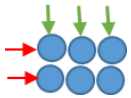
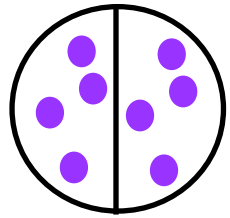
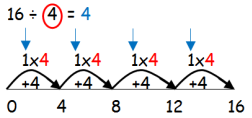
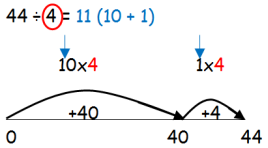
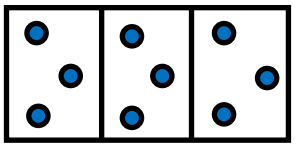
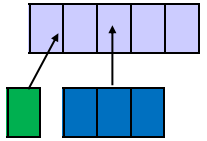
Calculation Policy

End of Year Expectation	Addition	Subtraction	Multiplication	Division	Fractions
Year 1	**Mental methods** linked to splitting numbers below ten: 5 and 3 make 8, 3 and 5 make 8, 8 take away 3 is 5, 8 take away 5 is 3. Use number facts to add to ten 5 + 7 = (5, 2) 4 + 8 = (6, 2) Create scaffold so: 5 + 5 = 10 + 2 = 12 4 + 6 = 10 + 2 = 12 **1 digit to a 2 digit:** Use same as above 5 + 3 = 8 15 + 3 = 18 **2 digit to a 2 digit:** **Partitioning:** 12 + 15 = 2 + 5 = 07 10 + 10 = 20 27	Take away physical items, find the difference by counting up and counting back (especially within 10). **Mental methods** linked to splitting numbers below ten: 5 and 3 make 8, 3 and 5 make 8, 8 take away 3 is 5, 8 take away 5 is 3. **2 digit subtract a 1 digit:** Use same as above 5 - 3 = 2 15 - 3 = 12 **Number splitting** to bridge 10 15 - 8 = (5, 3) 15 - 5 = 10 10 - 3 = 7 ***Numberline*** 15 – (8) = 7 -1 -1 -1 -1 -1 -1 -1 -1 7 8 9 10 11 12 13 14 15 Start at number 15, circle number being subtracted. Begin with blocks, take 1 away & draw jump. Repeat until all blocks have been taken away.	**Grouping** with link to repeated addition 2 + 2 + 2 = 6 3 groups of/lots of/x 2 Move onto array: 3 x 2 = 6 	**Equal sharing**: 8 ÷ 2 8 shared equally into 2 groups **Inverse of multiplication**: 8 shared into groups of 2 Practical and **visual** image.	Begin with a variety of paper simple shapes (circle, square, rectangle), fold in half and quarters. Colour half, quarter. MUST BE EQUAL PARTS When finding halves and quarters of amounts, refer to half and quarter of shapes and demonstrate sharing between parts of the shape.  $\frac{1}{2}$ of 8 = 4

Calculation Policy

End of Year Expectation	Addition	Subtraction	Multiplication	Division	Fractions
Year 2	**2 digit to a 2 digit: Partitioning:** 12 + 15 = 2 + 5 = 07 10 + 10 = 20 27 **Formal columnar method - Correct language is crucial!** Two plus five equals seven. One TEN plus one TEN equals 2 TENS equals twenty. TO 1 2 + 1 5 2 7 **Progressing onto formal columnar method** to include carrying with numbers up to 3 digits **7 8 9** **+ 6 4 2** **1 4 3 1** 1 1 Answer: 1431	**Mental Method - Partitioning strategy** 54 - 32 = Partition 2nd number 54 - 32 = 30 2 54 - 30 = 24 24 - 2 = 22 **Formal columnar method - Correct language is crucial!** Four subtract two equals two. Five TENS subtract three TENS equals 2 TENS equals twenty. 5 4 - 3 2 2 2	Multiplying a 2 digit number by a single digit Partition 2 digit number, multiply out, add. 16 x 5 = 10 6 10 x 5 = 50 6 x 5 = 30 80	Numberline:  Progress onto larger jumps:  	When introducing fractions of amounts, recap fractions of shapes using paper. E.g. 2/3 of 9 Split shape into denominator. Share the amount of objects between the 3 parts. How many in each part? How many parts do you need (numerator)?  3 in each part 2 x 3 = 6 3 Link to repeated addition too. 3 + 3 + 3 = 6

End of Year Expectation	Addition	Subtraction	Multiplication	Division	Fractions

Year 3	**Formal columnar method** to include carrying with numbers up to 3 digits
	
	  7 8 9
	+ 6 4 2
	1 4 3 1
	1 1
	
	Answer: 1431
	
	EXT: Vary place value
		Formal columnar method to include numbers up to 3 digits
		
		  8 7 4
		– 5 2 3
		3 5 1
		
		Answer: 351
			Columnar method with 2 digit by 1 digit numbers using ( )
			
			24
			X 6
			24 (6x4)
			120 (6x20) carry 0 across then 6x2
			144
			
			EXT: numbers up to 3 digits then without brackets
				Children to use Formal short division method of 2 digits by 1 digit.
				
				4 2
				2 ⟌ 8 4
				
				EXT: 3 digits
					Use visual representation (same diagram)
					
					Adding: 1/5 + 3/5 = 4/5
					
					 
					Subtracting: 4/5 - 1/5 = 3/5

Year 4	**Formal columnar method** to include carrying, varying place value and decimals in the context of money for numbers up to 4 digits
	
	  3 7 2 1
	+ 4 3 9
	4 1 6 0
	1 1
		Formal columnar method to include borrowing, varying place value and decimals in the context of money for numbers up to 4 digits
		
		8 12 1
		9 3 2
		– 4 5 7
		4 7 5
		
		Answer: 475
			Columnar method without brackets to include multiplying 2 & 3 digits by 1 digit
			
			342 x 7 becomes
			
			  3 4 2
			× 7
			2 3 9 4
			2 1
			
			Answer: 2394
				Formal Short Division Method including 3 digit numbers by 1 digit
				
				486 ÷3 =
				
				1 6 2
				3 ⟌ 4 ¹8 6
				
				EXT: Remainders
				
				432 ÷ 5 becomes
				
				8 6 r2
				5 ⟌ 4 3 ³2
				
				Answer: 86 remainder 2
					Add and subtract fractions with the same denominator
					
					Adding: 1/5 + 3/5 = 4/5
					
					See images from year 3
					
					1. Add numerators
					
					2. Denominators remain same.
					
					Subtracting: 4/5 - 1/5 = 3/5
					
					See images from year 3
					
					1. Subtract numerators,
					2. Denominators remain same.

End of Year	Addition	Subtraction	Multiplication	Division	Fractions
Year 5	**Formal Columnar Method** to include carrying, varied place value, several numbers and decimals with numbers with more than 4 digits 5 3 1 0 7 + 8 4 6 5 6 1 5 7 2 1 1	**Formal columnar method** to include borrowing, varied place value and decimals with numbers with more than 4 digits. 4 1 8 1 5 3 1 9 3 - 8 1 6 5 4 5 0 2 8	**Columnar method** with 4 digit numbers by a 1 or 2 digit number 2 7 4 1 × 6 1 6 4 4 6 4 2 Answer: 16 446 124 × 26 becomes 1 2 1 2 4 × 2 6 7 4 4 2 4 8 0 3 2 2 4 1 1 Answer: 3224	**Short division method** with 4 digits by 1 digit, with remainders in context **486 ÷ 3 =** 1 6 2 5 r2 3 ⟌ 4 1 8 6 1	**Add & subtract fractions with same denominators or multiples of the same number.** **Add** $\frac{5}{8} + \frac{2}{8} = \frac{7}{8}$ **Subtract** $\frac{5}{8} - \frac{2}{8} = \frac{3}{8}$ **See images from Year 3** **For different denominators e.g. 2/3 + 1/6** 1. Convert fraction to same denominators by multiplying or dividing numerator & denominator by the same number. (Use images of equivalence) 2/3 x 2 = 4/6 2. Add/subtract as before. $\frac{4}{6} + \frac{1}{6} = \frac{5}{6}$ or $\frac{4}{6} - \frac{1}{6} = \frac{3}{6}$ **Multiply fractions and mixed numbers by whole number.** **Show the fraction visually—5 lots of 4/5** 4/5 x 5 = 1. Multiply whole number by numerator. 4 x 5 = 20 2. Denominator stays the same. $\frac{20}{5}$ Count the parts on the visual representation to prove there are 20 e.g slices of pizza. 3. Then simplify & convert to mixed number if needed. $\frac{20}{5} \div 5 = \frac{4}{1}$ or 4 wholes

Year 6

Formal columnar method to include carrying, varied place value, several numbers and decimals with numbers up to 1,000,000

2	3	4	5	6	7	1	●	6
1	9	2	1	6	0	3	●	5
4	2	6	7	2	7	5	●	1
1			1			1		

Formal columnar method to include borrowing, varied place value and decimals with numbers up to 1,000,000

1	1				6	1		
~~2~~	3	4	5	6	~~7~~	1	●	6
1	9	2	1	6	0	3	●	5
0	4	2	4	0	6	8	●	1

Columnar method with 4 digit by 2 digit numbers

124 x 26 becomes

	1	2	4
×		2	6
	7	4	4
2	4	8	0
3	2	2	4
1	1		

Answer: 3224

Short division method with 4 digits by 2 digits, with remainders as whole numbers, fractions or rounding as context

496 ÷ 11 becomes

		4	5	r 1
1	1	4	9	6
			5	

Answer: $45\frac{1}{11}$

Long division method

432 ÷ 15 becomes

		2	8	r 12
1	5	4	3	2
		3	0	0
		1	3	2
		1	2	0
			1	2

432 ÷ 15 becomes

		2	8	
1	5	4	3	2
		3	0	0
		1	3	2
		1	2	0
			1	2

15×20

15×8

$\frac{\cancel{12}}{\cancel{15}} = \frac{4}{5}$ Answer: $28\frac{4}{5}$

432 ÷ 15 becomes

		2	8 ·	8
1	5	4	3	2 · 0
		3	0	↓
		1	3	2
		1	2	0 ↓
			1	2 0
			1	2 0
				0

Answer: 28·8

Add & subtract fractions with different denominators and mixed numbers, using concept of equivalent fractions.

Add

1.Convert fractions to same denominator or mixed number to fraction (use equivalent images to support).

E.g. 2/3 + 1/6 =
2/3 x 2 = 4/6

E.g. 1 & 2/3 + 1/6 =
1whole = 3/3 + 2/3 = 5/3
5/3 x 2 = 10/6

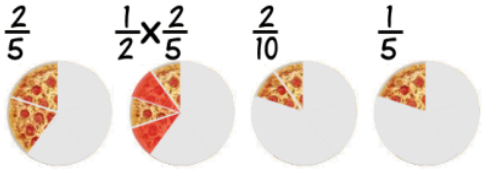
2. Add numerators, keep denominator the same.
3. Simplify if possible.

Subtract

1. Repeat step 1 above.
2. Subtract numerators, keep denominator the same.
3. Simplify if possible.

Multiply simple pairs of proper fractions, with answer in simplest form.

E.g.



1. Multiply numerators by each other.
2. Multiply denominators by each other.
3. Simplify if possible.

Divide proper fractions by whole numbers.

E.g.

1. Change ÷ to x.
2. Multiply denominator by whole number.
2. Simplify if possible.