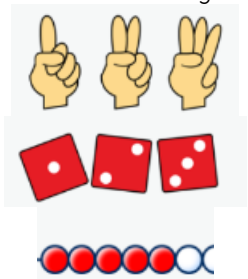
Sacred Heart Catholic Voluntary Academy

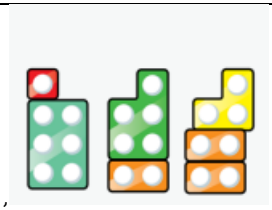
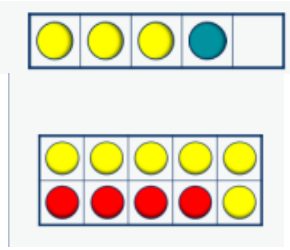
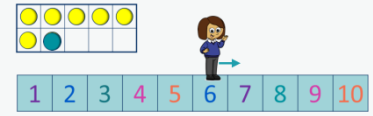
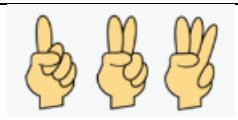
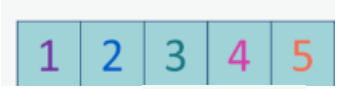
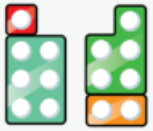
Calculation Policy – Progression of skills in Calculation.

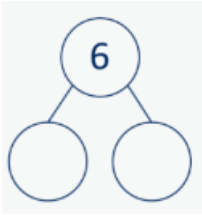
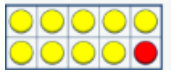
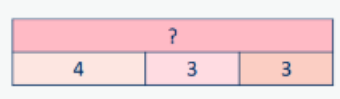
Progression of Addition.

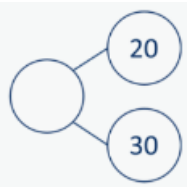
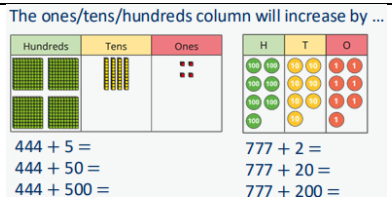
Children are taught to understand addition as combining two sets and counting on. Fluency is built through the year groups. Children are encouraged to recall number facts to allow for rapid mental calculations.

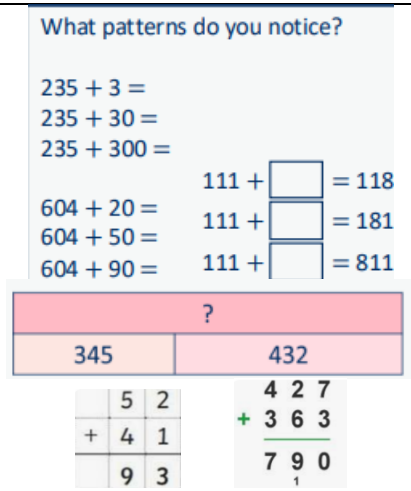
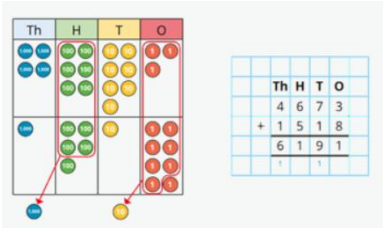
From Key Stage 1 children are encouraged to use jottings to support their learning and as they develop confidence they move onto to mental calculations. Models are introduced and continue to be used throughout the school for consistency and familiarity.

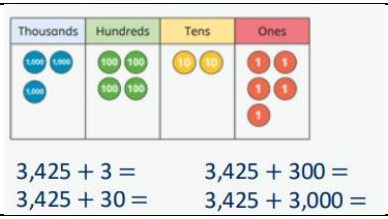
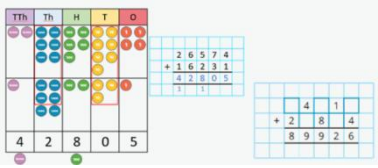
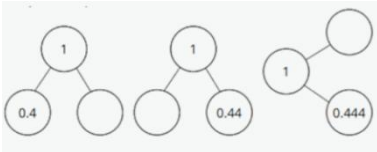
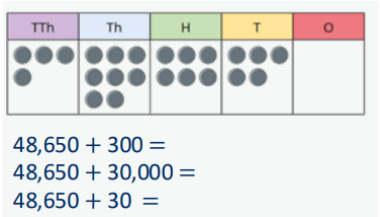
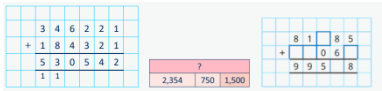
Steps	Progression of skills.	Suggested activities	Models and Images	Vocabulary
Foundation 1	Counting songs and rhymes Begin to have awareness, understanding and knowledge of number and numerals 1-5 Focus on noticing and representing small quantities, perceptual subitising and counting. Counting to 10 Recognising numerals 1-5 Make numbers 1-5 using fingers, objects or marks Cardinal principle Subitising to 3 or 4 More and fewer How many altogether Add 1 more through stories, songs and rhymes.	All activities are practical Counting objects Counting out objects from a larger group Matching objects to numerals Instantly see how many when shown an amount of objects. Begin to count objects using 1-1 correspondence. Show numbers 1-5 using fingers, objects or marks.	Objects, cubes, pictures, songs and rhymes, plates, real life or topic related objects, number cards, dice, beads, buttons, fingers. 	Number 1,2,3,4,5,6,7,8,9,10 Count Counting How many? How many altogether? How many do you see? How many are there? Show me… How many do I have now? Count out … from a larger group.
Foundation 2	Conceptually subitise to 5 Notice the parts that make up the whole. 1 more Continue to link to stories, songs and rhymes. Notice the composition of numbers within 10 - link to stories, songs and rhymes. 2 groups are combined to find the total. Add more- A quantity is increased.	Story book/song/rhymes related to addition Notice composition of numbers to 10 Using Tens frame or numicon Use numicon to add one more/number bonds/ subtise up to 10	Numicon, cubes, pictures of different amounts of objects/dots, buttons, objects to count, five's frame, ten's frame, story books related to addition, real life objects eg socks, Songs and rhymes dice.	What do you see? How do you see it? 1 more than … is … How many…? How many…? How many altogether? How many ways can you make…? There are …. There are …. There are …. altogether. …. and …. make …

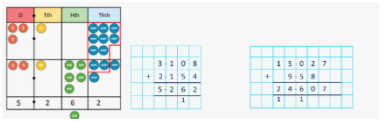
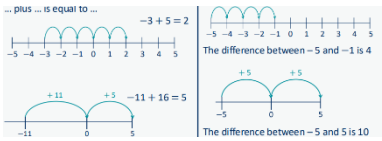
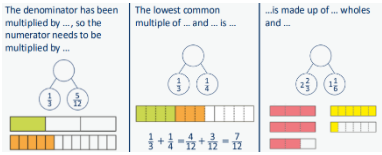
	Have a deep understanding of numbers to 10, including the composition of each number. Subitise (recognise quantities without counting) up to 5 Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 and some number bonds to 10, including double facts.	 Use five's frame/ten's frame to add one more- individual/ large outside.  Pictures of objects shown for children to conceptually subitise 5/10 Use large number lines and dice game indoors and out.  Use of rhymes and songs to notice the composition of numbers within 10 Use of objects/fingers/ ten's frame to count to combine a total	fingers  Number lines to 5/10  Numicon 	First... Then.... Now... I have .... I add .... more. Now I have....

		Number stories- 3 cows came to the field then 2 mor cows came.How many altogether? Move away from objects and allow children to practice number bonds to 5 and some to 10 orally		
Year 1	3 + 2 = Word problem – I have 3 pencils and Miss Kaur gave me 2 more. How many do I have now? Use jottings to represent numbers III + II = Add together/add more. Rapid recall of number bonds within 10. 3+7= 10 6+4= 10 Related facts within 20 Addition of two 1-digit numbers.	Children can draw a picture to help them work out. Use of jottings is taught and promoted. Use concrete objects, pictorial representations and also mental working out. Mental recall of number facts within 10 and 20. Encourage rapid recall. Introduce symbols + and = Missing numbers activities.	Number lines. Tens and ones Bead strings Bar model Part whole model  Tens frames  Fingers, Counters, Cubes	Add Plus One more than More than Part Whole Equal to Pattern
Year 2	This can be individual jumps of 1 on a number line or when confident in one jump. Use of counting on encouraged. 3 + 5 = 	Use the number line to add Record addition in columns to support place value to prepare them for year 3.	100 Square Tens and ones Number lines Bar model  Ten frames Counters	Find the difference How do you know? How many more? If the whole is, then the part is? Column method addition

	Children move on from number line given to using a number square and drawing their own number line starting from an appropriate chosen number. For 2 digit numbers children will learn to add the ones and then the tens. 24 + 15 = 4 + 5 = 9 20 + 10 = 30 Then… 30 + 9 = 39 • Adding 2-digit number • Adding 3 one-digit numbers • Inverse relationships for addition and subtraction • Add 2-digit numbers across 10 • Add 2-digit number (not across ten) • Using column method for 2-digit number • Solve missing number problems • Recall addition facts fluently		Cubes Part whole model 	
Year 3	Children learn column addition once confident with number line addition. Numbers are in each square on the page to ensure they line up. Add ones first and then add tens.	Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes. Written methods taught for those calculations they are		Column addition, units, tens, hundreds, thousands, carry over, partitioning Addition, place value, exchange, carry over

	+24 68 • Add 1s, 10s or 100s to a 3-digit number • Add two numbers (no exchange) • Add two numbers across a 10 or 100 • Complements to 100 • Add fractions with the same denominator within 1 whole Calculate the duration of events	unable to complete in their heads.		
Year 4	• Add numbers with up to 4 digits using a formal written method. • Add 1s, 10s and 100s to a 4-digit number. • Add up to two 4-digit numbers. Could also be used in: • Add decimal numbers in the context of money. • Add fractions and mixed numbers with the same denominator beyond 1 whole. **3147** **+ 225** **3372** **1**	Children will develop their fluency skills using them for mental methods with increasingly large numbers. Children will develop their use of written methods to add pairs of numbers of up to 4 digits.	Place value chart and counters Bar models Part-whole models Column addition Number lines. 	Addition Increase Decrease Exchange Column addition Partition Fraction Mixed number Numerator Denominator Whole Decimals Estimate Inverse Number bonds Sum Digit

				
Year 5	• Add whole numbers with more than 4 digits, including using formal written methods. • • Add numbers mentally with increasingly large numbers. • • Add decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1 • • Add fractions with the same denominator, and denominators that are multiples of the same number. • **John drove 158.4 miles on the Saturday and 15.7 miles on the Sunday.** **How far did he travel over the weekend?** **158.4** **+ 15.7** **174.1** **11**	Addition is taught through fractions. Addition is taught through decimals.   	Place value chart. Bar models. Part-whole models. Place value counters.	Integer Ten thousands One hundred thousands
Year 6	Continue with methods taught in Year 5 embedding concepts and building fluency. Add integers up to 10 million	Estimate and use inverse operations to check calculations.		Order of operations Intervals

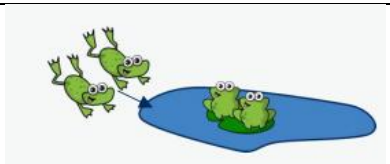
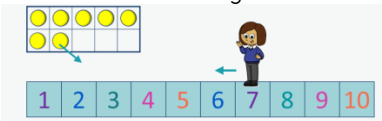
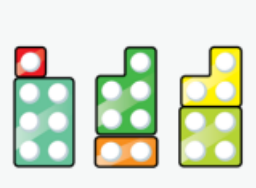
	Add decimals with up to 3 decimal places Order of operations Negative numbers Add fractions	Column addition, use of exchange. Which has greater priority. What do you need to do first? Finding the difference between 2 negative numbers. Convert fractions to add. Moving onto fractions where one denominator is a multiple to the other and then mixed fractions.	 BIDMAS   	Denominators and mixed numbers. Equivalent fractions.

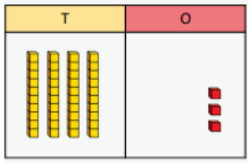
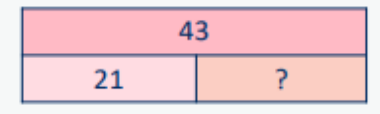
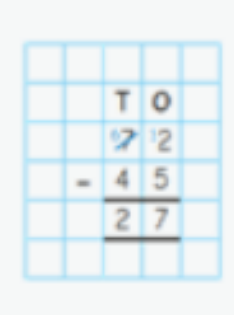
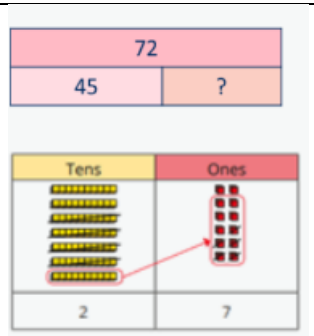
Progression of Subtraction.

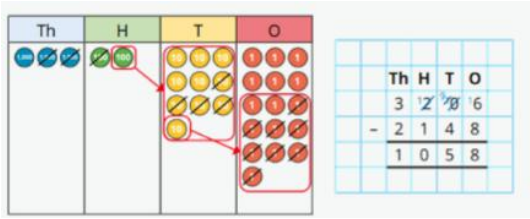
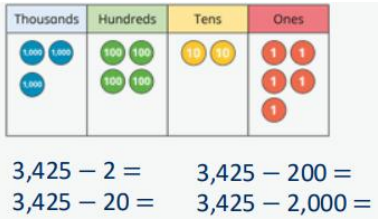
Children are taught to understand subtraction as taking away (counting back) and finding the difference (counting up). Through the use of the part whole model they learn that a number can be made up of parts.

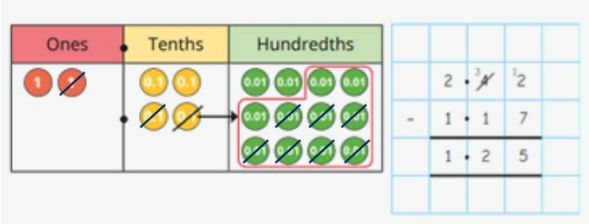
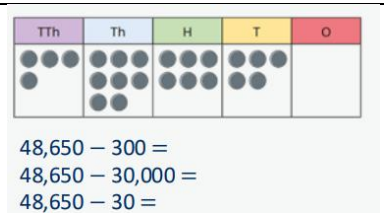
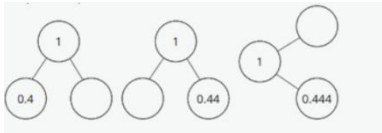
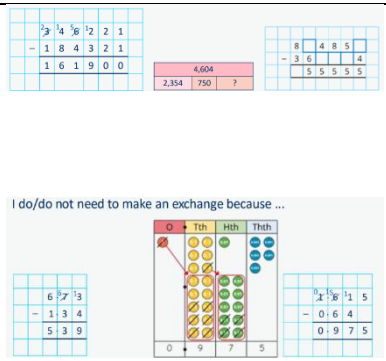
As with addition children are encouraged to use jottings to support their learning and as they develop confidence they move onto to mental calculations. Models are introduced and continue to be used throughout the school for consistency and familiarity. The children are taught that Subtraction is the inverse of addition and to use their addition knowledge in answering subtraction questions.

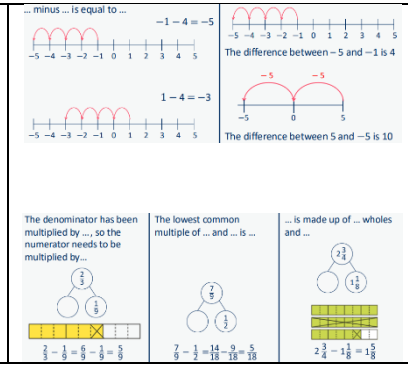
Steps	Progression of skills	Suggested activities	Models and Images	Vocabulary
Foundation 1	Counting songs and rhymes Counting to 10 Recognising numerals 1-5 Make numbers 1-5 using fingers, objects or marks Count how many Begin to have awareness, understanding and knowledge of number and numerals 1-5 Counting to 10 and back Recognising numerals 1-5 Subitising to 3 or 4 More and fewer Take away 1 through stories, songs and rhymes. Focus on noticing and representing small quantities, perceptual subitising and counting.	All activities are practical Counting objects Counting out objects from a larger group Matching objects to numerals Instantly see how many when shown an amount of objects Begin to count objects using 1-1 correspondence. Show numbers 1-5 using fingers, objects or marks. Songs and rhymes		Number 1,2,3,4,5,6,7,8,9,10 Count Counting How many? How many do you see? How many are there? Show me... How many do I have now? Count out ... from a larger group.
Foundation 2	Conceptually subitise to 5 1 less Notice the composition of numbers within 10 - Link to stories, songs and rhymes. Partition	Composition of numbers within 10/one less - Link to stories, songs and rhymes.	Numicon, beads, buttons, Five frames, Tens frame, number line, cubes, animals, story books/rhymes/songs related to take away	• What do you see? How do you see it? • 1 less than ... is • How many...? How many...?

	Take away- Continue to link to stories, songs and rhymes. Have a deep understanding of number to 10, including the composition of each number. Subitise (recognise quantities without counting) up to 5 Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (and some subtraction facts) and some number bonds to 10, including double facts	 One less-Use a large number line 0-10 and a tens frame to explore takeaway  Partition - Using objects, explore different ways to partition a number into 2 or more  Move away from objects and practice automatic recall of some subtraction facts to 5	Pictures of amounts of objects to 10, fingers, puppet to take one away	How many altogether? • How many ways can you make. . .? • There are . . . altogether. I can see . . . here and . . . there. • . . . and . . . make . . .? • First. . . Then. . . Now. . . • I have . . . I take . . . away Now I have . . .
Year 1	**Take away – 5 – 3 = 2 I had 5 sweets, I ate 3 how many are left?** **Find the difference – Mrs Mann has 8 sweets and I have 5. How many more sweets does Mrs Mann have?**	Finding a part using part whole grids. Children find the difference by counting on from the smallest number to the largest. Begin to recognise subtraction as an inverse to addition.	Number lines – filled and blank Tens and ones Bead strings. Bar model Part whole model Tens frames Fingers Counters	Subtract Minus Take away Less than One less than Part Whole Total

	Subtracting ones from any number. Number bonds within 20. Missing numbers.	Subtraction counting back on a number line. Jumping in ones to begin and as more confident children can use number bond facts to make larger jumps.	Cubes	First, Then, Now Equal to
Year 2	**Counting on to find the difference.** **Counting back** – 45 – 32 = Take away 2 then take away the 3 tens. Subtract across 10 Subtract multiples of 10 Subtract 2-digit numbers (not across 10) Missing numbers Subtract 1- from any number Subtract 2-digit numbers (across 10) Subtract across a 10 Solve missing number problems Introduce vocabulary 'exchange' using tens and ones equipment, those more confident to work using jottings.	Creating own number lines for working out. Children must be able to choose the most efficient method depending on the calculation given, whether to count up or back; whether to perform mentally, or with a number line / jottings Children are taught to partition given numbers in a variety of ways, beyond simple tens and ones. For example: 15 – 7 = - 5 – 2	100 Square Tens and ones chart Bar model Part-whole model Tens frame Counters   	Tens take away ones Exchange to make 10 If a whole is… then a part is…? Number sentence
Year 3	**Children learn column subtraction once confident with number line subtraction. Numbers are in each square on the page to ensure they line up.** 4 1 ~~5~~4 -36 18	Column subtraction.  	 	Tens Ones column Place holder Carry Exchange Tenths hundredths

	Subtract 1s, 10s and 100s from a 3-digit number Subtract two numbers (no exchange) and then across a 10 or 100 Complements to 100 noticing patterns. Subtract fractions with the same denominator within 1 whole			
Year 4	Subtract 1s, 10s, 100s and 1,000s from a 4-digit. number Subtract up to two 4-digit numbers.  	• Subtract 1s, 10s, 100s and 1,000s from a 4-digit number. • Subtract up to two 4-digit numbers. Is also used in: • Subtract decimal numbers in the context of money. • Subtract fractions and mixed numbers with the same denominator.	Place value chart and counters Number lines Part-whole models Bar models Column subtraction  	Exchange Subtraction Difference Decrease Inverse Estimate Partition Digit Integer Numerator
Year 5	Subtract whole numbers with more than 4 digits • Subtract using mental strategies • Subtract decimals with up to 2 decimal places • Complements to 1 • Subtract fractions with denominators that are a multiple of one another	Use of column subtraction continues with increasingly larger numbers. Subtraction is taught through fractions and decimals. When subtracting decimals, children need to understand that decimal points line up underneath each other.	Place value chart. Bar models. Part-whole models. Place value counters.	Ten thousands One hundred thousands Integer Powers of

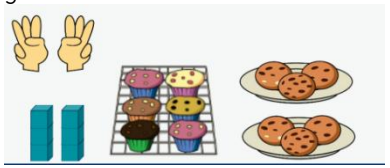
	Tom has £63.94 he spends £31.78. How much money does he have left? 8 1 £63.94 -£31.78 £ 32.16 	 		
Year 6	Subtract integers up to 10 million Subtract decimals with up to 3 decimal places Order of operations Negative numbers	Children to give reasons for reason for or against exchange to recognise when it is needed. Children to explain which has priority. Finding the difference between a negative and positive number.	 BIDMAS	Integers Positive and negative numbers. Lowest common multiple. . .

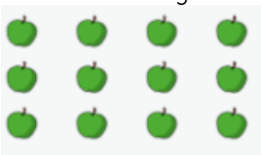
	Subtract fractions	Throughout the year children will practice using column subtraction developing fluency. Children should be able to choose most efficient method.		

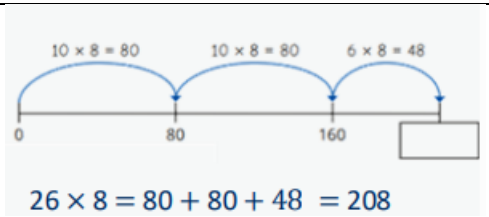
Progression of Multiplication.

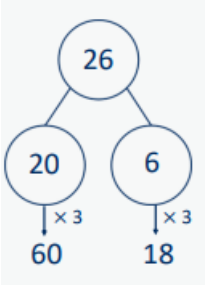
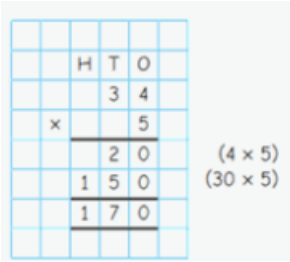
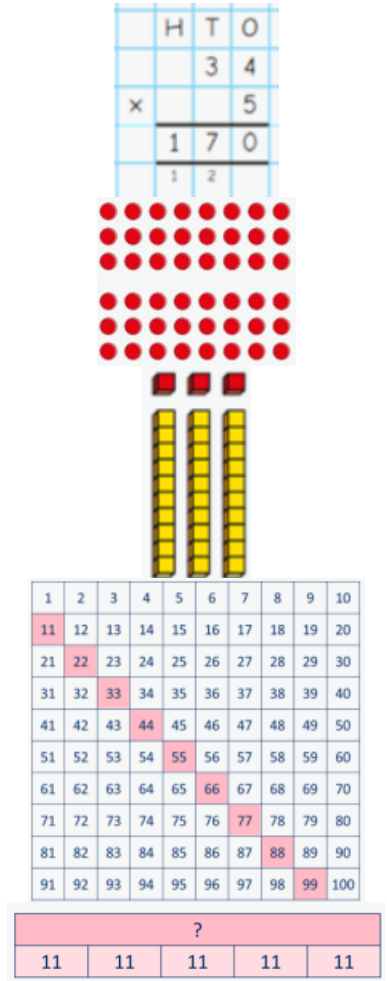
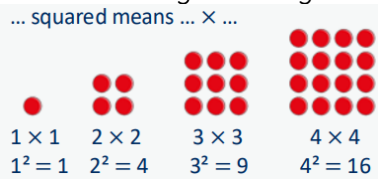
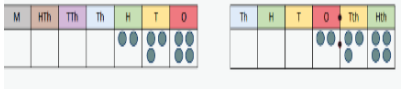
Children are taught multiplication as repeated addition, equal groups and the use of arrays. Multiplication skills are used across

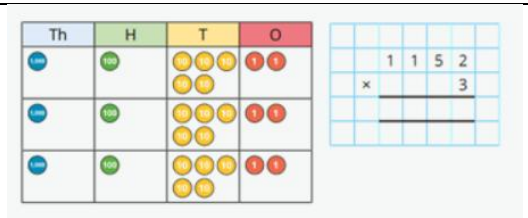
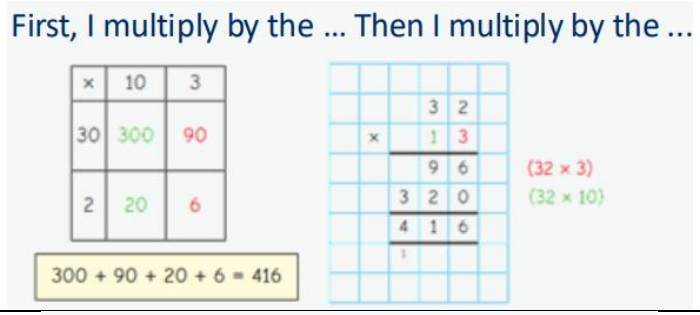
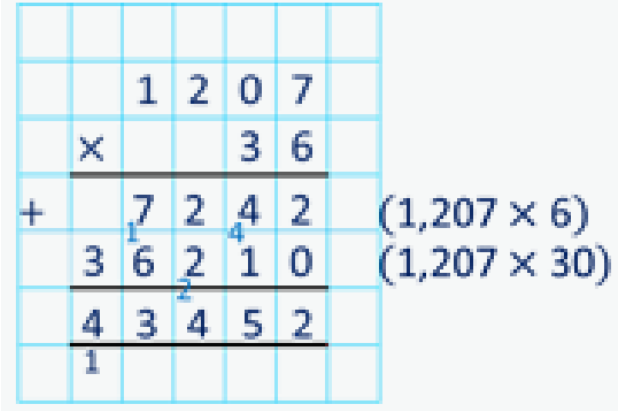
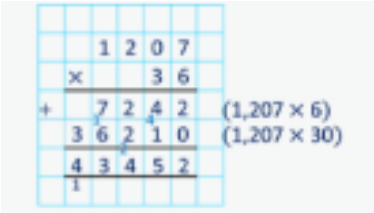
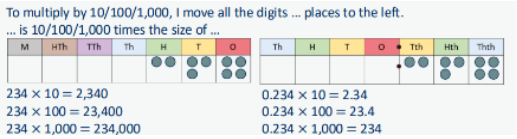
Times Tables Rock Stars is used alongside the White Rose scheme to promote learning of times tables at home and also tgo develop fluency in recall of multiplication number facts.

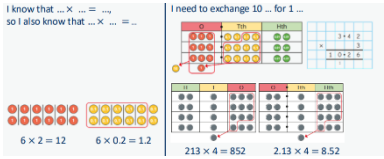
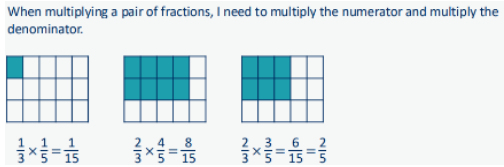
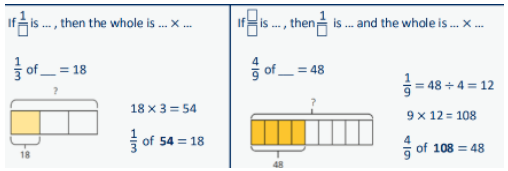
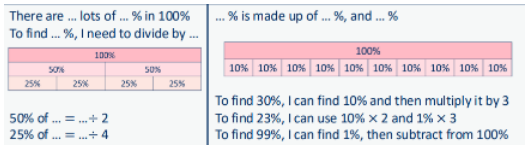
Steps	Progression of skills	Suggested activities	Models and Images	Vocabulary
Foundation 1				
Foundation 2	Double to 10 Make equal groups Have a deep understanding of number to 10, including the composition of each number. Subitise (recognise quantities without counting) up to 5 Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 and some number bonds to 10, including double facts. Explore and represent patterns within numbers up to 10, including evens and odds,	**Double to 10:** Prompt children to notice that double means twice as many and to notice that there are two equal groups  Provide opportunities to make equal groups when tidying up or during snack time. Encourage children to check that each group has the same amount. Recognise odd and evens using numicon/children/objects	Fingers, objects, food, numicon, cubes, buttons, toy animals, tens frame, numerals	Double … is … … … is double … There are … groups of … There are … altogether.

	double facts and how quantities can be distributed equally.			
Year 1	Count in 2s, 5s and 10s. Repeated addition 10 + 10 +10 = 30 Add equal groups. Recognise equal and unequal groups. Make arrays.  To know that arrays are made of rows (across) and columns (down). Make doubles	What do you notice? Patterns on a number square. Arrays being groups 	Number lines. Tens and ones Bead strings. Bar model Part whole model Tens frames Fingers Counters Cubes Arrays	Equal Groups of All together Same Different Rows Columns Double Arrays
Year 2	Move repeated addition learning onto multiplication being groups of/ lots of. Continue to use arrays. Doubles of one-digit and 2-digit numbers. Two times table Five times table	__ lots of 2 = _x2 = $\square \times 2 = 18$ $18 = 2 \times \square$	100 Square Tens and ones chart Bar model Part-whole model Tens frame Counters 3 lots of 5 = 15 5 + 5 + 5 = 15 	There are how many equal groups? There are….altogether. ….lots of….makes… Double…..is……. Group Altogether multiply

	Missing numbers			
Year 3	The 3 times-table The 4 times-table The 8 times-table Related facts 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 Correspondence problems.	Continue progression of times tables to 3,4 and 8.		Multiply, remainder, digit, mental, formal methods, carryover
Year 4	• Times-table facts to 12 × 12. • Multiply by 1 and 0. • Multiply 3 numbers. • Factor pairs.		Column multiplication Bar model Dienes Counters Hundred squares Number lines Arrays	Times Multiply Equal groups Partition Digit Equivalent Expanded form

	• Multiply by 10 and 100. • Related facts. • Mental strategies. • Multiply a 2 or 3-digit number by a 1-digit number • Correspondence problems.	 	Place value chart 	Commutative
Year 5	Multiples and factors • Square and cube numbers • Multiply numbers up to 4 digits by a 1-digit number • Multiply numbers up to 4 digits by a 2-digit number	Multiplication is taught through fractions. Multiplication is taught through decimals. 		Prime numbers Square numbers Cube

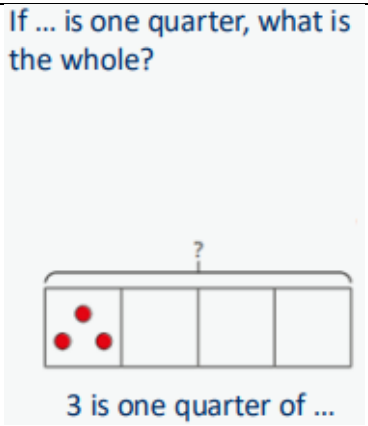
	• Multiply by 10, 100 and 1,000 • Mental strategies • Multiply fractions by a whole number • Multiply mixed numbers by a whole number • Find the whole	 		numbers Short division Operations Formal written method Integer Multiples Factor Product
Year 6	Multiply numbers up to 4 digits by a 2-digit number Multiply by 10, 100 and 1,000 Order of operations		  BIDMAS	Ratio Percentages integers

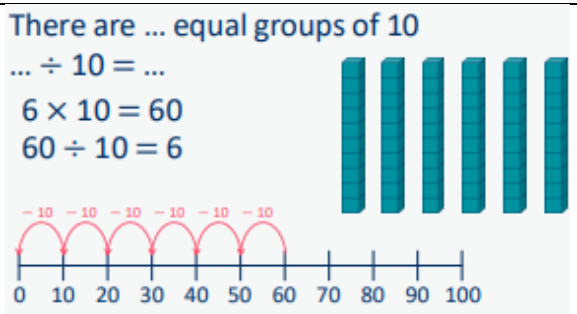
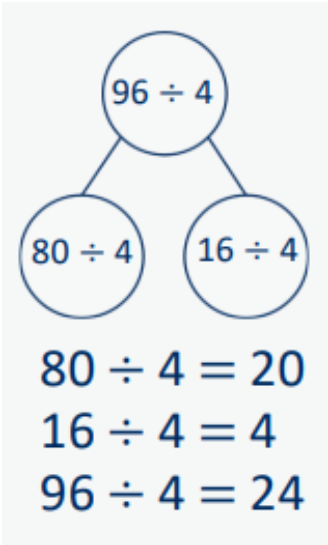
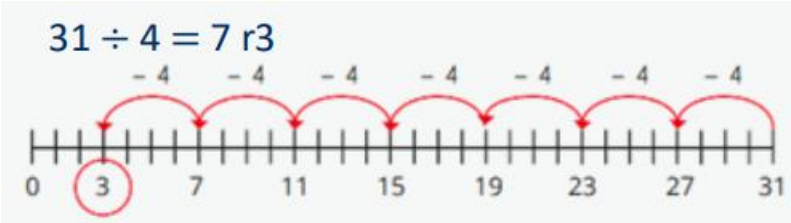
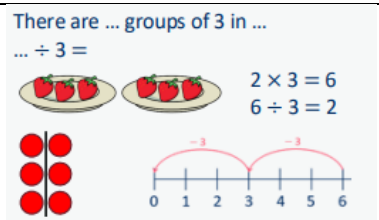
	Multiply decimals by integers			
	Multiply fractions by fractions			
	Find the whole			
	Calculations involving ratio			
	Calculate Percentages			

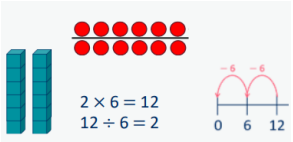
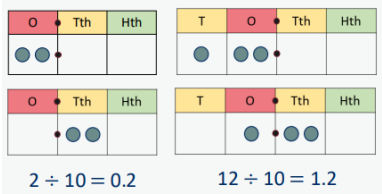
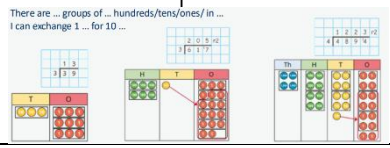
Progression of Division.

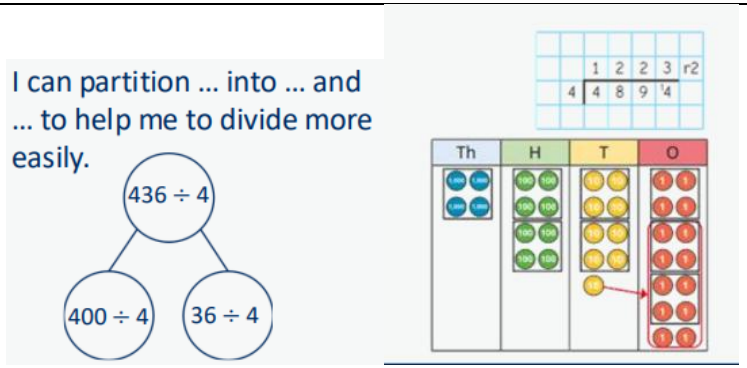
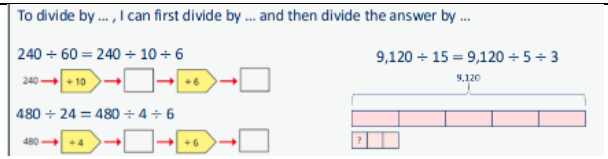
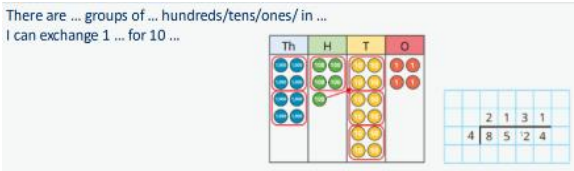
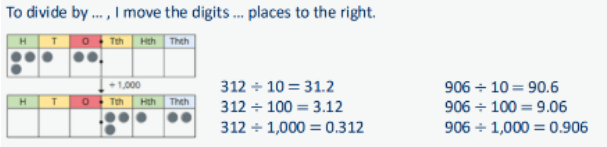
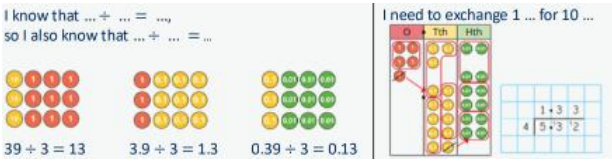
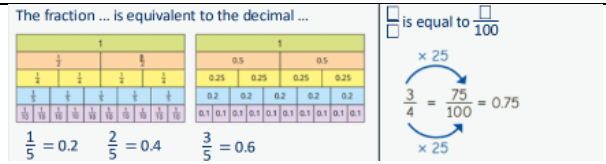
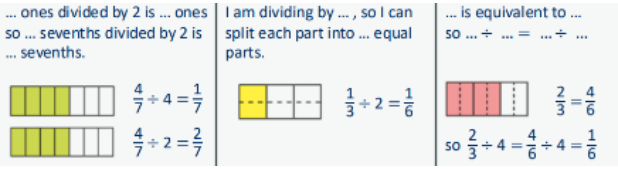
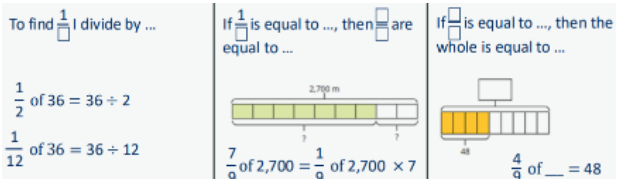
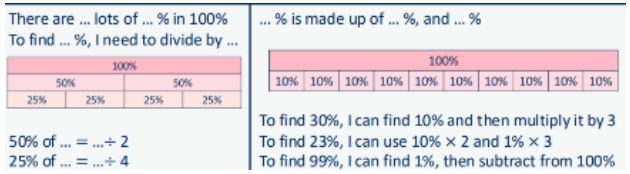
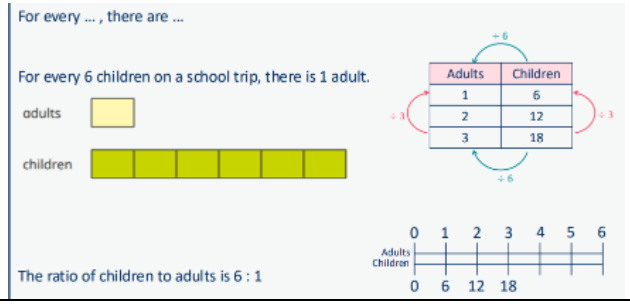
Children are taught division through sharing and grouping and learning is linked with multiplication recognising the inverse. All children are encouraged to develop skills in mental calculation alongside the development of written methods. Children by the end of Year 6 need to be confident and competent in choosing the most efficient method appropriate to the numbers given.

Steps	Progression of skills.	Suggested activities	Models and Images	Vocabulary

Foundation 2	Sharing Grouping	Provide practical activities such as sharing items during snack time. Encourage children to check whether items have been shared fairly (equally). Provide opportunities to make equal groups when tidying up or during snack time. Encourage children to check that each group has the same amount. Read story books linked to sharing and grouping.	Cubes, objects such as toy animals, cars, buttons, story books, toys in boxes labelled with pictures to support grouping at tidy up time	There are … altogether. They are shared equally between … groups. There are … groups of … There are … altogether.
Year 1	Make equal groups – grouping Make equal groups – sharing Find a half Find a quarter		Number lines. Tens and ones Bead strings. Real life objects Number lines. Tens and ones Bead strings. Bar model Part whole model Tens frames Fingers Counters Cubes	All together Share Equal Equally Groups Half Quarter Whole

Year 2	Divide by 2 Divide by 5 Divide by 10 Unit fractions Missing numbers Non-unit fractions		100 Square Tens and ones	
Year 3	Divide by 3 Divide by 4 Divide by 8 Unit fractions of a set of objects Non-unit fractions of a set of objects	Use of bar model to divide/ fractions.  	 Different pictorials such as arrays, number lines can be used.	Divide, remainder, digit, mental, formal methods, Bus Stop method

Year 4	Use of x facts. 2 x 7 = 14 14 / 2 = 7	• Division facts to 12 × 12 • Divide a number by 1 and itself. • Related facts. • Divide by 10 and 100	Bar models Base 10 counters Number lines Cubes  Place value chart  Pictorial aids Bus stop method. 	Grouping Sharing Exchange No exchange Remainder Tenth Hundredth Bus stop Equal Compare
Year 5	Mental strategies • Divide by 10, 100 and 1,000 • Fraction of an amount	Division is taught through fractions. Division is taught through decimals.	Place value chart. Part whole.	Prime numbers Square numbers Cube numbers Short division Dividend Divisor Quotient

				Operations Formal written method Integer
Year 6	Short division Mental strategies Order of operations Divide by 10, 100 and 1,000 Divide decimals by integers Decimal and fraction equivalents	  BIDMAS  		

	Divide a fraction by an integer Fraction of an amount Calculate percentages Calculations involving ratio