12 ones, so I do need to make an exchange.</i> <i>5 ones + 7 ones = 12 ones</i> <i>12 ones = 1 ten and 2 ones</i> <i>4 tens + 3 tens + 1 ten = 8 tens</i> <i>8 tens and 2 ones = 82</i>	There are ... ones, so I do/do not need to make an exchange. ... ones = ... ten and ... ones <i>E.g.</i> <i>There are 12 ones, so I do need to make an exchange.</i> <i>5 ones + 7 ones = 12 ones</i> <i>12 ones = 1 ten and 2 ones</i> <i>4 tens + 3 tens + 1 ten = 8 tens</i> <i>8 tens and 2 ones = 82</i>	
Missing number problems Solve missing number problems and use the inverse to check.		$\square + 3 = 7$ $7 - 3 = \square$	$10 + 8 = 12 + \square$

Addition



Year 2	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
			
	How many more do you need to make ...? <i>E.g. I have 6 and I need 4 more to make 10.</i>	If ... is a whole and ... is a part, then ... is the other part. <i>E.g. If 7 is the whole and 3 is a part then 4 is the other part.</i> <i>[add picture here]</i>	... can be partitioned into ... and ... <i>E.g. 18 can be partitioned into 12 and 6.</i>

Addition



Year 3	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
Add [and subtract] 1s; Add [and subtract] 10s; Add [and subtract] 100s Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.	777 + 2 = 777 + 20 = 777 + 200 =	235 + 3 = 235 + 30 = 235 + 300 = 604 + 20 = 604 + 50 = 604 + 90 = 111 + = 118 111 + = 181 111 + = 811	
	The ones/tens/hundreds column will increase by ... so the total will be ... <i>E.g. The tens column will increase by 20 so the total will be 797.</i>	What patterns do you notice?	

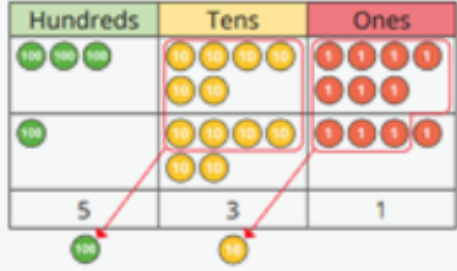
Addition



Year 3			
Representations and sentence stems			
White Rose Objective	Concrete	Pictorial	Abstract
Add two numbers (no exchange) Mental strategies and introduction of formal written method.			
	... ones + ... ones = ... ones ... tens + ... tens = ... tens ... hundreds + ... hundreds = ... hundreds So the total is ... <i>E.g. 2 ones add 5 ones is 7 ones. 4 tens add 3 tens is 7 tens. 3 hundreds add 4 hundreds is 7 hundreds. So the total is 777.</i>	... ones + ... ones = ... ones ... tens + ... tens = ... tens ... hundreds + ... hundreds = ... hundreds So the total is ... <i>E.g. 2 ones add 5 ones is 7 ones. 4 tens add 3 tens is 7 tens. 3 hundreds add 4 hundreds is 7 hundreds. So the total is 777.</i>	

Addition



Year 3	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
Add two numbers (across a 10); Add two numbers (across a 100) Formal written method involving up to 2 exchanges including 3-digit plus 2-digit numbers.			
	... ones + ... ones = ... ones ... tens + ... tens = ... tens ... hundreds + ... hundreds = ... hundreds So the total is ... <i>E.g. 2 ones add 5 ones is 7 ones. 4 tens add 3 tens is 7 tens. 3 hundreds add 4 hundreds is 7 hundreds. So the total is 777.</i>	There are ... ones, so I do/do not need to make an exchange. There are ... tens, so I do/do not need to make an exchange. ... ones = ... ten and ... ones. ... tens = ... hundred and ... tens. <i>E.g. There 11 ones so I do need to make an exchange. There are 12 tens so I do need to make an exchange. 11 ones equals 1 ten and 1 one. 12 tens equals 1 hundred and 2 tens.</i>	

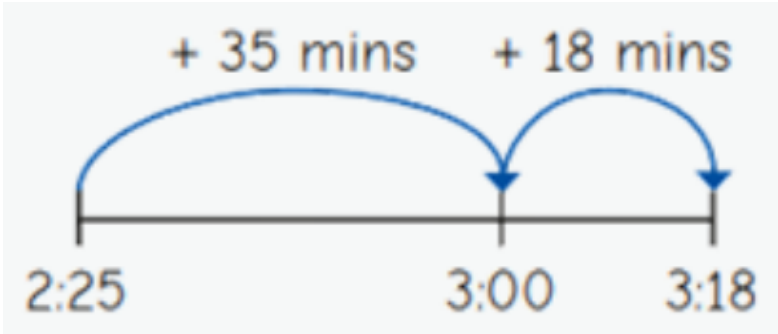
Addition



Year 3	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
Complements to 100 Pairs of numbers which total 100.			$38 + 62 = 100$ $62 + 38 = 100$ $100 = 38 + 62$ $100 = 62 + 38$
	... plus ... is equal to 100 <i>E.g. 38 add 62 is equal to 100.</i>	I add ... to get to the next 10, then ... to get to 100 <i>E.g. I add 2 to get to the next 10, then 60 to get to 100.</i>	I know that ... add ... equals 100 so I also know that ... <i>E.g. I know that 38 add 62 equals 100 so I also know that 62 add 38 equals 100.</i>
Add fractions Make links with known facts.			$\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$
	When adding fractions with the same denominator, I only add the numerator. ... fifths + ... fifths = ... fifths	When adding fractions with the same denominator, I only add the numerator. ... fifths + ... fifths = ... fifths	When adding fractions with the same denominator, I only add the numerator. ... fifths + ... fifths = ... fifths

Addition



Year 3	Representations and sentence stems																		
White Rose Objective	Concrete	Pictorial	Abstract																
	<i>E.g. 2 fifths + 1 fifth equals 3 fifths.</i>	<i>E.g. 2 fifths + 1 fifth equals 3 fifths.</i>	<i>E.g. 2 fifths + 1 fifth equals 3 fifths.</i>																
Hours and minutes - use durations Find durations of time between a given start and end point. Children will need to calculate complements to 60	 For addition part:  <table border="1"> <thead> <tr> <th></th><th>H</th><th>T</th><th>O</th></tr> </thead> <tbody> <tr> <td></td><td>3</td><td>6</td><td>7</td></tr> <tr> <td>+</td><td>1</td><td>6</td><td>4</td></tr> <tr> <td></td><td>5</td><td>3</td><td>1</td></tr> </tbody> </table> From ... to ... o'clock is ... minutes. From ... o'clock to ... is ... minutes. The total time taken is ... minutes. <i>E.g. From 2:25 to 3:00 is 35 minutes. From 3:00 to 3:18 is 18 minutes. The total time taken is 53 minutes.</i>				H	T	O		3	6	7	+	1	6	4		5	3	1
	H	T	O																
	3	6	7																
+	1	6	4																
	5	3	1																

Addition



Year 4	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
Add [and subtract] 1s, 10s, 100s and 1,000s Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.	 $3,425 + 3 =$ $3,425 + 30 =$ $3,425 + 300 =$ $3,425 + 3,000 =$	$2,350 + 3 =$ $2,350 + 30 =$ $2,350 + 300 =$ $2,350 + 3,000 =$ $6,040 + 200 =$ $2,211 + \square = 2,251$ $6,040 + 500 =$ $2,211 + \square = 2,215$ $6,040 + 900 =$ $2,211 + \square = 2,511$	
	The ones/tens/hundreds column will increase by ... so the total will be ... <i>E.g. The hundreds column will increase by 300 so the total will be 3725.</i>	What patterns do you notice?	

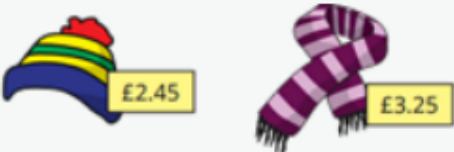
Addition



Year 4			
Representations and sentence stems			
White Rose Objective	Concrete	Pictorial	Abstract
Add up to two 4-digit numbers - no exchange; Add two 4-digit numbers - one exchange; Add two 4-digit numbers - more than one exchange 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 E.g. There are 11 hundreds so I do need to make an exchange. I can exchange 10 hundreds for 1 thousand.	There are ... ones/tens/hundreds so I do/do not need to make an exchange. I can exchange 10 ... for 1 ... <i>E.g. There 11 hundreds so I do need to make an exchange. I can exchange 10 hundreds for 1 thousand.</i>	

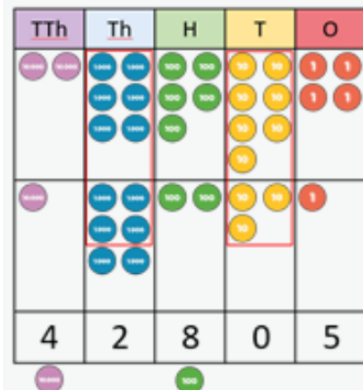
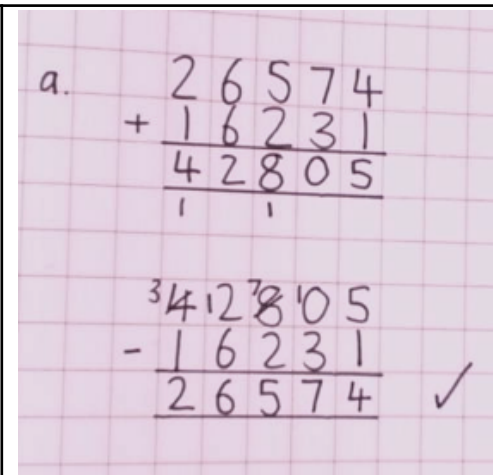
Addition



Year 4			
Representations and sentence stems			
White Rose Objective	Concrete	Pictorial	Abstract
Calculate with money Emphasis on partitioning and use of number lines rather than formal written calculations.	 $45p + 25p = 70p$ $£2 + £3 = £5$ $£5 + 70p = £5.70$		
	... pence + ... pence = ... pence ... pounds + ... pounds = ... pounds <i>E.g. 45p add 25p equals 70p. £2 add £3 equals £5. £5 add 70p equals £5.70.</i>	$£3.25$ can be partitioned into $£3 + 20p + 5p$ <i>E.g. In my first jump I would add £3, then 20p and then 5p. The total is £3.25.</i>	
Add fractions and mixed numbers		 $\frac{1}{5} + \frac{2}{5} = \square$	
	When adding fractions with the same denominator, I only add the numerator. ... fifths + ... fifths = ... fifths <i>E.g. 3 fifths add 5 fifths equals 8 fifths or 1 whole and 3 fifths.</i>		

Addition



Year 5	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
Mental strategies Add 1s, 10s, 100s, etc. to any number. Use number bonds and related facts.	What patterns do you notice? $48,650 + 300 =$ $48,650 + 30,000 =$ $48,650 + 30 =$	To add ..., I can add ... then subtract ... <i>E.g. To add 98, I can add 100 then subtract 2.</i>	
Add whole numbers with more than 4 digits Encourage children to estimate and use inverse operations to check answers to calculations.			
	I can exchange 10 ... for 1 ... <i>E.g. I can exchange 10 tens for 1 hundred.</i>	I can exchange 10 ... for 1 ... <i>E.g. I can exchange 10 tens for 1 hundred.</i>	I can use the inverse to check.

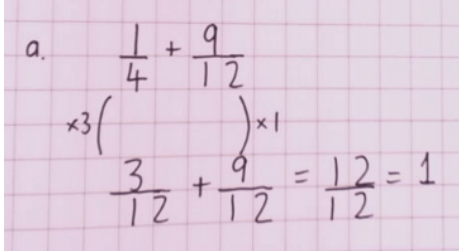
Addition



Year 5			
White Rose Objective			
Representations and sentence stems			
Complements to 1	Concrete	Pictorial	Abstract
	0.3 + = 1 0.35 + = 1		$4 + 6 = 10$ $0.4 + 0.6 = 1$ $44 + 56 = 100$ $0.44 + 0.56 = 1$ $444 + 556 = 1,000$ $0.444 + 0.556 = 1$
	0._ add 0._ equals 1. E.g. 0.4 add 0.6 equals 1 whole.	0.__ add 0.__ equals 1. E.g. 0.43 add 0.57 equals 1 whole.	0.____ add 0.____ equals 1. E.g. 0.432 add 0.568 equals 1 whole.
Add decimals with the same number of decimal places; Add decimals with different numbers of decimal places			
	I do/do not need to make an exchange because ... I can exchange 10 ... for 1 ... E.g. I do need to make an exchange because I have	I do/do not need to make an exchange because ... I can exchange 10 ... for 1 ... E.g. I do need to make an exchange because I have	I do/do not need to make an exchange because ... I can exchange 10 ... for 1 ... E.g. I do need to make an exchange because I have

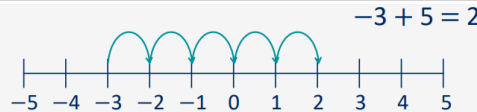
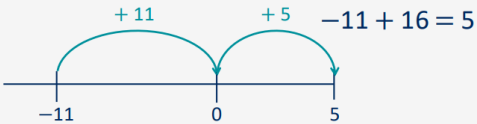
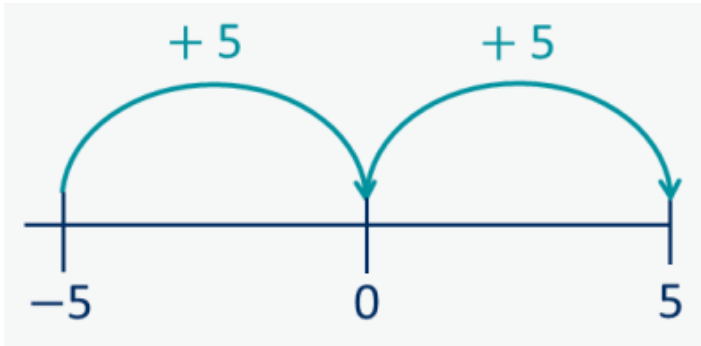
Addition



Year 5	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
	<i>11 hundredths. I can exchange 10 hundredths for 1 tenth.</i>	<i>11 hundredths. I can exchange 10 hundredths for 1 tenth.</i>	<i>11 hundredths. I can exchange 10 hundredths for 1 tenth.</i>
Add fractions within 1; Add fractions with total greater than 1 Encourage children to convert fractions to the same denominator before adding.			
Progress from adding fractions within 1 whole to adding fractions beyond 1 whole.	When adding fractions with the same denominator, I only add the numerator. ... fifths + ... fifths = ... fifths <i>E.g. 3 fifths add 5 fifths equals 8 fifths or 1 whole and 3 fifths.</i>	The denominator has been multiplied by ..., so the numerator needs to be multiplied by... for the fractions to be equivalent.	

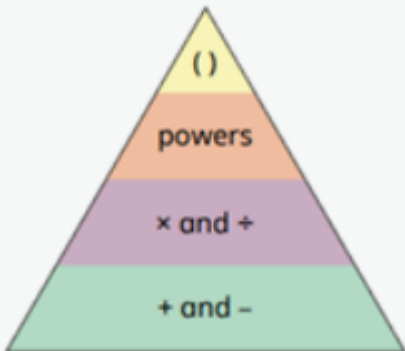
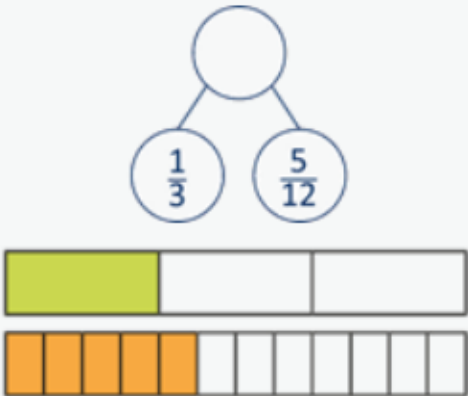
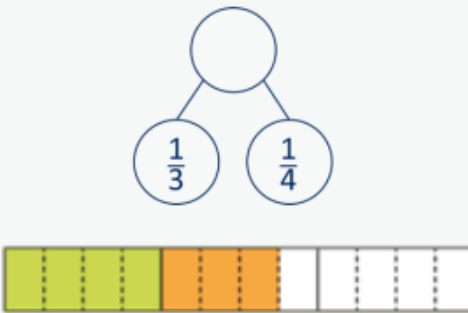
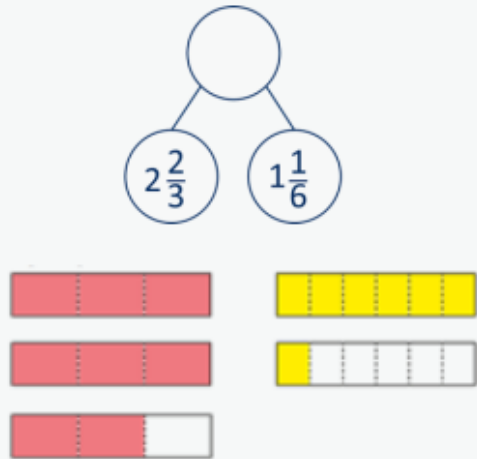
Addition



Year 6	Representations and sentence stems																																																																																
White Rose Objective	Concrete	Pictorial	Abstract																																																																														
Negative numbers Children add to negative numbers and carry out calculations which cross 0.	 	 																																																																															
	... plus ... is equal to ...																																																																																
Add [and subtract] integers 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>3</td><td>4</td><td>6</td><td>2</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>5</td><td>3</td><td>0</td><td>5</td><td>4</td><td>2</td></tr><tr><td></td><td></td><td>1</td><td>1</td><td></td><td></td><td></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					<table><tr><td colspan="3">?</td></tr><tr><td>2,354</td><td>750</td><td>1,500</td></tr></table>	?			2,354	750	1,500	<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>											8	1		8	5			+			0	6					9	9	5		8	
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Addition



Year 6	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
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.		 $(3 + 4) \times 2 = 14$  $3 \times 4 + 2 = 14$	 $3 + 4 \times 2 = 11$
	... has greater priority than ..., so the first part of the calculation I need to do is ...		
Add [and subtract] simple fractions; Add [and subtract] any two fractions; Add mixed numbers 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.		 $\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$	
	The denominator has been multiplied by ..., so the	The lowest common multiple of ... and ... is ...	...is made up of ... wholes and ...

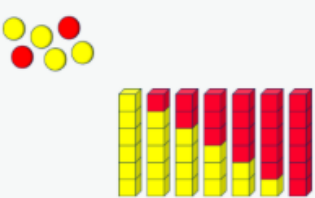
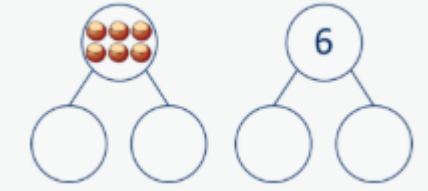
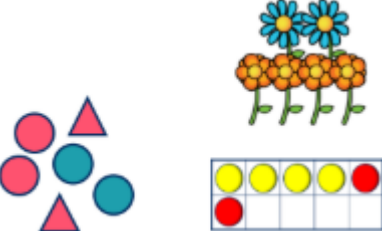
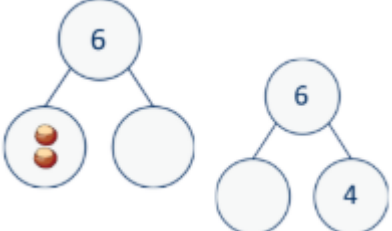
Addition



Year 6	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
	numerator needs to be multiplied by ...		
Add [and subtract] decimals Progress to numbers with digits in different place value columns. Encourage children to check that they have lined up the columns correctly.		$ \begin{array}{r} 3.108 \\ + 2.154 \\ \hline 5.262 \end{array} $	$ \begin{array}{r} 15.027 \\ + 24.607 \\ \hline 39.634 \end{array} $
	I do/do not need to make an exchange because ...		

Subtraction



Year 1	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
Number bonds within 10 Focus on subtraction facts. Encourage children to notice patterns.	Various representations including the following: 		$6 - 0 = 6$ $6 - 1 = 5$ $6 - 2 = 4$ $6 - 3 = 3$ $6 - 4 = 2$ $6 - 5 = 1$ $6 - 6 = 0$
	... is made of ... and and ... make ...	... can be partitioned into ... and ...	... minus ... is equal to ...
Subtraction - find a part Link to number bonds and known facts. E.g. $2 + 4 = 6$ so if 6 is the whole and 4 is a part, the other part must be 2			$6 - 2 = 4$ $6 - 4 = 2$ $4 = 6 - 2$ $2 = 6 - 4$
	There are ... in total. ... are ... How many are not ...?	... is the whole. ... is a part. ... is a part. ... subtract ... is equal to is equal to ... - ...	... subtract ... is equal to is equal to ... - ...

Subtraction



Year 1			
Representations and sentence stems			
White Rose Objective	Concrete	Pictorial	Abstract
Subtraction - take away/cross out (How many left?) A quantity is decreased.	Various representations including the following: 		$6 - 2 = 4$ $6 - 4 = 2$ $4 = 6 - 2$ $2 = 6 - 4$
	First... Then... Now... I start at ...	I jump back ... I land on ...	... minus ... is equal to is equal to ... - ...
Related facts Make links to known facts.			$8 - 3 = 5$ $18 - 3 = 15$ $5 = 8 - 3$ $15 = 18 - 3$
	I know that ... minus ... = ... so ... minus ... = ...	... less than ... is ... so ... less than ... is ...	What patterns do you notice?
Missing number problems Make links to known facts.	Various representations including the following: 	Various representations including the following: 	$6 - \square = 2$ $2 = 6 - \square$
	How many do you need to	If ... is the whole and ... is a	... minus ... is equal to ...

Subtraction



Year 1	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
	subtract to make ...?	part, the other part must	

Subtraction



Year 2	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
Related facts Make links to known facts.			$8 - 3 = 5$ $18 - 3 = 15$ $28 - 3 = 25...$
	I know that ... minus ... = ... so ... minus ... = ...	... less than ... is ... so ... less than ... is ...	What do you notice? Can you continue the pattern?
Subtract across a 10 Partition the number being subtracted to bridge through a ten.			
	... can be partitioned into ... and ...	Make links with related facts.	
[10 more,] 10 less Make links to known facts within ten.			
	... ones - ... ones = ... ones so ... tens - ... tens = ... tens	What is the same? What is different?	

Subtraction



Year 2	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
[Add and] subtract 10 Make links to known facts.			$50 - 20 = 30$ $54 - 20 = 34$
	... tens – ... tens = ... tens ... tens and ... ones = ...	To subtract ... I need to subtract 10 ... times.	I know that ... minus ... = ... so ... minus ... = ...
Subtract two 2-digit numbers (not across a 10)			
	3 ones – 1 one = 2 ones 4 tens – 2 tens = 2 tens 2 tens and 2 ones = 22...	ones – ... ones = ... ones ... tens – ... tens = ... tens	

Subtraction



Year 2		Representations and sentence stems	
White Rose Objective	Concrete	Pictorial	Abstract
Subtract two 2-digit numbers (across a 10) Partition the number being subtracted to bridge through a ten.			
	I need to make an exchange because I do not have enough ones to subtract ... ones 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		
Missing number problems Solve missing number problems and use the inverse to check.			

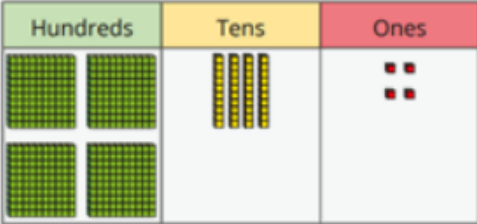
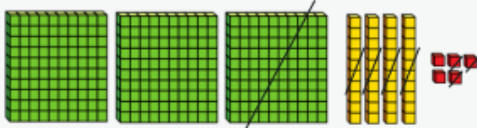
Subtraction



Year 2	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
	How many do you need to subtract to make ...?	If ... is a whole and ... is a part, then ... is the other part.	... can be partitioned into ... and ...

Subtraction



Year 3			
Representations and sentence stems			
White Rose Objective	Concrete	Pictorial	Abstract
[Add and] subtract 1s; [Add and] subtract 10s; [Add and] subtract 100s Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.	 $444 - 2 =$ $444 - 20 =$ $444 - 200 =$	 $777 - 4 =$ $777 - 40 =$ $777 - 400 =$	$235 - 3 =$ $235 - 30 =$ $235 - 300 =$ $624 - 20 =$ $654 - 50 =$ $694 - 90 =$ $118 - \square = 111$ $181 - \square = 111$ $811 - \square = 111$
	The ones/tens/hundreds column will decrease by ... <i>E.g. The tens column will decrease by 2 tens.</i>		What patterns do you notice?
Subtract two numbers (no exchange) Mental strategies and introduction of formal written method.			

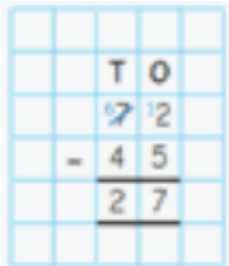
Subtraction



Year 3			
Representations and sentence stems			
White Rose Objective	Concrete	Pictorial	Abstract
	... ones – ... ones = ... ones ... tens – ... tens = ... tens ... hundreds – ... hundreds = ... hundreds <i>E.g. 5 ones subtract 3 ones equals 2 ones. 4 tens subtract 4 tens equals 0 tens. 3 hundreds subtract 1 hundred equals 2 hundreds.</i>	... ones – ... ones = ... ones ... tens – ... tens = ... tens ... hundreds – ... hundreds = ... hundreds <i>E.g. 5 ones subtract 3 ones equals 2 ones. 4 tens subtract 4 tens equals 0 tens. 3 hundreds subtract 1 hundred equals 2 hundreds.</i>	... ones – ... ones = ... ones ... tens – ... tens = ... tens ... hundreds – ... hundreds = ... hundreds <i>E.g. 9 ones subtract 7 ones equals 2 ones. 6 tens subtract 4 tens equals 2 tens. 7 hundreds subtract 1 hundred equals 6 hundreds.</i>
Subtract two numbers (across a 10); Subtract two numbers (across a 100) Formal written method involving up to 2 exchanges including 3-digit subtract 2-digit numbers			

Subtraction



Year 3	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
			
	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 ... <i>E.g. I do need to make an exchange. I need to exchange 1 ten for 10 ones.</i>	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 ... <i>E.g. I do need to make an exchange. I need to exchange 1 ten for 10 ones. I need to exchange 1 hundred for 10 tens.</i>	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 ... <i>E.g. I do need to make an exchange. I need to exchange 1 ten for 10 ones.</i>

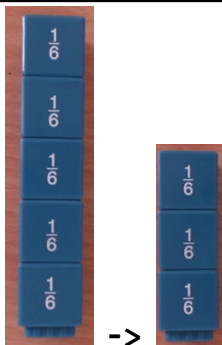
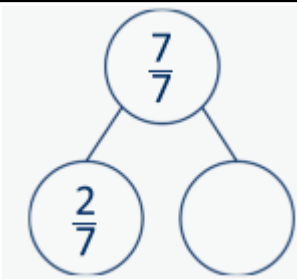
Subtraction



Year 3	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
Complements to 100 Focus on subtraction facts. Encourage children to notice patterns.		$100 - 38 = 62$ $100 - 62 = 38$ $62 = 100 - 38$ $38 = 100 - 62$	
	100 minus ... is equal to ... <i>E.g. 100 minus 38 equals 62.</i>	I subtract ... tens, then I subtract ... ones <i>E.g. I subtract 3 tens, then I subtract 8 ones.</i>	100 minus ... is equal to ... <i>E.g. 100 minus 38 equals 62.</i>
Subtract fractions Make links with known facts.			$\frac{4}{5} - \frac{1}{5} =$ $\frac{7}{8} - \frac{3}{8} =$ $\frac{3}{4} - \frac{1}{4} =$

Subtraction



Year 3	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
			
	My starting fraction is $\frac{\quad}{\quad}$. I subtract $\frac{\quad}{\quad}$. My remaining fraction is $\frac{\quad}{\quad}$. <i>E.g. I start with $\frac{4}{5}$. I subtract $\frac{1}{5}$. I now have $\frac{3}{5}$.</i>	When subtracting fractions with the same denominator, I only subtract the numerator. ... fifths – ... fifths = ... fifths <i>E.g. 4 fifths subtract 1 fifth equals 3 fifths.</i>	When subtracting fractions with the same denominator, I only subtract the numerator. ... fifths – ... fifths = ... fifths <i>E.g. 4 fifths subtract 1 fifth equals 3 fifths.</i>

Subtraction



Year 4			
Representations and sentence stems			
White Rose Objective	Concrete	Pictorial	Abstract
[Add and] subtract 1s, 10s, 100s and 1,000s Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.	 $3,425 - 2 =$ $3,425 - 20 =$ $3,425 - 200 =$ $3,425 - 2,000 =$	$4,356 - 3 =$ $4,356 - 30 =$ $4,356 - 300 =$ $4,356 - 3,000 =$ $6,940 - 200 =$ $6,940 - 300 =$ $6,940 - 400 =$ $4,433 - \square = 4,430$ $4,433 - \square = 4,033$ $4,433 - \square = 4,403$	
	The ones/tens/hundreds/thousands column will decrease by ... <i>E.g. If I subtract 200, the hundreds column will decrease by 2.</i>	What patterns do you notice? <i>E.g. I notice that whichever unit I am subtracting, that unit decreases in the answer.</i>	

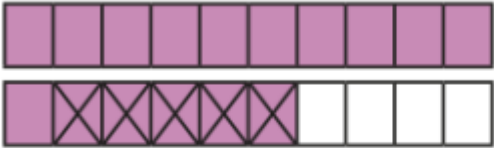
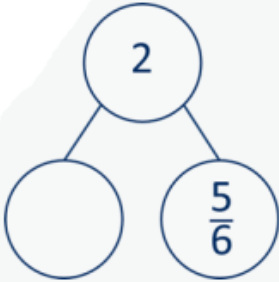
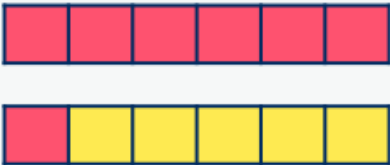
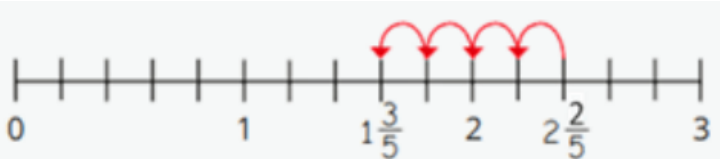
Subtraction



Year 4			
Representations and sentence stems			
White Rose Objective	Concrete	Pictorial	Abstract
Subtract two 4-digit numbers - no exchange; Subtract two 4-digit numbers - one exchange; Subtract two 4-digit numbers - more than one exchange Formal written method with up to 3 exchanges. Encourage children to estimate and use inverse operations to check answers to calculations.			
	I need to subtract... ones/tens/hundreds. I do/do not need to make an exchange. I can exchange 1... for 10... <i>E.g. I need to subtract 8 ones from 6 ones so I need to make an exchange. I can exchange 1 ten for 10 ones.</i>	I need to subtract... ones/tens/hundreds. I do/do not need to make an exchange. I can exchange 1... for 10... <i>E.g. I need to subtract 8 ones from 6 ones so I need to make an exchange. I can exchange 1 ten for 10 ones.</i>	

Subtraction



Year 4	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
Subtract two fractions; Subtract from whole amounts; Subtract from mixed numbers Include subtracting fractions from wholes.	Various representations can be used as follows. For subtracting fractions from mixed numbers with the same denominator, children should be exposed to the numberline method as below.  $\frac{16}{10} - \frac{5}{10}$  $\frac{16}{10} - \frac{9}{10}$    		
	When subtracting fractions with the same denominator, I only subtract the numerator.		

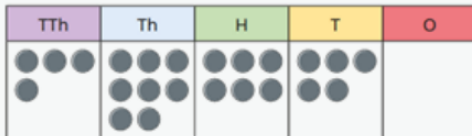
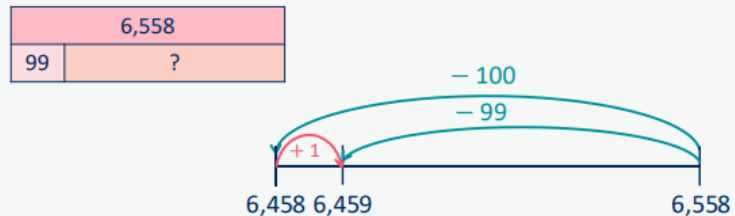
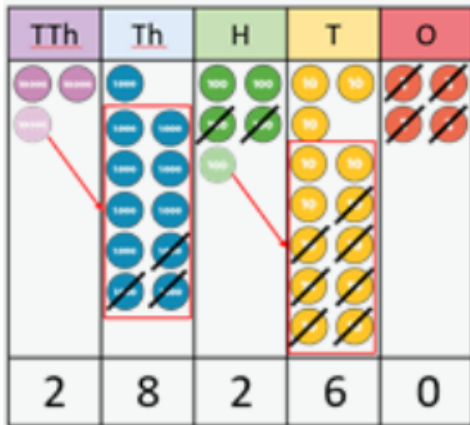
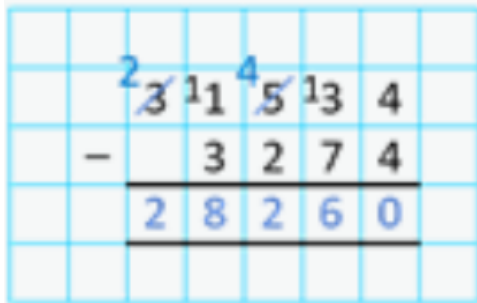
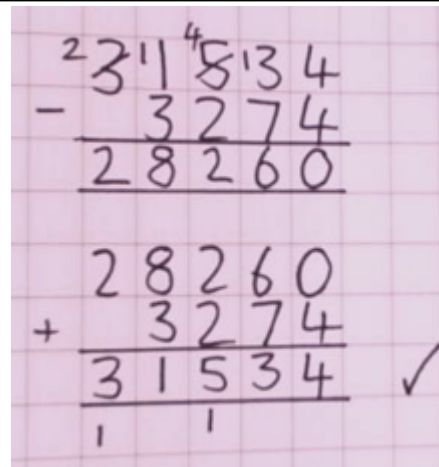
Subtraction



Year 4	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
	... tenths – ... tenths = ... tenths <i>E.g. I have 2 and $\frac{2}{10}$. To subtract $\frac{4}{10}$, I can jump back four intervals on the number line.</i>		
Calculate with money Emphasis here is on partitioning and use of number lines rather than formal written calculations in order to develop a conceptual understanding of units of money i.e. there are 100p in £1.			
	£3.26 can be partitioned into £3 + 20p + 6p.		

Subtraction



Year 5		Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract	
Subtract using mental strategies Subtract 1s, 10s, 100s etc from any number. Use number bonds and related facts.	Visualising this model:  $48,650 - 300 =$ $48,650 - 30,000 =$ $48,650 - 30 =$	Children can use more complex mental strategies to subtract 1, 10 and 100 etc. from any number. 		
	Which column changes when you subtract _? <i>E.g. If I subtract 30,000, the ten thousands column changes by 3.</i>	To subtract ..., I can subtract ... then add ... E.g. To subtract 99, I can subtract 100 then add 1.		
Subtract whole numbers with more than 4 digits Encourage children to estimate and use inverse operations to check answers to calculations.				

Subtraction



Year 5		Representations and sentence stems	
White Rose Objective	Concrete	Pictorial	Abstract
	I can take 1 ... and exchange it for 10 ... <i>E.g. I can take 1 hundred and exchange it for 10 tens.</i>	I can take 1 ... and exchange it for 10 ... <i>E.g. I can take 1 hundred and exchange it for 10 tens.</i>	I estimate my answer to be _. I can use the inverse to check my answer. The calculation I need to use is _. <i>E.g. I estimate my answer to be approximately 28,000.</i> <i>The inverse calculation I need to use to check my calculation is $28,260 + 3274$.</i>
Subtract fractions Convert fractions to the same denominator before subtracting. Progress from subtracting fractions within 1 whole to subtracting from a mixed number.	Various representations can be used as follows. For subtracting fractions from mixed numbers with the denominators that are a multiple of one another, children should be exposed to the numberline method as below.		

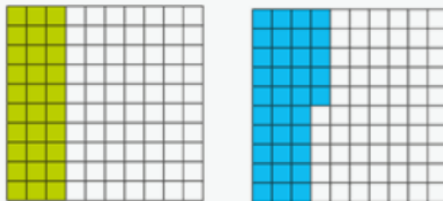
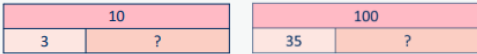
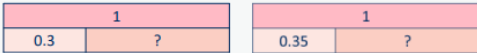
Subtraction



Year 5	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
	$\frac{3}{4} - \frac{1}{8}$ $\times 2 \left(\frac{6}{8} - \frac{1}{8} = \frac{5}{8} \right) \times 1$ $\frac{2}{3} - \frac{2}{9} = \frac{6}{9} - \frac{2}{9} = \frac{4}{9}$ The denominator has been multiplied by ..., so the numerator needs to be multiplied by... for the fractions to be equivalent. <i>E.g. I need to make the denominators the same before subtracting. I can do this by multiplying both the denominator and the numerator by 3. I can now subtract the smaller fraction.</i>		

Subtraction



Year 5	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
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.	$0.3 + \square = 1$ $0.35 + \square = 1$   	 $10 - 4 = 6$ $100 - 44 = 56$ $1,000 - 444 = 556$ $1 - 0.4 = 0.6$ $1 - 0.44 = 0.56$ $1 - 0.444 = 0.556$	
	Various representations should be used to encourage children to make links to bonds to 10 and compliments to 100 and 1000.		

Subtraction



Year 5	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
[Add and] subtract decimals across 1 Progress from the same number of decimal places to a different number of decimal places and from no exchange to exchange.	O Tth Hth 1 1 1 1 0.1 0.1 0.1 0.1 0.1 0.01 0.01 0.01 0.01 0.01 0.01 4.56 - 1.32 3.24	2 • 3 2 - 1 • 1 7 1 • 2 5	2 4 • 4 - 3 • 1 2 •
		I can exchange _ tenth for __ hundredths. <i>E.g. I can exchange 1 tenth for 10 thousandths.</i>	I can exchange _ tenth for __ hundredths. <i>E.g. I can exchange 1 tenth for 10 thousandths.</i>

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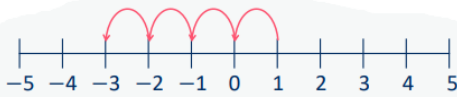
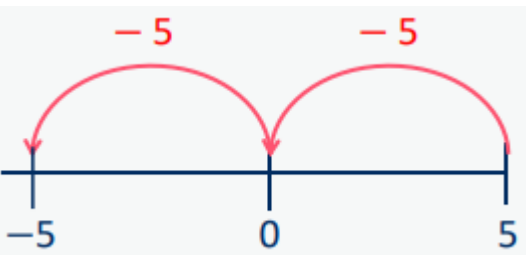
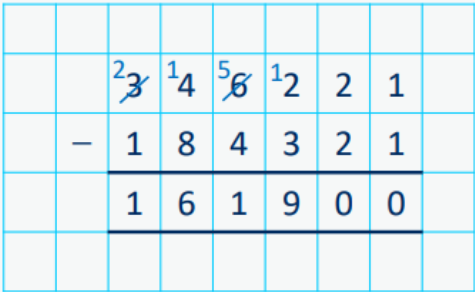
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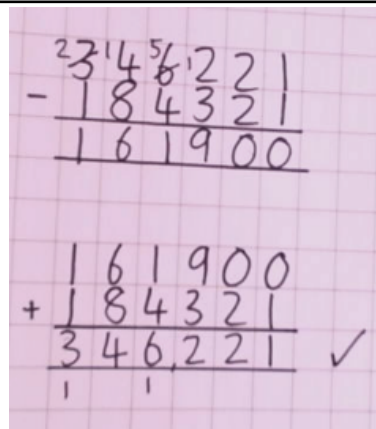
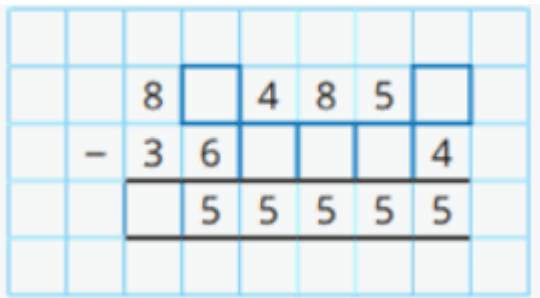
Subtraction



Year 6	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
Negative numbers Children subtract from positive and negative numbers and calculate intervals across 0.	$-1 - 4 = -5$ 		
	$1 - 4 = -3$ 	The difference between -5 and -1 is 4. 	The difference between 5 and -5 is 10.
	... minus ... is equal to ...	The difference between ... and ... is ...	
[Add and] subtract integers Encourage children to estimate and use inverse operations to check answers to calculations.		Once children can confidently subtract using the formal method, they should be encouraged to estimate their answers and check using the inverse. Reasoning activities should encourage these skills too, as below.	

Subtraction



Year 6	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
			
	I can exchange 1 ... for 10 ... <i>E.g. I can exchange 1 ten thousand for 10 thousands.</i>	I estimate my answer to be ____. I can use the inverse to check my answer. The calculation I need to use is ____. <i>E.g. I estimate my answer to be approximately 150,000.</i> <i>The inverse calculation I need to use to check my calculation is 161,900 + 184,321.</i>	
Order of operations Children learn the order of priority for operations in a calculation. Calculations in brackets should be done First before moving on to indices. Multiplication and	The acronym BIDMAS can be used for children to identify the order of operations.		

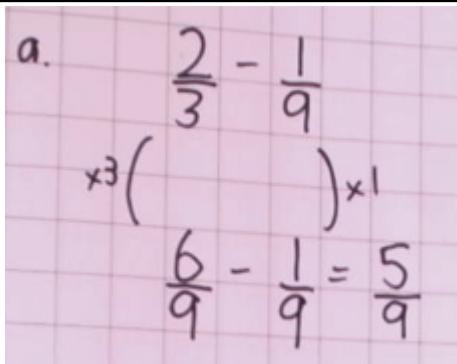
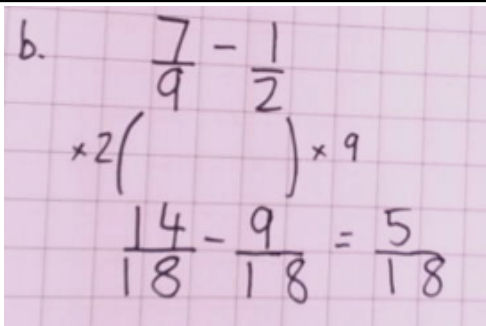
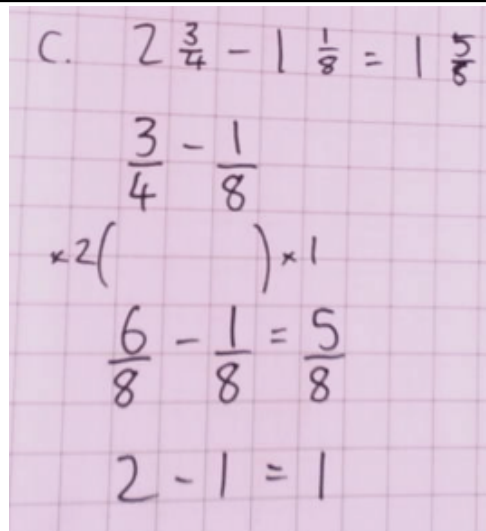
Subtraction



Year 6	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
division should be performed before addition and subtraction.	B rackets I ndices D ivide M ultiply A dd S ubtract $(8 - 2) \times 3 = 18$		
	... has greater priority than ..., so the first part of the calculation I need to do is ... E.g. I need to carry out the part of the calculation in brackets first which is 6. This can then be multiplied by 6. The answer is 18.		

Subtraction



Year 6	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
[Add and] subtract simple fractions; [Add and] subtract any two fractions; Subtract mixed numbers 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.	 (A fraction wall can be used to support those children who would benefit from a visual representation).		
	The denominator has been multiplied by ..., so the numerator needs to be multiplied by...	The lowest common multiple of ... and ... is ...	... is made up of ... wholes and ...

Subtraction



Year 6	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
[Add and] subtract decimals Progress from the same number of decimal and whole number places to a different number of decimal and whole number places.	O Tth Hth 1 1 1 1 0.1 0.1 0.1 0.1 0.1 0.01 0.01 0.01 0.01 0.01 0.01 4.56 - 1.32 3.24	2 • 3 2 - 1 • 1 7 1 • 2 5	2 4 • 4 - 3 • 1 2 •
		I can exchange _ tenth for __ hundredths. <i>E.g. I can exchange 1 tenth for 10 thousandths.</i>	I can exchange _ tenth for __ hundredths. <i>E.g. I can exchange 1 tenth for 10 thousandths.</i>

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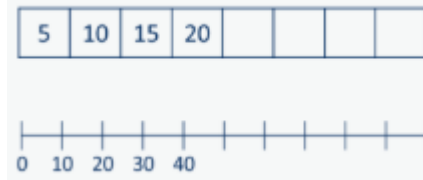
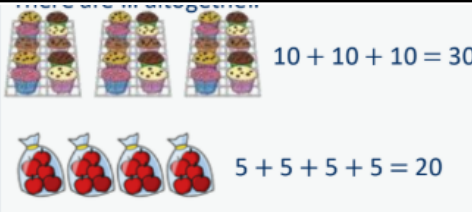
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Multiplication



Year 1	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
Count in 2s; Count in 10s; Count in 5s Begin by counting objects that naturally come in 2s, 5s and 10s, for example pairs of socks or fingers.			
	There are ... equal groups of ... There are ... altogether.	Continue to colour in ...s What do you notice?	Complete the number track/number line by counting in ...s.
Add equal groups Children should be able to write a repeated addition to represent equal groups and to draw pictures or use objects to represent a repeated addition.		$2 + 2 + 2 =$ $5 + 5 + 5 =$ $10 + 10 + 10 =$ Use objects or a drawing to represent the equal groups and find how many in total.	
	There are ... groups of ... There are ... altogether.	What is the same? What is different?	
Make arrays Children use their knowledge of adding equal	Various representations including the following:		

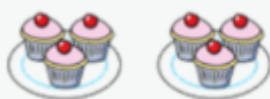
Multiplication



Year 1	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
groups to arrange objects in columns and rows.			
	There are ... rows of ... There are ... altogether. There are ... columns of ... There are ... altogether.		
Make doubles Children understand that doubles are two equal groups. Children may begin to explore doubles beyond 20 using base 10.	Various representations including the following: 		
	Double ... is + ... = ...		

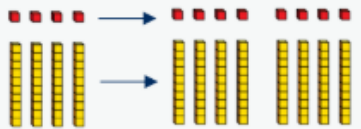
Multiplication



Year 2	Representations and sentence stems																																
White Rose Objective	Concrete	Pictorial	Abstract																														
Multiplication sentences Encourage children to make the link between repeated addition and multiplication.	<table data-bbox="949 427 1151 517"><tr><td>6</td></tr><tr><td>3</td><td>3</td></tr></table>$3 + 3 = 6$ $2 \times 3 = 6$ <table data-bbox="893 588 1196 668"><tr><td>20</td></tr><tr><td>5</td><td>5</td><td>5</td><td>5</td></tr></table>$5 + 5 + 5 + 5 = 20$ $4 \times 5 = 20$			6	3	3	20	5	5	5	5																						
6																																	
3	3																																
20																																	
5	5	5	5																														
	There are ... equal groups with ... in each group. There are ... altogether.																																
Use arrays Encourage children to see that multiplication is commutative.	$3 \text{ lots of } 5 = 15$ $5 + 5 + 5 = 15$ $5 \text{ lots of } 3 = 15$ $3 + 3 + 3 + 3 + 3 = 15$		$3 \times 5 = 15$ $5 \times 3 = 15$ $3 \times 5 = 5 \times 3$																														
	There are ... rows with ... in each row. There are ... columns with ... in each column.		I can see ... $\times$... and ... $\times$...																														
The 2 times-table Encourage daily counting in multiples both forwards and back. Notice that all multiples of 2 are even numbers.	... lots/groups of 2 = ... $\times$ 2 = Various representations including the following:		... times 2 is equal to ... <table data-bbox="1666 1169 2069 1299"><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>$1 \times 2 = 2$ $2 = 1 \times 2$ $2 \times 2 = 4$ $4 = 2 \times 2$ $3 \times 2 = 6$ $6 = 3 \times 2$	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
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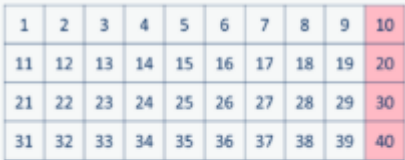
Multiplication



Year 2			
Representations and sentence stems			
White Rose Objective	Concrete	Pictorial	Abstract
			
	Start with using 'lots/ groups', e.g. <i>4 groups of 2 equals 8</i> . Then progress on to using 'times', e.g. <i>4 times 2 equals 8</i> .		
Double Encourage children to make links with related facts.			
	Double 4 = 4 + 4. Double 4 is 8.	Double 4 is 8. Double 40 is 80.	
	Double ... is ... so double ... is ...		
The 10 times-table Encourage daily counting in multiples both forwards and back. Notice the pattern in the numbers.	... lots/groups of 10 = ... × 10 =	.. times 10 is equal to ...	

Multiplication



Year 2		Representations and sentence stems	
White Rose Objective	Concrete	Pictorial	Abstract
		 $1 \times 10 = 10$ $10 = 1 \times 10$ $2 \times 10 = 20$ $20 = 2 \times 10$ $3 \times 10 = 30$ $30 = 3 \times 10$	
	Start with using 'lots/ groups', e.g. <i>4 groups of 10 equals 40.</i> Then progress on to using 'times', e.g. <i>4 times 10 equals 40.</i>		
The 5 times-table Encourage daily counting in multiples both forwards and back. Notice the pattern in the numbers.	... lots/groups of = ... $\times 5 =$	... times is equal to ...	

Multiplication



Year 2	Representations and sentence stems																																										
White Rose Objective	Concrete	Pictorial	Abstract																																								
	  	<table border="1"><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></table> $1 \times 5 = 5$ $5 = 1 \times 5$ $2 \times 5 = 10$ $10 = 2 \times 5$ $3 \times 5 = 15$ $15 = 3 \times 5$ 	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	
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31	32	33	34	35	36	37	38	39	40																																		
	Start with using ‘lots/ groups’, e.g. <i>4 groups of 5 equals 20.</i> Then progress on to using ‘times’, e.g. <i>4 times 5 equals 20.</i>																																										

Multiplication



Year 3	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
The 3 times-table Encourage daily counting in multiples both forwards and back.	Various representations should be used to embed conceptual understanding, including the vocabulary variations below. These are present in the White Rose planning as well as the Number Sense conceptual sessions. ... groups of 3 = ... $\times 3$ = 3, ... times = $3 \times \dots$ = ... times 3 is equal to ... $4 \times 3 = 12$ $12 = 4 \times 3$		

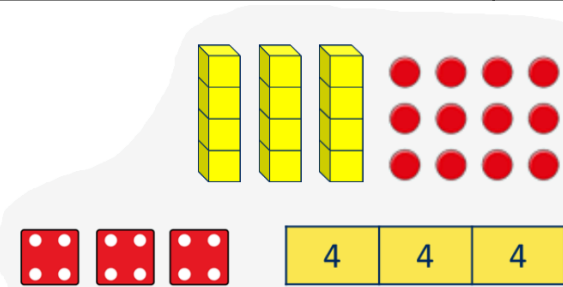
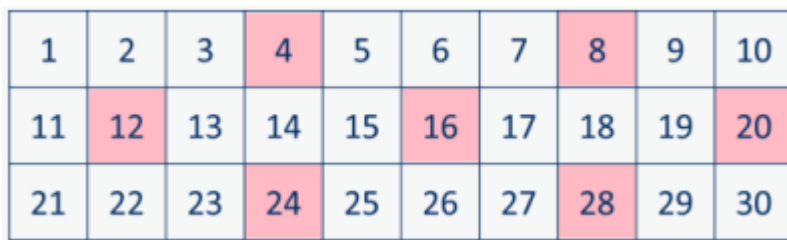
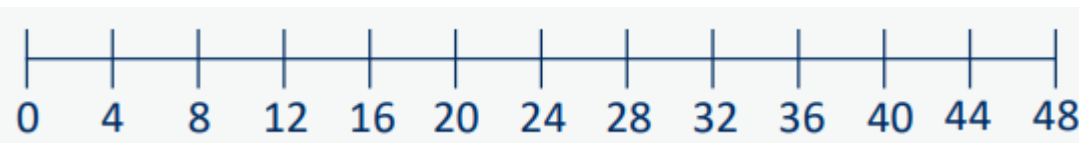
Multiplication



Year 3	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
	Start with using 'groups', e.g. <i>4 groups of 3 equals 12</i>. Then progress on to using 'times', e.g. <i>4 times 3 equals 12</i>.		
The 4 times-table Encourage daily counting in multiples both forwards and back. Encourage children to notice links between the 2 and 4 times-tables.	Various representations should be used to embed conceptual understanding, including the vocabulary variations below. These are present in the White Rose planning as well as the Number Sense conceptual sessions. ... groups of 4 = ... $\times$ 4 = 4, ... times = $4 \times$... = ... times 4 is equal to ... $3 \times 4 = 12$ $12 = 3 \times 4$		

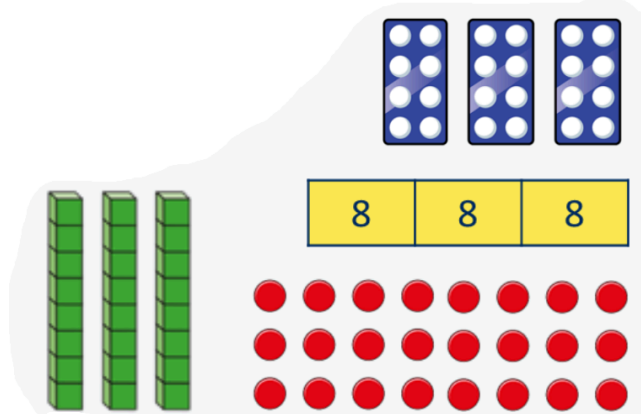
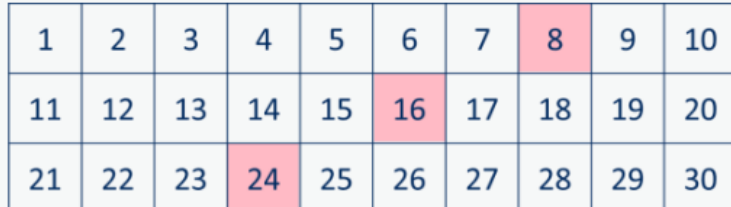
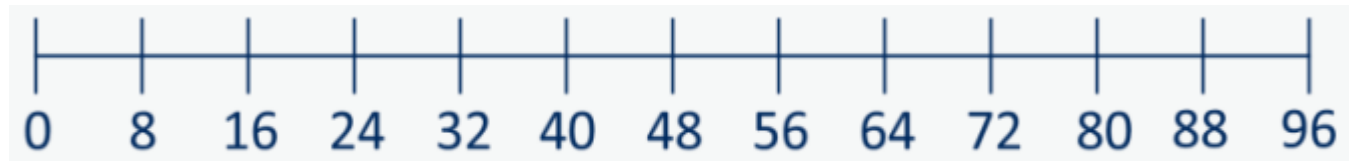
Multiplication



Year 3	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
	  		
	Start with using 'groups', e.g. <i>3 groups of 4 equals 12</i>. Then progress on to using 'times', e.g. <i>3 times 4 equals 12</i>.		
The 8 times-table Encourage daily counting in multiples both forwards and back. Encourage children to notice links between the 2, 4 and 8 times-tables.	Various representations should be used to embed conceptual understanding, including the vocabulary variations below. These are present in the White Rose planning as well as the Number Sense conceptual sessions. ... groups of 8 = ... $\times 8$ = 8, ... times = $8 \times \dots$ = ... times 8 is equal to ... $3 \times 8 = 24$ $24 = 3 \times 8$		

Multiplication



Year 3	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
	  		
	Start with using 'groups', e.g. <i>3 groups of 8 equals 24.</i> Then progress on to using 'times', e.g. <i>3 times 8 equals 24.</i>		
Related calculations Use knowledge of multiplying by 10 to scale times-table facts.			$3 \times 4 = 12$ $3 \times 40 = 120$
	$3 \times 4 = 12$		

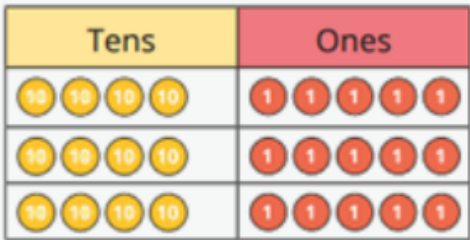
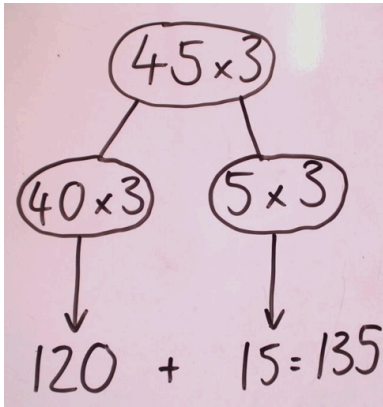
Multiplication



Year 3	Representations and sentence stems												
White Rose Objective	Concrete	Pictorial	Abstract										
	$3 \times 40 = 120$... $\times$... ones is equal to ... ones so ... $\times$... tens is equal to ... tens. <i>E.g. 3×4 ones is equal to 12 ones so 3×4 tens is equal to 12 tens.</i>		 ... $\times$... ones is equal to ... ones so ... $\times$... tens is equal to ... tens. <i>E.g. 3×4 ones is equal to 12 ones so 3×4 tens is equal to 12 tens.</i>										
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.	<table><tr><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table> $21 \times 4 = 84$ [completed at end of calculation] $20 \times 4 = 80$ $1 \times 4 = 4$ $80 + 4 = 84$	Tens	Ones									 $21 \times 4 = 84$ [completed at end of calculation] $20 \times 4 = 80$ $1 \times 4 = 4$	 $21 \times 4 = 84$ [completed at end of calculation] $20 \times 4 = 80$ $1 \times 4 = 4$ $80 + 4 = 84$
Tens	Ones												

Multiplication



Year 3		Representations and sentence stems	
White Rose Objective	Concrete	Pictorial	Abstract
	... tens multiplied by ... is equal to ... tens. ...ones multiplied by ... is equal to ... ones. <i>E.g. I can partition 21 into 20 and 1. 20 times 4 equals 80 and 1 times 4 equals 4. When I add these total together I get 84 which is my answer.</i>	... tens multiplied by ... is equal to ... tens. ...ones multiplied by ... is equal to ... ones. <i>E.g. I can partition 21 into 20 and 1. 20 times 4 equals 80 and 1 times 4 equals 4. When I add these total together I get 84 which is my answer.</i>	... tens multiplied by ... is equal to ... tens. ...ones multiplied by ... is equal to ... ones. <i>E.g. I can partition 21 into 20 and 1. 20 times 4 equals 80 and 1 times 4 equals 4. When I add these total together I get 84 which is my answer.</i>
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.	 $45 \times 3 = 135$ [completed at end of calculation] $40 \times 3 = 120$ $5 \times 3 = 15$ $120 + 15 = 135$	 $45 \times 3 = 135$ [completed at end of calculation] $40 \times 3 = 120$ $5 \times 3 = 15$	$21 \times 4 = 84$ [completed at end of calculation] $20 \times 4 = 80$ $1 \times 4 = 4$ $80 + 4 = 84$

Multiplication



Year 3	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
	... tens multiplied by ... is equal to ... tens. ...ones multiplied by ... is equal to ... ones. <i>E.g. I can partition 45 into 40 and 5. 40 times 3 equals 120 and 5 times 3 equals 15. When I add these total together I get 135 which is my answer.</i>	120 + 15 = 135 ... tens multiplied by ... is equal to ... tens. ...ones multiplied by ... is equal to ... ones. <i>E.g. I can partition 45 into 40 and 5. 40 times 3 equals 120 and 5 times 3 equals 15. When I add these total together I get 135 which is my answer.</i>	... tens multiplied by ... is equal to ... tens. ...ones multiplied by ... is equal to ... ones. <i>E.g. I can partition 45 into 40 and 5. 40 times 3 equals 120 and 5 times 3 equals 15. When I add these total together I get 135 which is my answer.</i>
Scaling Children focus on multiplication as scaling (... times the size) as opposed to repeated addition.	Various representations should be used to embed the concept of scaling.  There are ... times as many ... as ... <i>E.g. There are 3 times as many triangles as circles.</i>	Various representations should be used to embed the concept of scaling.  ... is ... times the size of is ... times the length/height of ... <i>E.g. Miss Smith is twice the height of Sam.</i>	

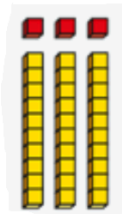
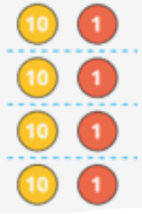
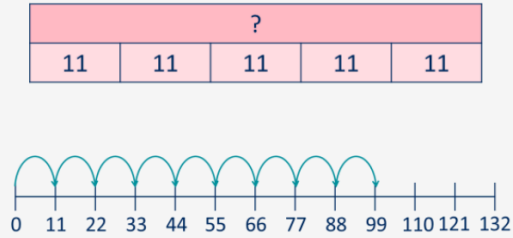
Multiplication



Year 3		Representations and sentence stems	
White Rose Objective	Concrete	Pictorial	Abstract
How many ways? Encourage children to work systematically to find all the different possible combinations. Children may notice that by multiplying the variables together, a total number of combinations can be found.			
	<i>E.g. for every hat, there are 2 scarves. There are 6 possibilities altogether.</i>	For every hat, there are two possible scarves. $3 \times 2 = 6$ There are 6 possibilities altogether.	For every ... , there are ... possible ... There are ... $\times$... possibilities altogether. There are ... possibilities altogether. <i>E.g. for every hat, there are 2 scarves. There are 3×2 possibilities altogether. There are 6 possibilities altogether.</i>

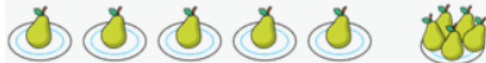
Multiplication



Year 4	Representations and sentence stems																																																																																																						
White Rose Objective	Concrete	Pictorial	Abstract																																																																																																				
Times-table facts to 12 × 12 [various objectives] Encourage daily counting in multiples both forwards and back. Encourage children to notice links between related times-tables.	Various representations should be used to embed conceptual understanding, including the vocabulary variations below. These are present in the White Rose planning as well as the Number Sense conceptual sessions. ... groups of 11 = ... × 11 = 11, ... times = 11 × ... = ... times 11 is equal to ... 4 × 11 = 44 44 = 4 × 11																																																																																																						
	   <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
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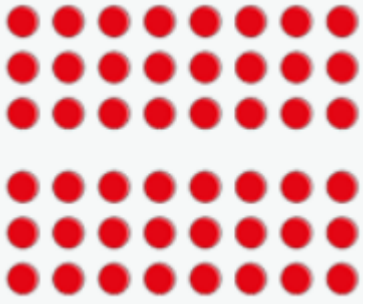
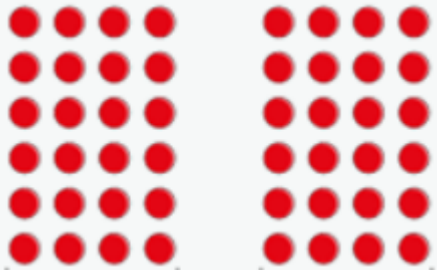
Multiplication



Year 4	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
	Start with using 'groups', e.g. 4 groups of 11 equals 44. Then progress on to using 'times', e.g. 4 times 11 equals 44.		
Multiply by 1 and 0			... X ... = ...
			
	Any number multiplied by 1 is equal to ... <i>E.g. Any number multiplied by 1 is equal to itself.</i> Any number multiplied by 0 is equal to ... <i>E.g. Any number multiplied by 0 is equal to 0.</i>		$1 \times 1 = 1$ $2 \times 1 = 2$ $3 \times 1 = 3$ $4 \times 1 = 4$ $1 \times 0 = 0$ $2 \times 0 = 0$ $3 \times 0 = 0$ $4 \times 0 = 0$
Multiply three numbers Children use their understanding of commutativity to multiply more efficiently.	A visual representation such as the one below can be used to demonstrate commutativity.		

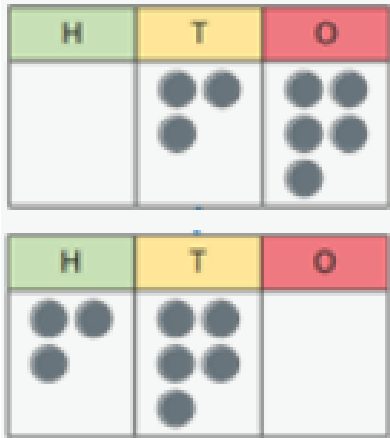
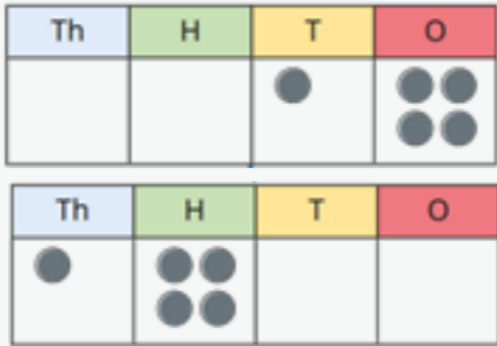
Multiplication



Year 4			
Representations and sentence stems			
White Rose Objective	Concrete	Pictorial	Abstract
	 $4 \times 2 \times 3 = 8 \times 3 = 24$ $2 \times 3 \times 4 = 6 \times 4 = 24$ $3 \times 4 \times 2 = 12 \times 2 = 24$		
	To work out $\dots \times \dots \times \dots$, I can first calculate $\dots \times \dots$ and then multiply the answer by ... <i>E.g. $4 \times 2 \times 3 = \dots$ $4 \times 2 = 8$ then $8 \times 3 = 24$.</i>		
Factor pairs Children explore equivalent calculations using different factors pairs.	 $8 \times 6 = 8 \times 3 \times 2$ $8 \times 6 = 24 \times 2$	 $6 \times 8 = 6 \times 4 \times 2$ $6 \times 8 = 24 \times 2$	
	$12 = \dots \times \dots$, so $\dots \times 12 = \dots \times \dots \times \dots$		

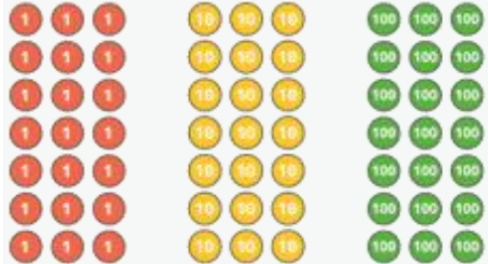
Multiplication



Year 4			
Representations and sentence stems			
White Rose Objective	Concrete	Pictorial	Abstract
Multiply by 10; Multiply by 100 Some children may overgeneralise that multiplying by 10 or 100 always results in adding zeros. This will cause issues later when multiplying decimals.	 $35 \times 10 = 350$	 $14 \times 100 = 1,400$	
	When I multiply by 10, the digits move ... place value column to the left. ... is 10 times the size of ... <i>E.g. When I multiply by 10, the digits move 1 place value column to the left. 350 is 10 times the size of 35.</i>	When I multiply by 100, the digits move ... place value columns to the left. ... is 100 times the size of ... <i>E.g. When I multiply by 100, the digits move 2 place value columns to the left. 1,400 is 100 times the size of 14.</i>	

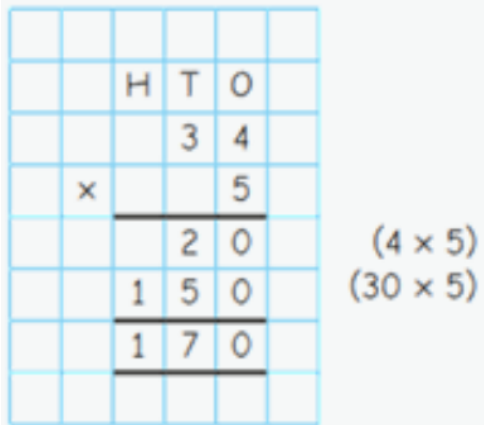
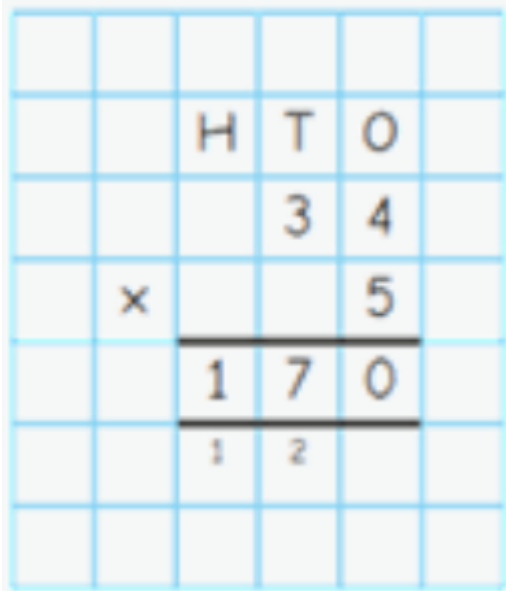
Multiplication



Year 4			
Representations and sentence stems			
White Rose Objective	Concrete	Pictorial	Abstract
Related facts - multiplication and division Use knowledge of multiplying by 10 and 100 to scale times-table facts.		$3 \times 7 = 21$ $3 \times 70 = 210$ $3 \times 700 = 2,100$	
	... $\times$... ones is equal to ... ones so ... $\times$... tens is equal to ... tens and ... $\times$... hundreds is equal to ... hundreds. <i>E.g. 3×7 ones is equal to 21 ones so 3×7 tens is equal to 21 tens and 3×7 hundreds is equal to 21 hundreds.</i>	... $\times$... ones is equal to ... ones so ... $\times$... tens is equal to ... tens and ... $\times$... hundreds is equal to ... hundreds. <i>E.g. 3×7 ones is equal to 21 ones so 3×7 tens is equal to 21 tens and 3×7 hundreds is equal to 21 hundreds.</i>	

Multiplication



Year 4			
Representations and sentence stems			
White Rose Objective	Concrete	Pictorial	Abstract
Multiply a 2-digit number by a 1-digit number; Multiply a 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 ... <i>E.g. To multiply 34 by 5, I first need to multiply 4 by 5. I then multiply 30 by 5. I</i>	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 ... <i>E.g. To multiply 34 by 5, I first need to multiply 4 by 5. I then multiply 30 by 5. I add the products together to give me the answer.</i>	

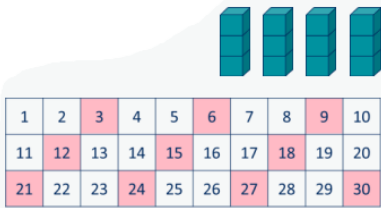
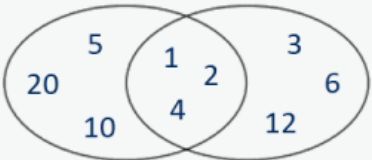
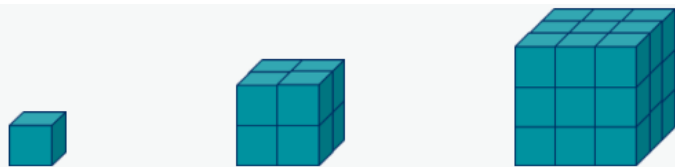
Multiplication



Year 4		Representations and sentence stems																										
White Rose Objective	Concrete	Pictorial		Abstract																								
	<i>add the products together to give me the answer.</i>																											
Scaling [no standalone objective but seen in reasoning problems in this unit] Children focus on multiplication as scaling (... times the size).	Various representations should be used to embed the concept of scaling.																											
	7 7 7 7 7 7 7 A computer mouse costs £7. A keyboard costs 6 times as much.		6 6 6 6 6 6 6 6 A red ribbon is 6 cm. A yellow ribbon is 7 times as long.																									
	... is ... times the size of ...																											
Correspondence problems Encourage children to use tables to show all the different possible combinations. They should work logically while also being aware of being able to multiply the number of variables together to show the total number of possibilities.	<table><tr><td></td><td>Deep pan</td><td>Italian</td><td>Thin</td></tr><tr><td>Cheese</td><td>C DP</td><td>C I</td><td>C Th</td></tr><tr><td>Mushroom</td><td>M DP</td><td>M I</td><td>M Th</td></tr><tr><td>Vegetable</td><td>V DP</td><td>V I</td><td>V Th</td></tr><tr><td>Chicken</td><td>C DP</td><td>C I</td><td>C Th</td></tr><tr><td>Tuna</td><td>T DP</td><td>T I</td><td>T Th</td></tr></table>					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
		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																									
	For every ... , there are ... possibilities. There are ... × ... possibilities altogether. <i>E.g. A pizza company offers a choice of 5 toppings and 3 bases.</i> $5 \times 3 = 15$																											

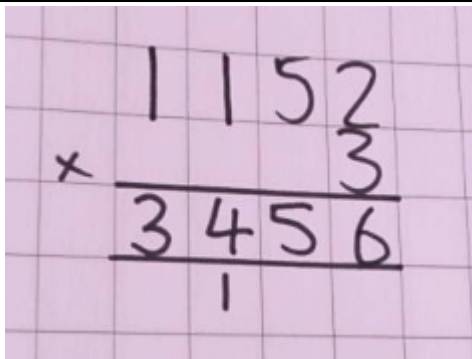
Multiplication



Year 5			
Representations and sentence stems			
White Rose Objective	Concrete	Pictorial	Abstract
Multiples; Factors Encourage children to notice patterns and make links with known facts.		 1×8  2×4 1, 2, 4 and 8 are factors of 8	Factors of 20 Factors of 12 
	... is a multiple of ... because ... $\times$... = ... <i>E.g. 3 is a multiple of 21 because $3 \times 7 = 21$.</i>	... is a factor of ... because ... $\times$... = ... <i>E.g. 2 is a factor of 8 because $2 \times 4 = 8$.</i>	The common factors of ... and ... are ... <i>E.g. The common factors of 20 and 12 are 1, 2 and 4.</i>
Square numbers; Cube numbers	 1×1 2×2 3×3 4×4 $1^2 = 1$ $2^2 = 4$ $3^2 = 9$ $4^2 = 16$	 $1 \times 1 \times 1$ $2 \times 2 \times 2$ $3 \times 3 \times 3$ $1^3 = 1$ $2^3 = 8$ $3^3 = 27$	
	... squared means ... $\times$...	... cubed means ... $\times$... $\times$...	

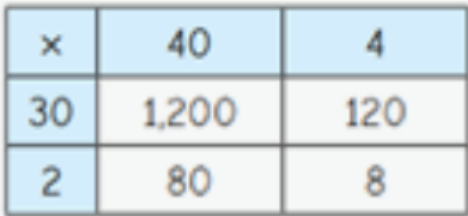
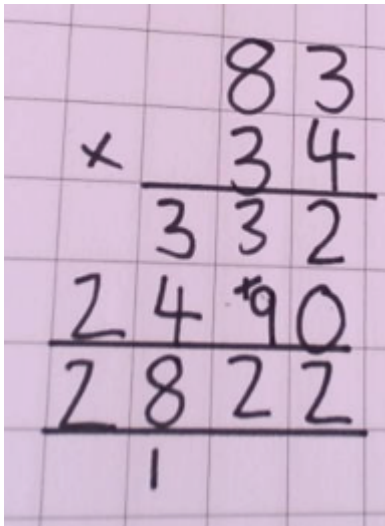
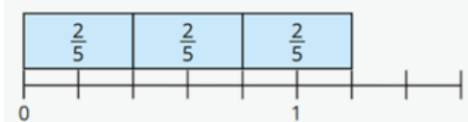
Multiplication



Year 5		Representations and sentence stems																																	
White Rose Objective	Concrete	Pictorial			Abstract																														
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.	<table border="1"><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> $234 \times 10 = 2,340$ $234 \times 100 = 23,400$ $234 \times 1,000 = 234,000$	M	HTh	TTh	Th	H	T	O					●●	●●●	●●●●	<table border="1"><tr><td>Th</td><td>H</td><td>T</td><td>O</td><td>●</td><td>Tth</td><td>Hth</td></tr><tr><td></td><td></td><td></td><td>●●●</td><td>●</td><td>●●●●</td><td>●●●●</td></tr></table> $2.34 \times 10 = 23.4$ $2.34 \times 100 = 234$ $2.34 \times 1,000 = 2,340$			Th	H	T	O	●	Tth	Hth				●●●	●	●●●●	●●●●			
M	HTh	TTh	Th	H	T	O																													
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			●●●	●	●●●●	●●●●																													
	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 ... <i>E.g. When I multiply by 10, the digits move 1 place value column to the left. 23.4 is 10 times the size of 2.34.</i>																																		
Multiply up to a 4-digit number 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 tens by ... , the hundreds by ... and the thousands by ... <i>E.g. To multiply 1152 by 3, I first need to multiply 2 ones by 3, then 5 tens by 3, then 1 hundred by 3 and finally 1 thousand by 3.</i>																																		

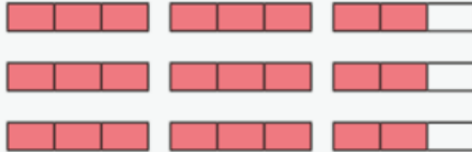
Multiplication



Year 5	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
Multiply numbers up to 4 digits by a 2-digit number Long multiplication is introduced for the first time.			
	I can partition ... into ... and ...	First, I multiply by the ... Then I multiply by the ... <i>E.g. First I multiply by the ones column of my 2-digit number. Then I multiply by the tens column, remembering to add in my place value holder.</i>	
Multiply a unit fraction by an integer; Multiply a non-unit fraction by an integer Make links with repeated addition. E.g. $\frac{1}{5} \times 4 = \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5}$	Fraction blocks can be used to support this concept.	$\frac{2}{5} \times 3 = \frac{6}{5} = 1 \frac{1}{5}$ 	$\frac{2}{5} \times 3 = \frac{6}{5} = 1 \frac{1}{5}$

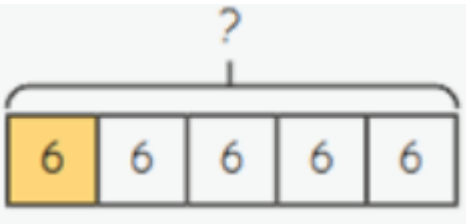
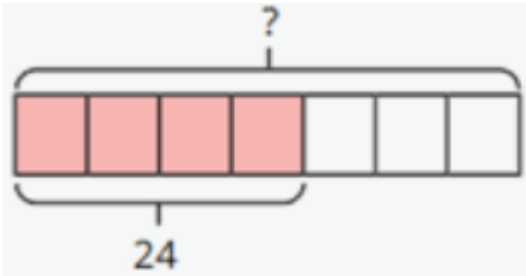
Multiplication



Year 5	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
	 $\frac{2}{5} \times 3 = \frac{6}{5} = 1 \frac{1}{5}$		
	To multiply a fraction by an integer, I multiply the numerator by the integer and the denominator remains the same. <i>E.g. To multiply $\frac{2}{5}$ by 3, I multiply 2 by 3. The denominator stays the same.</i>		
Multiply a mixed number by an integer	I can partition  into  and 		
		$2 \frac{2}{3} \times 3$ $2 \times 3 = 6$ $\frac{2}{3} \times 3 = \frac{6}{3} = 2$ $6 + 2 = 8$	
Find the whole Children multiply to find the whole from a given part.	$\frac{1}{5} \text{ of } \underline{\quad} = 6$ $5 \times 6 = 30$ $\frac{1}{5} \text{ of } 30 = 6$		Bar models should be used as follows for these calculations until the children have a deeper conceptual understanding of this kind of calculation.

Multiplication



Year 5	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
		$\frac{4}{7}$ of _ = 24  $\frac{1}{7} = 24 \div 4 = 6$ $7 \times 6 = 42$ $\frac{4}{7}$ of 42 = 24	
	If $\frac{1}{7}$ is ... , then the whole is ... $\times$...	If  is ... , then $\frac{1}{7}$ is ... and the whole is ... $\times$...	

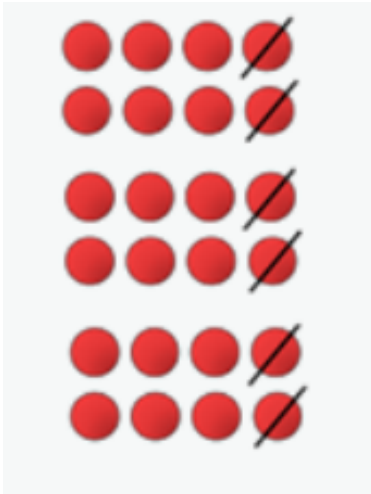
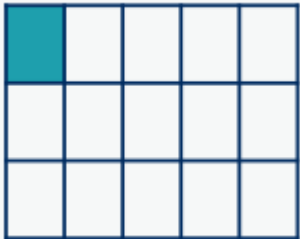
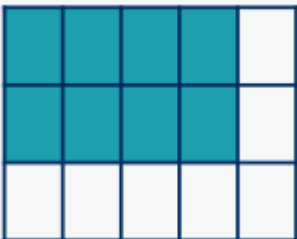
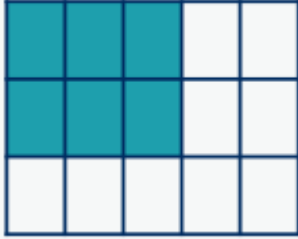
Multiplication



Year 6	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
Multiply up to a 4-digit number 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.		
Order of operations Children learn the order of priority for operations in a calculation. Calculations in brackets should be done First before moving on to indices. Multiplication and division should be performed before addition and subtraction.	The acronym BIDMAS can be used for children to identify the order of operations.		

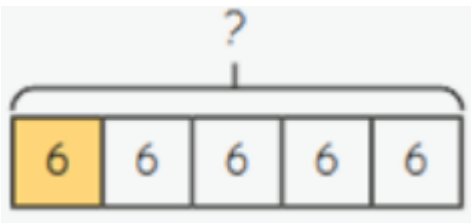
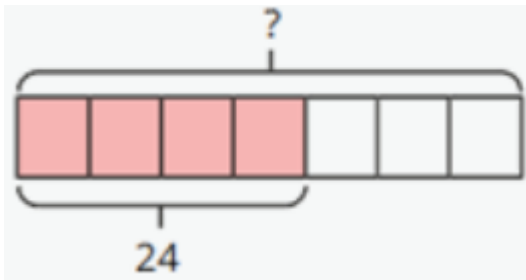
Multiplication



Year 6	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
	Brackets  Indices  Divide  Multiply  Add  Subtract 	 $(8 - 2) \times 3 = 18$	
	... has greater priority than ..., so the first part of the calculation I need to do is ... <i>E.g. I need to carry out the part of the calculation in brackets first which is 6. This can then be multiplied by 6. The answer is 18.</i>		
Multiply fractions by fractions Encourage children to give answers in their simplest form.	 $\frac{1}{3} \times \frac{1}{5} = \frac{1}{15}$	 $\frac{2}{3} \times \frac{4}{5} = \frac{8}{15}$	 $\frac{2}{3} \times \frac{3}{5} = \frac{6}{15} = \frac{2}{5}$

Multiplication



Year 6	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
	When multiplying a pair of fractions, I need to multiply the numerator and multiply the denominator.		
Fractions of amounts - find the whole Children multiply to find the whole from a given part.	$\frac{1}{5}$ of $_ = 6$ $5 \times 6 = 30$ $\frac{1}{5}$ of $30 = 6$ 	Bar models should be used as follows for these calculations until the children have a deeper conceptual understanding of this kind of calculation. $\frac{4}{7}$ of $_ = 24$ 	$\frac{1}{7} = 24 \div 4 = 6$ $7 \times 6 = 42$ $\frac{4}{7}$ of 42 = 24

Multiplication



Year 6	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
	$\frac{1}{\quad}$ If $\frac{1}{\quad}$ is ... , then the whole is ... $\times$...	If $\frac{\quad}{\quad}$ is ... , then $\frac{1}{\quad}$ is ... and the whole is ... $\times$...	
Ratio problems 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.	Multiple representations should be used to secure children’s conceptual understanding of calculations involving ratio.		
	For every 1 adult on the school trip, there are 6 children. adults children The ratio of adults to children is 1 : 6	Adults Children 1 6 2 12 3 18 0 1 2 3 4 5 6 0 6 12 18	
	For every ... , there are ...		

Multiplication



Year 6		Representations and sentence stems			
White Rose Objective	Concrete	Pictorial		Abstract	
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.	1 1 1 1 1 1 0.1 0.1 0.1 0.1 0.1 0.1 $6 \times 2 = 12$$6 \times 0.2 = 1.2$				
	I know that ... $\times$... = ..., so I also know that ... $\times$... = ... <i>E.g. I know that $6 \times 2 = 12$ so I also know that $6 \times 0.2 = 1.2$.</i>	I need to exchange 10 ... for 1 ...			
Calculate percentages Children first learn how to find 1%, 10%, 20%, 25% and 50% before using multiples of these amounts to find any percentage.	100% 50% 50% 25% 25% 25% 25%				
	100% 10% 10% 10% 10% 10% 10% 10% 10% 10% 10%				
	Find 32% of 400.				

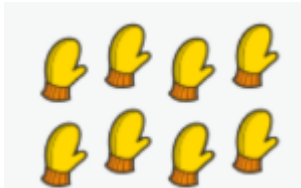
Multiplication



Year 6	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
	$1\% \text{ of } 400 = 4$ $10\% \text{ of } 400 = 40$ $20\% = 80$ $25\% = 100$ $50\% = 200$ $\text{So } 32\% \text{ of } 400 = 40 \times 3 = 120$ $4 \times 2 = 8$ $120 + 8 = 128$		

Division



Year 1	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
Make equal groups - grouping Encourage children to physically move objects into equal groups. They can also circle equal groups when using pictures	Various representations including the following:  There are ... altogether. How many groups of ... can you make?	Various representations including the following:  Circle groups of 2 There are ... groups of 2	 Take ... cubes. Make equal groups.
Make equal groups – sharing Encourage children to check that the objects have been shared fairly and each group is the same.	Various representations including the following:  ... have been shared equally between... There are ... on/in each ...	Various representations including the following:  Take ... cubes. Share them between ... 12 shared between ... is ...	
Find a half Start with practical	Various representations including the following:	Various representations including the following:	Various representations including the following:

Division



Year 1			
Representations and sentence stems			
White Rose Objective	Concrete	Pictorial	Abstract
opportunities to share a quantity into 2 groups. Progress to circling half of the objects in a picture and then to finding the whole from a given half.			
	To find half, I need to share into 2 equal groups. There are ... in each group.	Half of ... is ...	If ... is half, what is the whole? ... is half of ...
Find a quarter Start with practical opportunities to share a quantity into 4 groups. Progress to using pictures or bar models to find a quarter and then to finding the whole from a given quarter.	Various representations including the following:	Various representations including the following:	Various representations including the following:
	To find a quarter, I need to share into 4 equal groups.	A quarter of ... is ...	If ... is one quarter, what is the whole? ... is one quarter of ...

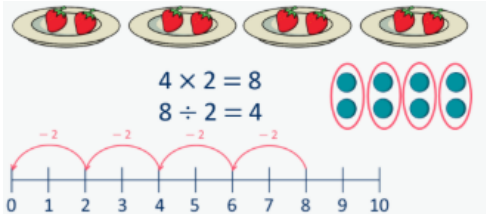
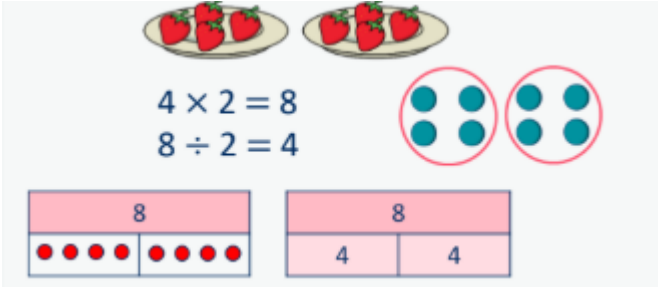
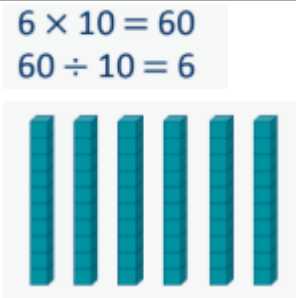
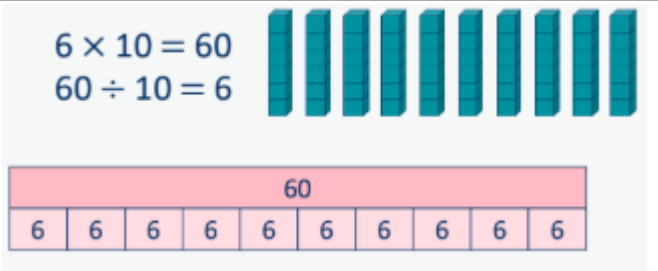
Division



Year 1	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
	There are ... in each group.		

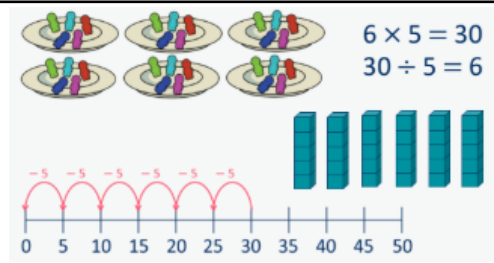
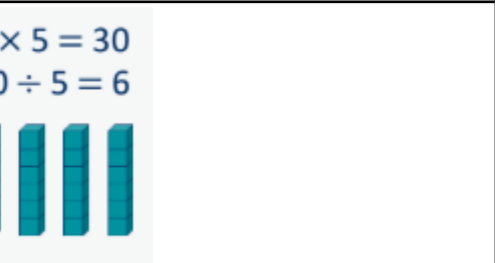
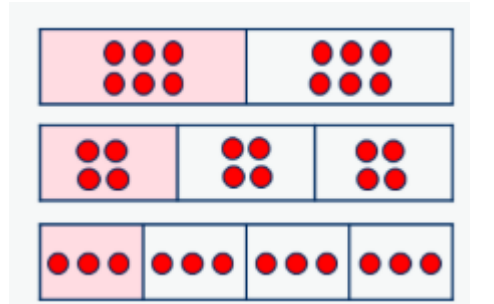
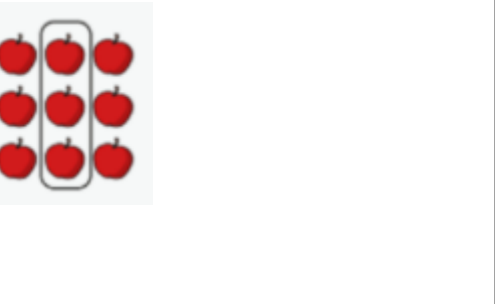
Division



Year 2			
Representations and sentence stems			
White Rose Objective	Concrete	Pictorial	Abstract
Divide by 2 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts and halving.	 $4 \times 2 = 8$ $8 \div 2 = 4$ There are ... equal groups of 2 $\dots \div 2 = \dots$	 $4 \times 2 = 8$ $8 \div 2 = 4$ There are ... equal groups of 2 $\dots \div 2 = \dots$	
Divide by 10 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	 $6 \times 10 = 60$ $60 \div 10 = 6$ There are ... equal groups of 10 $\dots \div 10 = \dots$	 $6 \times 10 = 60$ $60 \div 10 = 6$... shared equally between 10 is ... $\dots \div 10 = \dots$	

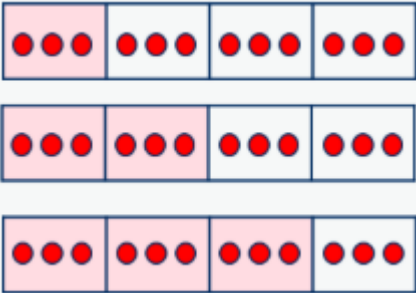
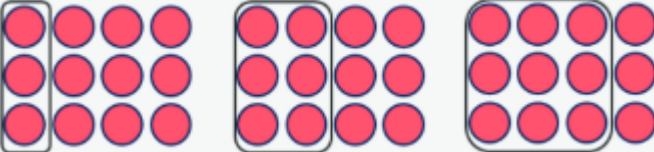
Division



Year 2		Representations and sentence stems	
White Rose Objective	Concrete	Pictorial	Abstract
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 $\dots \div 5 = \dots$	 ... shared equally between is ... $\dots \div 5 = \dots$	
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. $\frac{1}{\dots}$ of ... is ...	 There are ... equal parts. There is ... part circled. $\frac{1}{\dots}$ is circled.	

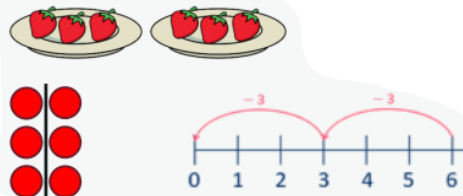
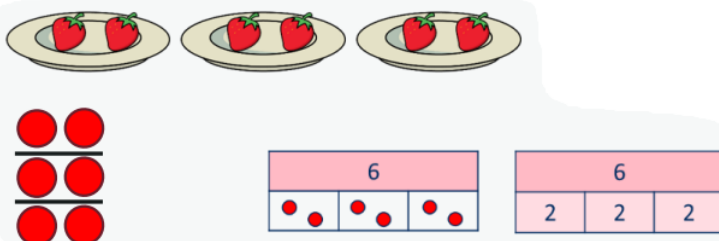
Division



Year 2	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
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. $\frac{\dots}{\dots}$ $\frac{\dots}{\dots}$ of ... is ...	There are ... equal parts. There are ... parts circled. $\frac{\dots}{\dots}$ is circled.	

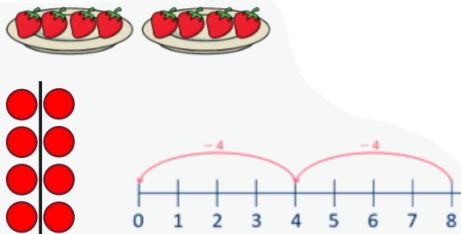
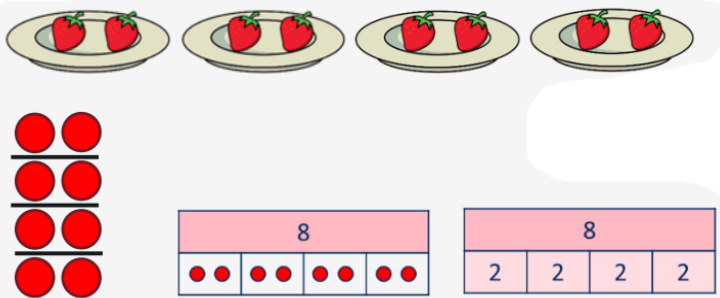
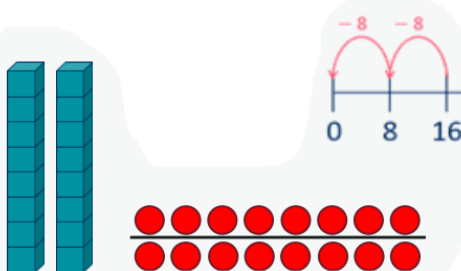
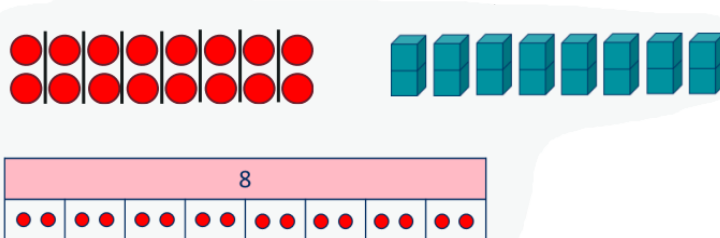
Division



Year 3	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
Divide by 3 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	Various representations should be used to embed conceptual understanding, including the vocabulary variations below. These are present in the White Rose planning as well as the Number Sense conceptual sessions.		
	 $2 \times 3 = 6$ $6 \div 3 = 2$	 $2 \times 3 = 6$ $6 \div 3 = 2$	
	There are ... groups of 3 in $\div 3 =$	... has been shared equally into 3 equal groups. ... $\div 3 =$	
Divide by 4 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	Various representations should be used to embed conceptual understanding, including the vocabulary variations below. These are present in the White Rose planning as well as the Number Sense conceptual sessions.		

Division



Year 3	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
	 $2 \times 4 = 8$	 $2 \times 4 = 8$ $8 \div 4 = 2$	
	There are ... groups of 4 in $\div 4 =$	... has been shared equally into 4 equal groups. ... $\div 4 =$	
Divide by 8 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	Various representations should be used to embed conceptual understanding, including the vocabulary variations below. These are present in the White Rose planning as well as the Number Sense conceptual sessions.		
	 $2 \times 8 = 16$	 $2 \times 8 = 16$	

Division



Year 3	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
	$16 \div 8 = 2$	$16 \div 8 = 2$	
	There are ... groups of 8 in ... $\dots \div 8 =$	... has been shared equally into 8 equal groups. $\dots \div 8 =$	
Related calculations Link to known times-table facts.	1 1 1 1 1 1 1 1 1 1 1 1 10 10 10 10 10 10 10 10 10 10 10 10 $12 \div 3 = 4$ $120 \div 3 = 40$... $\div$... is equal to ..., so ... tens $\div$... is equal to ... tens. <i>E.g. I know that $12 \div 3 = 4$ so I also know that $120 \div 3 = 40$.</i>		

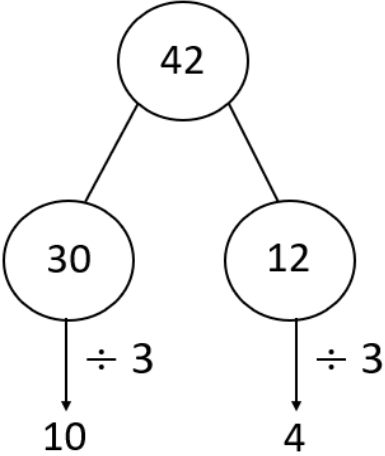
Division



Year 3	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
Divide a 2-digit number by a 1-digit number - no exchange Partition into tens and ones to divide and then recombine.	Tens Ones $60 \div 2 = 30$ $4 \div 2 = 2$ $64 \div 2 = 32$	$48 \div 4 = 12$	
	... tens divided by ... is equal to ... tens. ... ones divided by ... is equal to ... ones.	... tens divided by ... is equal to ... tens. ... ones divided by ... is equal to ... ones.	

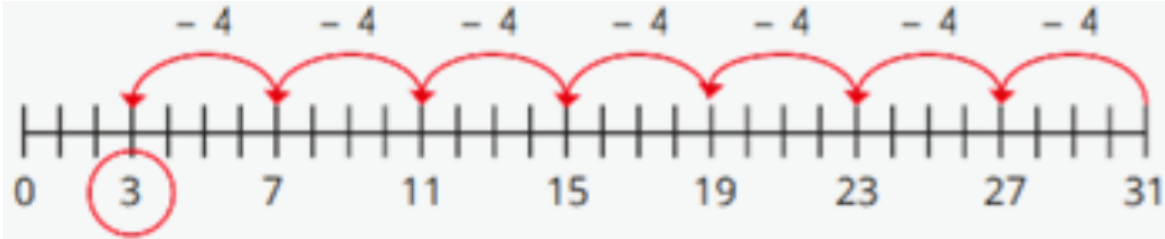
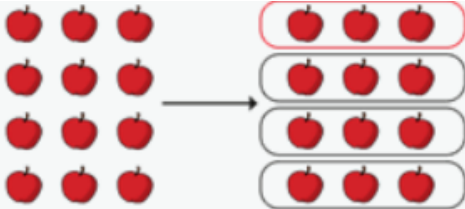
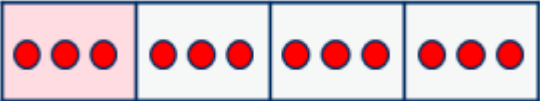
Division



Year 3	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
Divide a 2-digit number by a 1-digit number - flexible partitioning Partition into tens and ones to divide and then recombine.	 $80 \div 4 = 20$ $16 \div 4 = 4$ $96 \div 4 = 24$	$42 \div 3 = 14$  $10 + 4 = 14$	
	... tens divided by ... is equal to ... tens. ... ones divided by ... is equal to ... ones.	... tens divided by ... is equal to ... tens. ... ones divided by ... is equal to ... ones.	

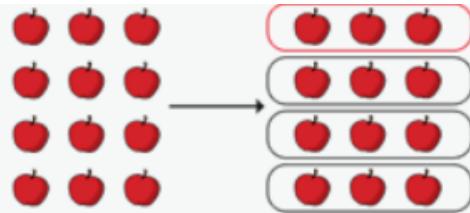
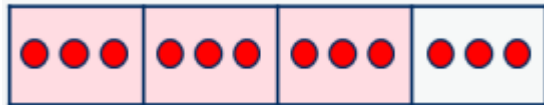
Division



Year 3	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
Divide a 2-digit number by a 1-digit number - with remainders	 $31 \div 4 = 7 \text{ r}3$ There are ... groups of ... There are ... remaining.		
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.	Various representations should be used to embed the concept of dividing a whole into equal parts. Note that dividing the whole by the denominator and multiplying by the numerator is explicitly taught in Year 5. Noticing this method is fine but physical and visual representations should be prioritised in explicit teaching.  $\frac{1}{4}$ of 12 apples is 3 apples.  $\frac{1}{4}$ of 12 is 3  $\frac{1}{3}$ of 36 is 12		

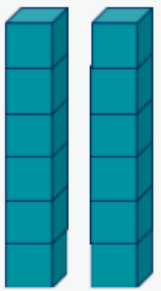
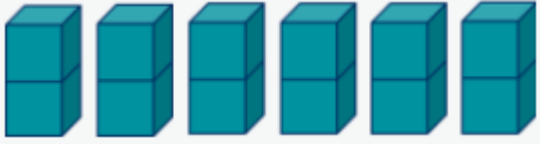
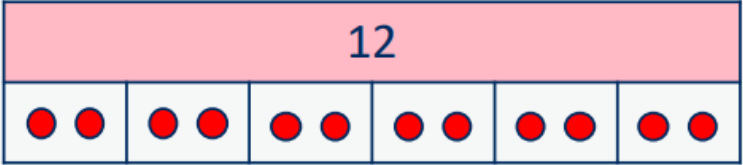
Division



Year 3	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
	The whole is divided into ... equal parts. Each part is $\frac{1}{\quad}$ of the whole.	One ... of ... is ...	
Non-unit fractions of a set of objects	Various representations should be used to embed the concept of dividing a whole into equal parts.		
	Note that dividing the whole by the denominator and multiplying by the numerator is explicitly taught in Year 5. Noticing this method is fine but physical and visual representations should be prioritised in explicit teaching.		
	 $\frac{3}{4}$ of 12 apples is 9 apples.	 $\frac{3}{4}$ of 12 is 9.	 $\frac{2}{3}$ of 36 is 24.
	The whole is divided into ... equal parts. Each part is $\frac{1}{\quad}$ of the whole.	$\frac{1}{\quad}$ of of ... is ..., so $\frac{\quad}{\quad}$ of ... is ... <i>E.g. $\frac{1}{4}$ of 12 is 3 so $\frac{3}{4}$ of 12 is 9.</i>	

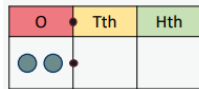
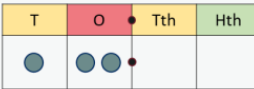
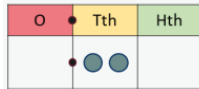
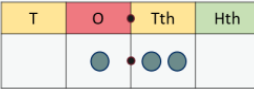
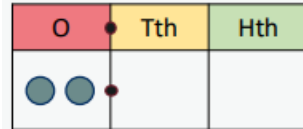
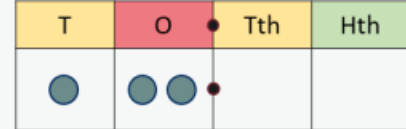
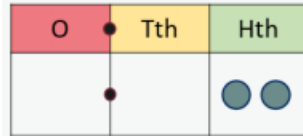
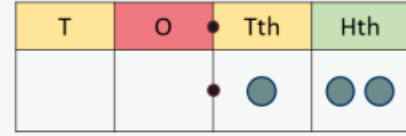
Division



Year 4	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
Division facts to 12 × 12 [various objectives] Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	Various representations should be used to embed conceptual understanding. These are present in the White Rose planning as well as the Number Sense conceptual sessions.		
	$2 \times 6 = 12$ $12 \div 6 = 2$   	$2 \times 6 = 12$ $12 \div 6 = 2$   	

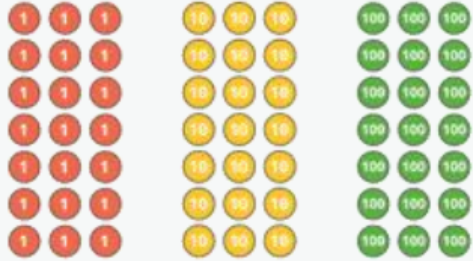
Division



Year 4			
Representations and sentence stems			
White Rose Objective	Concrete	Pictorial	Abstract
	There are ... groups of ... in ... $\dots \div \dots =$	... has been shared equally into ... equal groups. $\dots \div \dots =$	
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.	5 shared between 1 is 5 .  There are 5 groups of 1 in 5. 	5 shared between 5 is 1.  There is 1 group of 5 in 5. 	
	When I divide a number by 1, the number remains the same.	When I divide a number by itself, the answer is 1.	
Divide by 10; Divide by 100 Encourage children to notice that dividing by 100 is the same as dividing by 10 twice.	    $2 \div 10 = 0.2$ $12 \div 10 = 1.2$	    $2 \div 100 = 0.02$ $12 \div 100 = 0.12$	

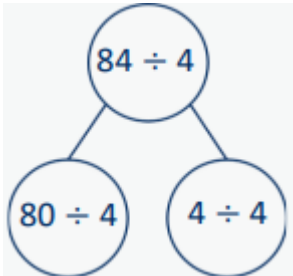
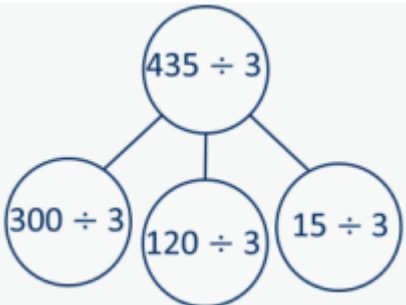
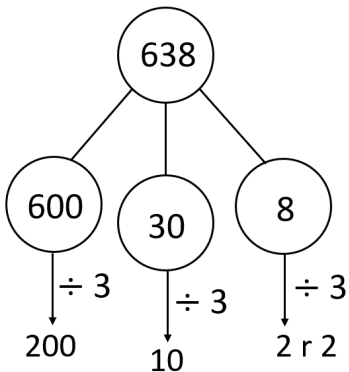
Division



Year 4			
Representations and sentence stems			
White Rose Objective	Concrete	Pictorial	Abstract
	When I divide by 10, the digits move 1 place value column to the right. ... is one-tenth the size of ... <i>E.g. 0.2 is one-tenth the size of 2.</i>	When I divide by 100, the digits move 2 place value columns to the right. ... is one-hundredth the size of ... <i>E.g. 0.02 is one-hundredth the size of 2.</i>	
Related facts - multiplication and division Link to known times-table facts.			
	$21 \div 7 = 3$ $210 \div 7 = 30$ $2,100 \div 7 = 300$	$21 \div 3 = 7$ $210 \div 3 = 70$ $2,100 \div 3 = 700$	
	... $\div$... is equal to ... so ... tens $\div$... is equal to ... tens and ... hundreds $\div$... is equal to ... hundreds <i>E.g. $21 \div 3$ is equal to 7 so 21 tens $\div$ 3 is equal to 7 tens and 21 hundreds $\div$ 3 is equal to 7 hundreds.</i>		
Divide a 2-digit number by a 1-digit number; Divide a	$84 \div 4 = 21$ [answer added once rest of calculation is completed]	$435 \div 3 = 145$ [answer added once rest of calculation is completed]	$638 \div 3 = 212 \text{ r } 2$ [answer added once rest of calculation is completed]

Division



Year 4			
Representations and sentence stems			
White Rose Objective	Concrete	Pictorial	Abstract
3-digit number by a 1-digit number Progress from divisions with no exchange, to divisions with exchange and then divisions with remainders.	 $80 \div 4 = 20$ $4 \div 4 = 1$ $20 + 1 = 21$	 $300 \div 3 = 100$ $120 \div 3 = 40$ $15 \div 3 = 5$ $100 + 40 + 5 = 145$ 	 $600 \div 3 = 200$ $30 \div 3 = 10$ $8 \div 3 = 2 \text{ r } 2$ $200 + 10 + 2 \text{ r } 2$
	I can partition ... into ... tens and ... ones <i>E.g. I can partition 84 into 8 tens and 4 ones.</i>	I cannot share the hundreds/tens equally, so I need to exchange 1 ... for 10 ... <i>E.g. I cannot share the hundreds equally, so I</i>	After sharing the hundreds, tens and ones equally by ..., there are ... tens/ones remaining.

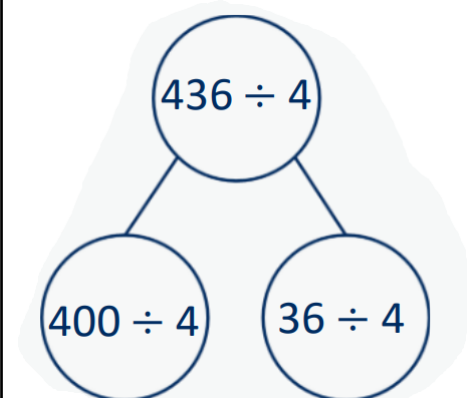
Division



Year 4	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
		<i>need to exchange 1 hundred for 10 tens.</i>	

Division



Year 5	Representations and sentence stems																										
White Rose Objective	Concrete	Pictorial	Abstract																								
Mental strategies These are two key strategies which can be used within other division objectives in Year 5.		$436 \div 4 = 436 \div 2 \div 2$ $436 \div 2 = 218$ $218 \div 2 = 109$																									
	I can partition ... into ... and ... to help me to divide more easily.	To divide by ..., I can divide by ... and then divide the result by ... <i>E.g. To divide by 4, I can divide by 2 then divide the result by 2.</i>																									
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.	<table border="1" data-bbox="607 1051 1301 1214"><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 border="1" data-bbox="607 1235 1301 1398"><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> $120 \div 10 = 12$			Th	H	T	O	Tth	Hth		●	● ●		●		Th	H	T	O	Tth	Hth			●	● ●	●	
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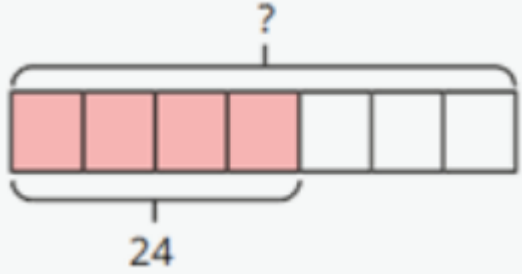
Division



Year 5	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
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Division



Year 5	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
to understand that to find a fraction of an amount, we divide by the denominator and multiply by the numerator.	$\frac{1}{5}$ of 20 = 4 $\frac{3}{5}$ of 20 = 12	$\frac{4}{7}$ of _ = 24  $\frac{1}{7} = 24 \div 4 = 6$ $7 \times 6 = 42$ $\frac{4}{7}$ of 42 = 24	
	To find $\frac{\quad}{\quad}$ of ... , I need to divide by ... and multiply by ...	If is ... , then $\frac{1}{\quad}$ is ... and the whole is ... $\times$...	

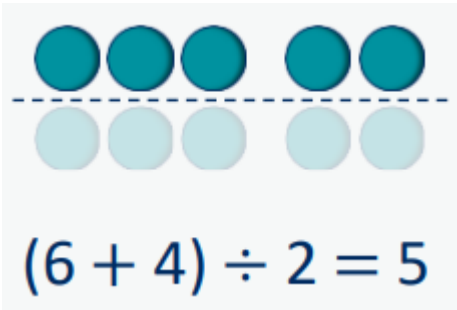
Division



Year 6	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
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 ...		
Introduction to long division; Long division with remainders The long division method is introduced for the first time. Two alternative methods are shown.			
Order of operations Children learn the order of	The acronym BIDMAS can be used for children to identify the order of operations.		

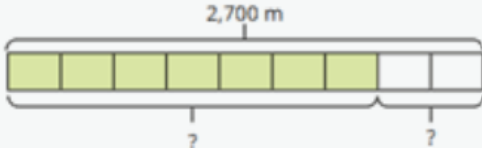
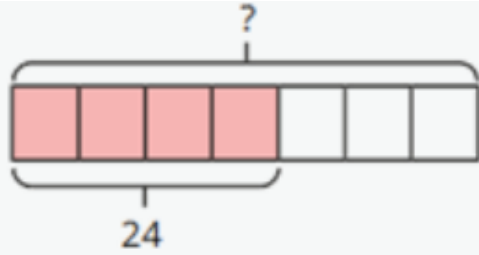
Division



Year 6	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
priority for operations in a calculation. Calculations in brackets should be done First before moving on to indices. Multiplication and division should be performed before addition and subtraction.	B rackets I ndices D ivide M ultiply A dd S ubtract  		
	... has greater priority than ..., so the first part of the calculation I need to do is ... <i>E.g. I need to carry out the part of the calculation in brackets first which is 10. This can then be divided by 2. The answer is 5.</i>		
Divide a fraction by an integer	1 1/2 1/2 1/4 1/4 1/4		

Division



Year 6	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
		$\text{so } \frac{2}{3} \div 4 = \frac{\overset{4}{2}}{6} \div 4 = \frac{1}{6}$	
	I am dividing by ... , so I can split each part into ... equal parts.	... is equivalent to ... so ... $\div$... = ... $\div$...	
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.	$\frac{1}{2}$ of 36 = $36 \div 2$ $\frac{1}{12}$ of 36 = $36 \div 12$	 $\frac{7}{9} \text{ of } 2700 = \frac{1}{9} \text{ of } 2700 \times 7$	Bar models should be used as follows for these calculations until the children have a deeper conceptual understanding of this kind of calculation. $\frac{4}{7} \text{ of } _ = 24$  $\frac{1}{7} = 24 \div 4 = 6$ $7 \times 6 = 42$

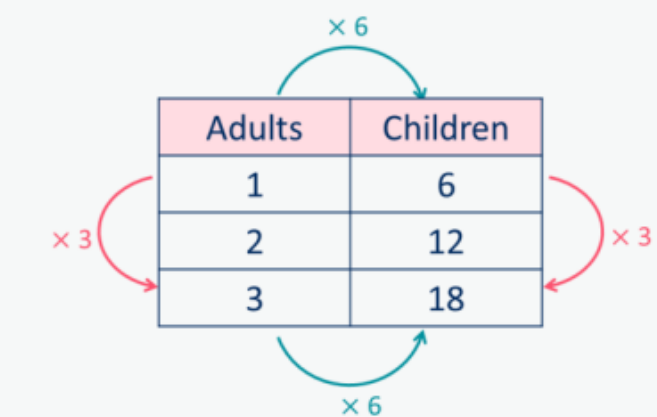
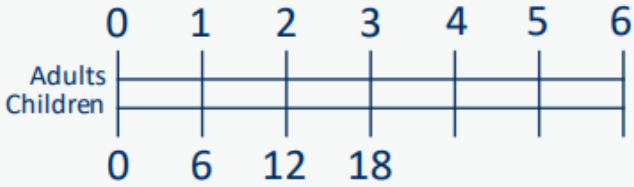
Division



Year 6	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
			$\frac{4}{7}$ of 42 = 24
	To find $\frac{1}{\quad}$ I divide by ...	If $\frac{1}{\quad}$ is equal to ..., then $\frac{\quad}{\quad}$ are equal to ...	If $\frac{\quad}{\quad}$ is ... , then $\frac{1}{\quad}$ is ... and the whole is ... $\times$...
Ratio problems 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.	Multiple representations should be used to secure children's conceptual understanding of calculations involving ratio.		

Division



Year 6	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
	For every 1 adult on the school trip, there are 6 children. adults  children  The ratio of adults to children is 1 : 6.		
	For every ... , there are ...		

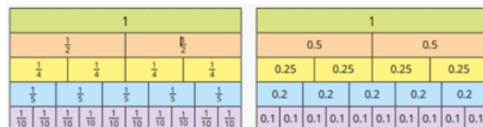
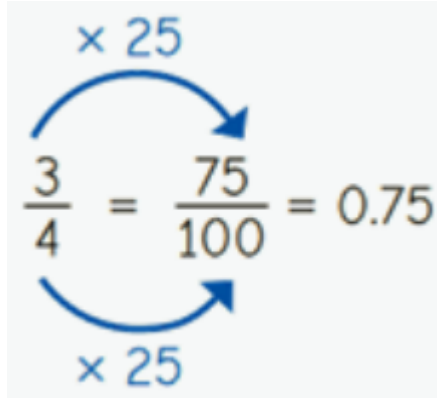
Division



Year 6	Representations and sentence stems		
White Rose Objective	Concrete	Pictorial	Abstract
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.	$312 \div 10 = 31.2$ $312 \div 100 = 3.12$ $312 \div 1,000 = 0.312$ To divide by ... , I move the digits ... places to the right. <i>E.g. 3.12 is one-hundredth the size of 312.</i>		
Divide decimals by integers This is the first time children divide decimals by numbers other than 10, 100 or 1,000.	$39 \div 3 = 13$ $3.9 \div 3 = 1.3$ $0.39 \div 3 = 0.13$		
	I know that ... ÷ ... = ..., so I also know that ... ÷ ... = ...		I need to exchange 1 ... for 10 ...

Division



Year 6		Representations and sentence stems	
White Rose Objective	Concrete	Pictorial	Abstract
Decimal and fraction equivalents Fraction blocks with decimal equivalents should be used initially along with fraction walls. Children should then progress onto converting the fraction to hundredths.	Fraction blocks with decimal equivalents should be used initially along with fraction walls.   $\frac{1}{5} = 0.2$ $\frac{2}{5} = 0.4$ $\frac{3}{5} = 0.6$		
	The fraction ... is equivalent to the decimal ...		
Understand percentages Children first learn how to find 1%, 10%, 20%, 25% and 50% before using multiples of these	Find 32% of 400. 1% of 400 = 4 10% of 400 = 40		

Division



Year 6	Representations and sentence stems																																																										
White Rose Objective	Concrete				Pictorial				Abstract																																																		
amounts to find any percentage.	20% = 80 25% = 100 50% = 200																																																										
	So 32% of 400 = 40 x 3 = 120 4 x 2 = 8 120 + 8 = 128																																																										
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