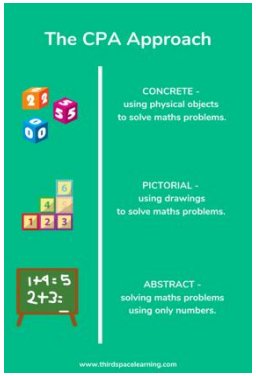
Hallam Primary School Presentation Policy

EYFS	Key Stage 1	Key Stage 2
Children in our EYFS classes learn the foundations of Maths through our concrete, pictorial and abstract (CPA approach). Children are given the time to explore the range of resources to build up their conceptual knowledge of number and Maths. Children's work will be evidenced with photographs and observations that capture children demonstrating their automatic recall and deep understanding of number through talk. This will be evident in their maths books, with the learning objective and date clearly stated at the top of the page.	Date and learning objective and to be at the top of the page. **Year 1** • Questions may be provided by the teacher and stuck into the books under the learning objective. • Photographs to show practical learning may be evidenced in the book • Children will write in squared books, with the correct number formation and using one number per square. • All children to write in pencil. **Year 2** • Calculations may be written straight onto the page • Questions may be provided by the teacher; these are to be stuck down half a page leaving additional space for children to show calculations and answers using the squares. • All children to write in pencil. • Children may have a QR code in their book to access questions electronically through an iPad, or to display evidence of concrete learning.	Date and learning objective and to be at the top of the page. **Year 3, Year 4, Year 5 & Year 6** • Calculations may be written straight onto the page. • Questions may be provided by the teacher; these are to be stuck down half a page leaving additional space for children to show calculations and answers using the squares. • Children will write in squared books, with the correct number formation and using one number per square. • All children to write in pencil. • Children may have a QR code in their book to access questions electronically through an iPad, or to display evidence of concrete learning.

Hallam Primary School Calculation Policy



What is the Concrete Pictorial Abstract in Maths?

The Concrete Pictorial Abstract (CPA) approach is a system of learning that uses physical and visual aids to build a child's understanding of abstract topics.

Pupils are introduced to a new mathematical concept through the use of concrete resources (e.g. fruit, Dienes blocks etc). When they are comfortable solving problems with physical aids, they are given problems with pictures – usually pictorial representations of the concrete objects they were using.

Then they are asked to solve problems where they only have the abstract i.e. numbers or other symbols. Building these steps across a lesson can help pupils better understand the relationship between numbers and the real world, and therefore helps secure their understanding of the mathematical concept they are learning. All stages should be taught simultaneously whenever a new concept is introduced and when the teacher wants to build further on the concept.

Progression in the teaching of counting in EYFS

1. Pre-Counting	2. Ordering	3.	4. One to one correspondence	5. Cardinality (Knowing the final number counted is the total number of objects)
The key focus in pre-counting is an understanding of the concepts more, less and the same. Children will have an appreciation for how these are related. Children at this stage develop these concepts by comparison and no counting is involved. For example: Sorting groups using language more and less.	Count by reciting the number names in order forwards and backwards from any starting point For example: Counting orally clapping or drumming to the numbers.		One number word has to be matched to each and every object. Lack of coordination is a source of potential error – children to move the objects as they count, use large movements or clap as they count. For example: Traditional counting songs such as 5 little ducks, 10 green bottles	Count out a number of objects from a larger collection. Knowing the number they stop counting at will give the total number of objects. For example: Provide children with objects to move as they count and say the number.
6. Subitising	**7. Abstraction**	**8.**	**9. Conservation of number**	**10. End of year counting expectations**

Children to recognise small amounts without counting them. For example: subitising dominoes, dice, tens frames.	Children can count anything, visible or hidden objects, imaginary objects, sounds etc. Children find it challenging to count things they cannot move, touch, see, that move around. Children find it difficult to count a mix of objects that are different sizes. For example: counting something on a picture, counting objects in a pot blindfolded.		Children need to realise that when objects are rearranged the number of them stays the same. For example: different pictorial representations of the number 7, in a line or all spread out.	• Count reliably to 20 • Count reliably up to 10 everyday objects • Estimate a number of objects then check by counting • Use ordinal numbers in context e.g. first, second, third • Count in twos, fives and tens • Order numbers 1-20 • Say 1 more/1 less than a given number to 20

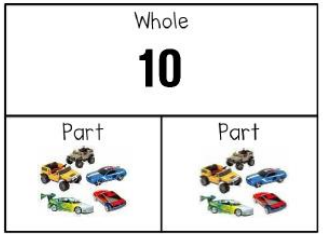
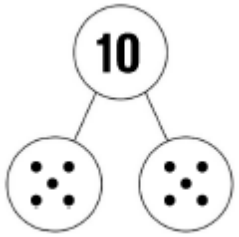
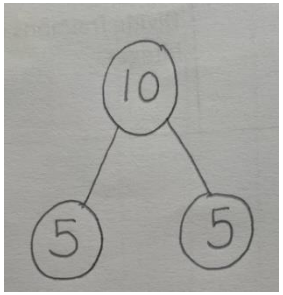
Progression in the teaching of calculations:

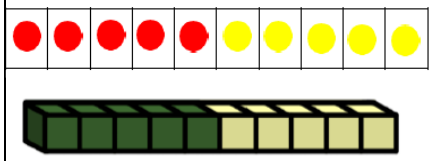
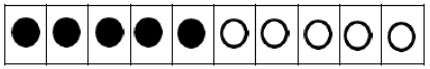
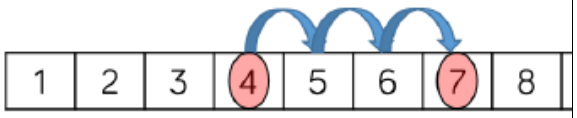
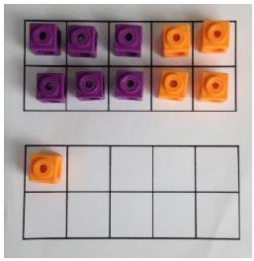
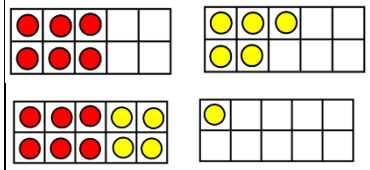
	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Addition	Combining two parts to make a whole: part, part whole Starting at the bigger number and counting on: number lines	Combining two parts to make a whole: part, part whole Starting at the bigger number and counting on: number lines Regrouping to make 10	Adding three single digits Adding two 2-digit number and ones. Adding two 2-digit numbers Adding two 2-digit numbers (Exchanging)	Column addition (Up to 3 digits) Column addition – regrouping Adding fractions with same denominator	Column addition (up to 4 digits) Column addition – regrouping Adding fractions with same denominator	Column addition (more than 4 digits) Column addition – regrouping Adding fractions with uncommon denominators including mixed numbers. Adding decimals with the same amounts of decimal places.	Column addition (more than 4 digits) Column addition – regrouping Adding fractions with uncommon denominators including mixed numbers. Adding decimals with the same amounts of decimal places.
Subtraction	Subtracting ones	Subtracting ones Counting back Find the difference	Counting back Find the difference Make 10	Column Subtraction (Up to 3 digits) Column Subtraction – exchanging	Column Subtraction (Up to 4 digits) Column Subtraction – exchanging	Column Subtraction (more than 4 digits) Column Subtraction – exchanging	Column Subtraction Column Subtraction – exchanging

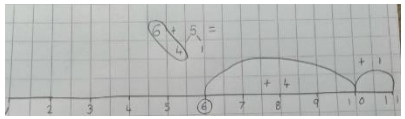
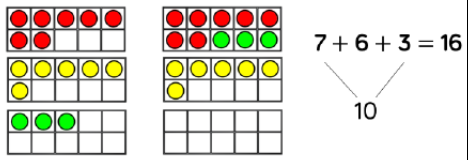
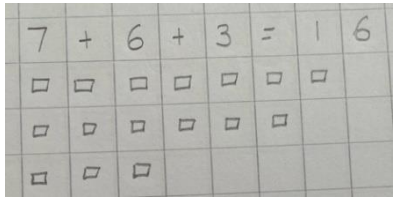
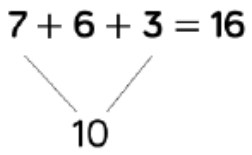
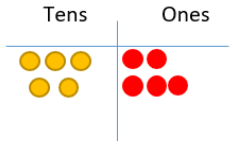
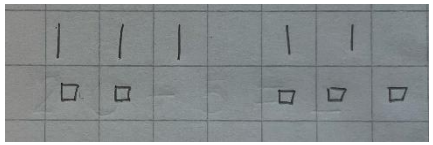
		Make 10	Subtracting three single digits Subtracting two 2-digit number and ones. Subtracting two 2-digit numbers	Subtracting fractions with the same denominator	Subtracting fractions with the same denominator	Subtracting fractions with uncommon denominators including mixed numbers Subtracting decimals with the same amounts of decimal places. Subtracting decimals with different amounts of decimal places.	Subtracting fractions with uncommon denominators including mixed numbers Subtracting decimals with the same amounts of decimal places. Subtracting decimals with different amounts of decimal places.
Multiplication	Doubling	Doubling Counting in multiples (1, 10) Repeated addition Arrays	Doubling Counting in multiples (2, 5, 10, 3) Repeated addition Arrays	Doubling Counting in multiples (3, 4, 8) Repeated addition Arrays Grid method multiplication	Column Multiplication (2 or 3 digit multiplied by a 1 digit)	Column Multiplication (Up to 4 digit by a one or two digit number) Multiplying fractions by an integer Multiplying fractions by fractions.	Column Multiplication (multi-digit numbers up to 4 digit by a 2 digit) Multiply 1 digit numbers with up to 2 decimal places by whole numbers. Multiplying fractions by an integer. Multiplying fractions by fractions.
Division	Sharing objects into groups	Sharing objects into groups Division as grouping Division with arrays	Sharing objects into groups Division as grouping Division with arrays	Division with arrays Division with a remainder Short division	Division with a remainder Short division	Short division	Short division Long division Divide fractions by an integer

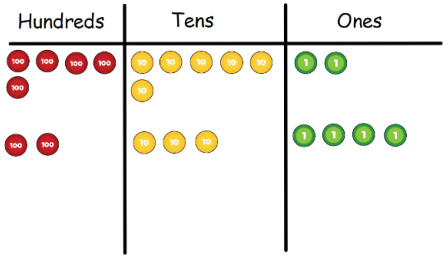
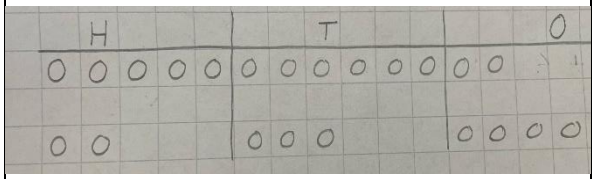
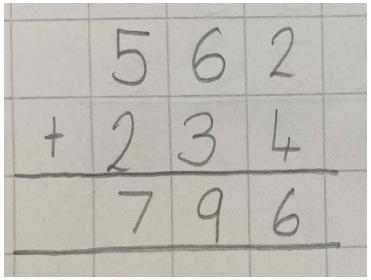
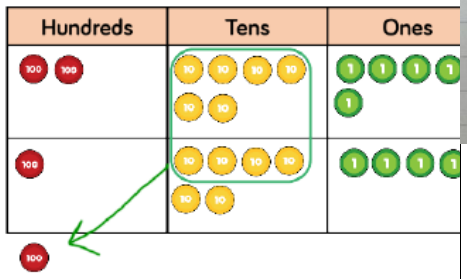
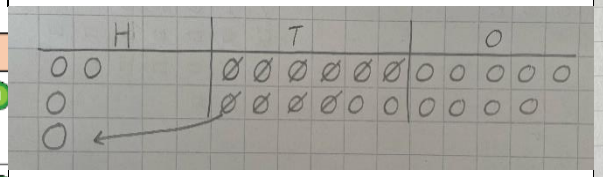
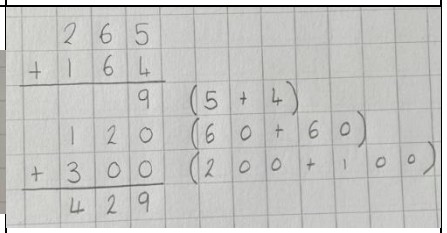
Hallam Primary School Calculation Policy

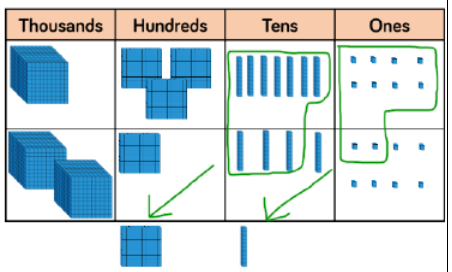
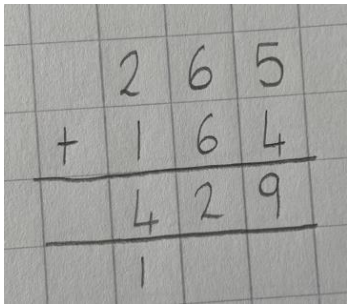
Addition

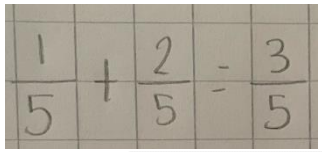
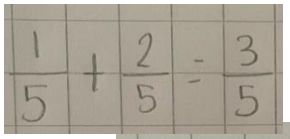
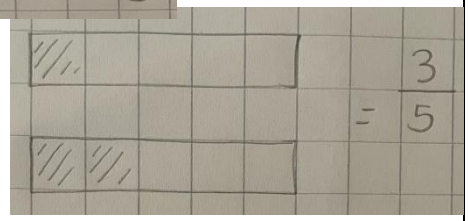
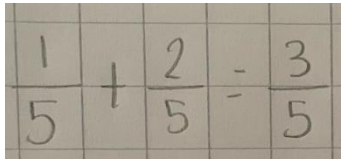
Objective and strategy	Concrete	Pictorial	Abstract	Key Vocabulary
EYFS	EYFS will use a range of mathematical and everyday objects to support their learning through continuous provision and direct teaching. E.g. home corner using plates with objects. Playdoh to imprint tens frames and part-part whole. Natural resources and loose parts in indoor and outdoor provision			Numbers 0 to 20 Subitise Evens Odds Number bonds Greater than Less than The same as One more than One less than
EYFS and Y1				
EYFS and Year 1 **Combining two parts to make a whole: part-whole model.**			 1. Write each number in a part.	Equal to More than Most Tens Ones Add Altogether Total More than

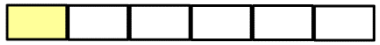
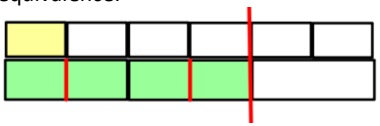
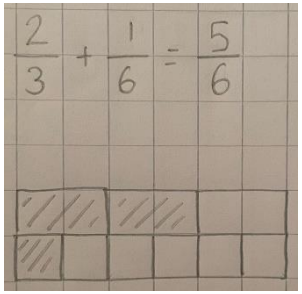
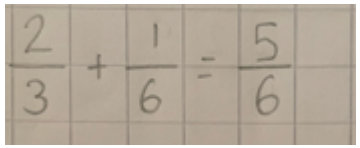
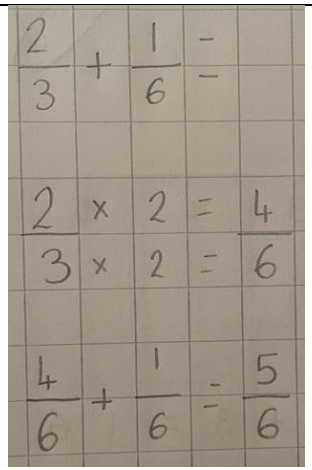
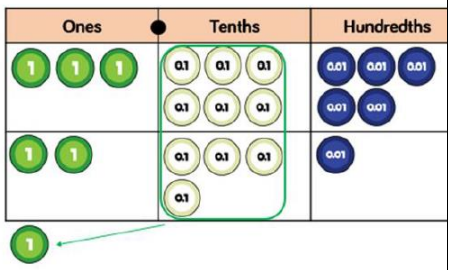
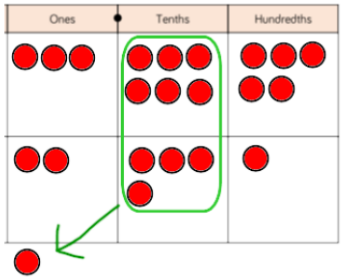
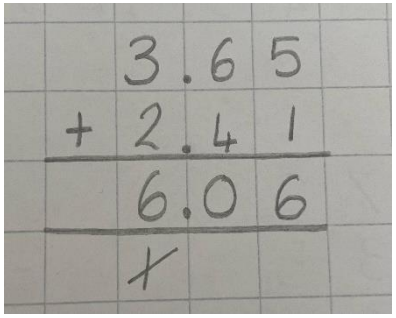
	 1. Make each number using the resource. 2. Count the parts to find the whole.	 1. Draw the first number in a part. 2. Draw the second number in a part. 3. Count to find the whole.	2. Work out the whole. 3. Write the addition calculations. 5 + 5 = 10	
<u>EYFS and Year 1</u> **Starting at the bigger number and counting on**	 1. Make the larger number with beads or cubes. 2. Add the smaller number. 3. Count the whole to find the total.	4 + 3 =  1. Start at the largest number in the calculation. 2. Count on in ones to find the answer.	4 + 3 = 7 1. Place the larger number in their head. 2. Count on the smaller number to find the answer.	
<u>Year 1</u> **Regrouping to make 10**	6 + 5 = 11  1.Make the larger number on the tens frame. 2. Use the smaller number to make 10. 3. The remaining objects go onto another tens frame.	6 + 5 = 11  1. Represent each number in a tens frame. 2. Identify the large number and its number bond pair to 10. 3. Move the ones needed across to make 10. 4. Subitise 10 and add the remaining ones verbally. 1. Identify the largest number in the calculation.	6 + 5 = 11 1. Use the largest number as the starting point. 2. Partition the smallest number into 2. The first number will be the number bond pair with the largest number. The second number will be the remaining ones left in the number. 3. Combine the number bonds to make 10. 4. Add the remaining ones to find the answer.	

		2. Partition the smallest number into 2 to make a number bond pair with the largest number and the remaining ones. 3. Combine the largest number and it's number bond to make 10. 4. Add the remaining ones.  *Children may either draw out their number lines or use pre-made number line resources.		
			Y2	
Year 2 **Adding three single digits**	 1.Where possible identify number bonds. 2. Add the remaining ones to the second tends frame	 1. Draw the first number in ones 2. Draw the second number using ones 3. Draw the third number using ones 4. Count the whole	1.  Identify the two number that make 10. 2. Add the remaining number. *Where there are no number bonds in the calculation, children to add the ones mentally. Start on the largest number and add the ones.	Tens Ones < > = signs Sum
Year 2 **Adding two 2-digit numbers**	32 + 23=  1. Use tens and ones counters/base 10 to make the first number in the calculation. 2. Use tens and ones counters/base 10 to make the second number in the calculation. 3. Count the ones.	32 + 23 =  1. Draw the tens and ones to represent the first number. 2. Draw the tens and ones to represent the second number. 3. Count the total of the ones. 4. Count the total of the tens.	32 + 23 = 1. 30 + 20 = 50 2. 2 + 3 = 4 3. 50 + 4 = 54 *Completed mentally or written if needed.	

	4. Count the tens. *base 10 and place value counters to be used.	5. Combine for the answer.		
		Y3-6		
Y3 – Y6 **Column addition** ***This method is applied addition of numbers up to and beyond 4 digits.**	562 + 234 = 1. Use the place value counters to make the  first number in the calculation. 2. Use the place value counters to make the second number in the calculation. 3. Add up the columns in the place value chart.	562 + 234 =  1. Represent the first number in the correct columns in the place value chart. 2. Represent the second number in the correct columns in the place value chart. 3. Add up the columns in the place value chart.	 1. Write the calculation in the correct colums for place value 2. Add the ones column 3. Add the tens column 4. Add the hundreds coloumn. *Children will continue to add the coloumns up to the appropriate place value.	Hundreds Tens Ones Column addition Estimate Inverse operation Accuracy
Y3 – 6 **Column Addition Regrouping** ***This method is applied addition of numbers up to and beyond 4 digits.**	265 + 164 =  1. Use the place value counters to make the first number in the calculation. 2. Use the place value counters to make the second number in the calculation.	265 + 164 =  1. Use the place value counters to make the first number in the calculation. 2. Use the place value counters to make the second number in the calculation.	 1. Write the calculation in the correct place value columns. 2. Add the ones column, write answer below. 3. Add the tens column. Write answer below. 4. Add the hundreds column. Write answer below.	

	3. Exchange where needed into the correct place value column. 3. Count the whole. *This can also be shown with base 10.  	3. Exchange where needed into the correct place value column. 3. Count the whole.	5. Add the ones column. 6. Add the tens column. 7. Add the hundreds column. *This leads children to have the understanding to use compact column addition as their most efficent method.  1. Add the ones column 2. Add the tens column 3. Add the hundreds column. *Where carrying is needed, children will represent this underneath the calculation.	

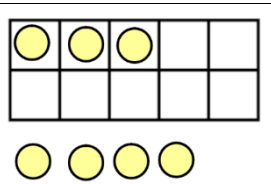
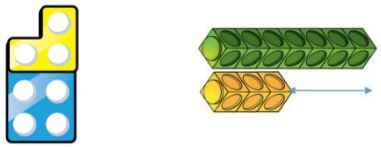
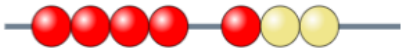
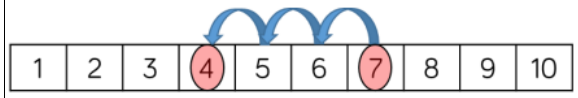
Year 3 – 4 **Adding fractions with the same denominator**	   1. Divide the whole into the number on the denominator. 2. Represent the numerator of the first fraction on the whole. 3. Represent the numerator of the second fraction on the whole. 4. Count up the shaded parts out of the whole.	  1. Draw out a bar and represent how many parts out of the whole for the first fraction. 2. Draw out a bar and represent how many parts out of the whole for the second fraction. 3. Combine the equal parts out of the whole for the numerator. 4. Count the whole for the denominator. *The denominator will not change when adding fractions with the same denominator.	 1. Add the numerators: 1 + 2 = 3 2. The denominator doesn't change when adding fractions with the same denominator.	Tenths Equal Denominator Numerator Equivalent fractions Decimal equivalent Non-unit fraction (any fraction that isn't 1)

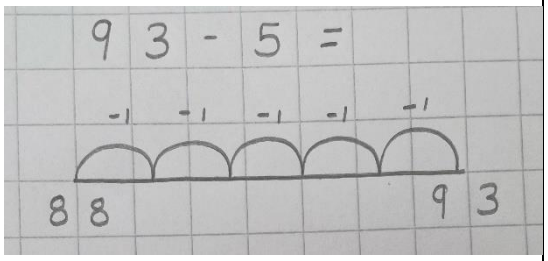
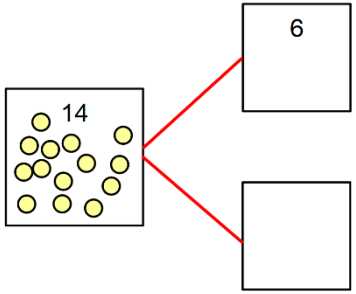
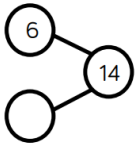
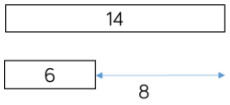
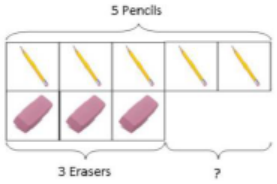
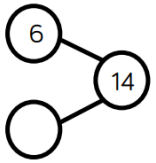
Year 5 – 6 **Adding fractions with uncommon denominators including mixed numbers.**	  1. Make each fraction using bar model resources. 2. Use the bar models to find the fraction's equivalence.  3. Combine the number of parts 	 1. Draw a bar model to represent both fractions. 2. Use the bar models to find the fractions equivalence. 3. Add the fractions. 	 1. Find the lowest common multiple between the denominators. 2. Convert the fractions to have the same denominators. 3. Add the fractions with the same denominator.	Multiples Mixed number Improper fractions Thousandth Tenths Hundredths Simplify Simplify Degree of accuracy
Year 5-6 **Adding Decimals**	3.65 + 2.41 =  1. Make the first integer using place value counters and add to the chart. 2. Make second integer using place value counters and add to the chart.	3.65 + 2.41 =  1. Draw the place value chart. 2. Represent each integer with the counters in the correct place value. 3. Where needed, exchange to the correct place value. 4. Write the answer.	 1. Add the hundredths. 2. Add the tenths. 3. Add the ones.	

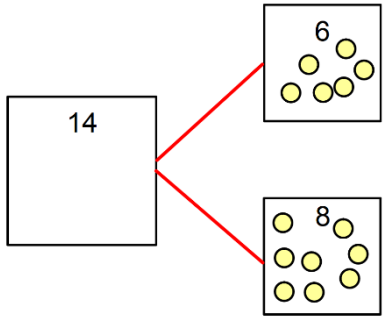
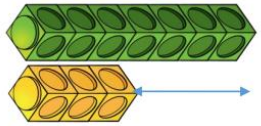
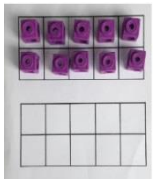
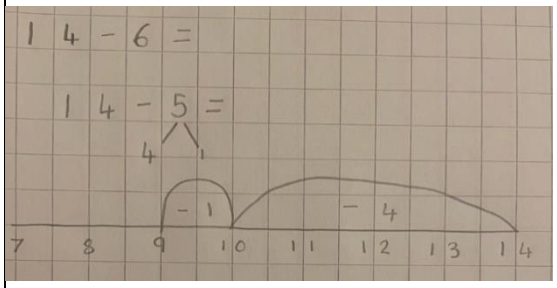
	3. Where needed, exchange to the correct place value. 4. Write the answer.		*Children will exchage and carry below where necessary.	

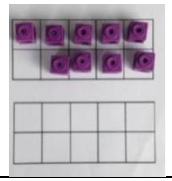
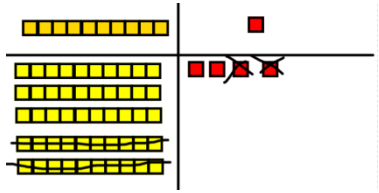
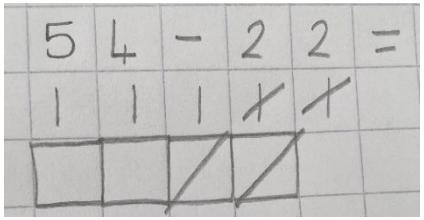
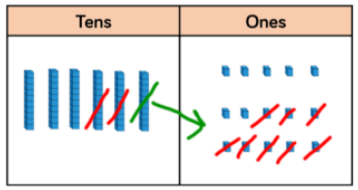
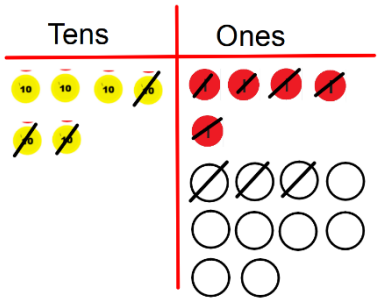
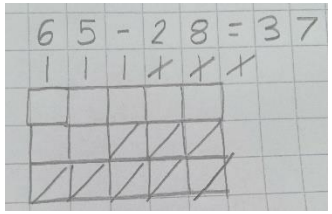
Subtraction

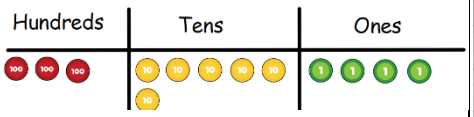
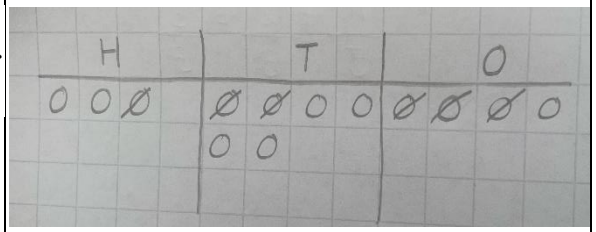
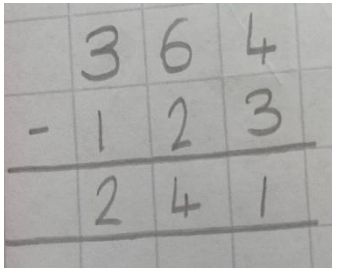
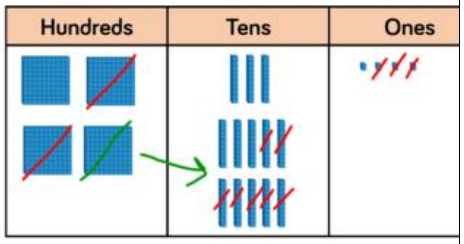
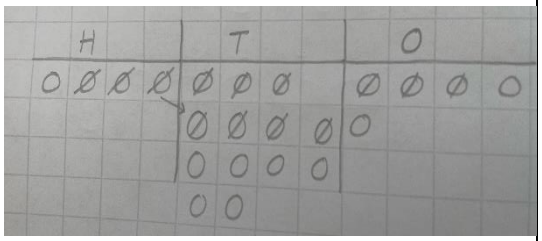
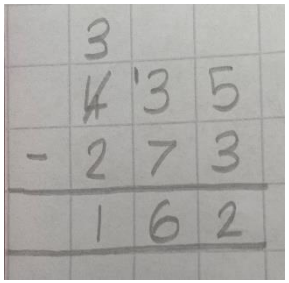
Objective and strategy	Concrete	Pictorial	Abstract	Key Vocabulary
EYFS	EYFS pupils will intially begin understanding subtraction is taking away through the use of concrete resources e.g: Toys in provision (indoor/outdoor) Snack – understand taking segments away leaves a smaller amount of fruit left Playdoh – imprint numicon into playdoh, pushing down to subtract numbers	EYFS children will be taught subtraction through stories. e.g Shopping basket story book taking items away from the health. Handa's surprise the animals taking away the fruit.		Numbers 0 to 20 Subitise Evens Odds Number bonds Less than The same as One less than
EYFS - Y2				
EYFS and Year 1 **Subtracting ones: Count the remaining**.	1. Represent the first number in the tens frame. 2. Subtract the second number.	7 – 3 = 4 1. Draw a bar model and divide into the number of parts (first number). 2. Subtract by crossing out the ones (second number). 3. Count the remaining parts of the whole.	7 - 3 = 4 1. Put the largest number in your head. 2. If below 10, hold up the same amout of fingers. 3. Count backwards on your fingers from the starting number.	Equal to Less than (fewer) Least Tens Ones Subtract Take away Difference between Less than

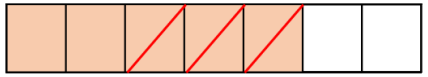
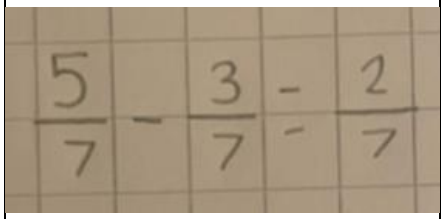
	 3. Count the remaining *Children will also explore subtracting ones by using numicon, cubes or other concrete resources. 		*Some children will be able to count backwards without support of fingers.	
<u>Year 1 & 2</u> **Subtracting ones: Counting back**	7 – 3 = 4 1. Make the larger number on the beads. 2. When counting back, push the beads away from the whole. 3. Count the remaining beads to find the answer. 	7 – 3 = 4  1. Start at the largest number 2. Jump back in ones 3. The answer is the number finished counting on. *As children progress from Year 1 to Year 2, they will be able to draw their own number line representations for counting backwards to find the answer for larger 2-digit numbers subtracting ones.	7 – 4 = 1. Put the largest number in your head. 2. Count back. *Children may use their fingers to help support when subtracting ones.	Tens Ones < > = signs Difference

				
<u>Year 1 & 2</u> **Find the difference** ***EYFS concept of finding the difference will be explored with pupils showing greater depth understanding of subtraction. Introduced via concrete resources.**	Find the difference between 14 and 6  1. Represent the whole using cubes. 2. Move the smaller number into a part.	  1. Draw or use the number line provided to count back.  2. Start at the whole, count back to the part. 3. The number landed on is the answer.  *Children may also use bar model pictorial representations to identify the difference.	Hannah has 14 sandwiches. Helen has 6 sandwiches Find the difference between the number of sandwiches.  1. Draw the part-whole model and add the numbers in. 2. Start at the smallest number. 3. Mentally, count up to the largest number. *Children may use their fingers for this. *As children become confident with subtraction in Year 2 they may find the difference using a written/mental method for subtraction.	

	 3. Count the remaining of the whole to find the difference. *EYFS concept 			
<u>Year 1 & 2</u> **Subtracting by making 10**	14 – 5 = 1. Represent the number on the tens frame.  2. Subtract the ones to make 10. 	 1. Start at largest number of the number line. 2. Partition the smallest number into the number of ones needed to subtract back to the 10 and the remaining ones. 3. Subtract back to the 10. 4. Subtract the remaining ones.	14 - 5 = Mentally: 1. Using the smallest number, subtract the number of ones needed to subtract back to the 10. 2. Subtract the remaining ones left from the smallest number.	

	3. Subtract the remaining ones. 4. Count the answer left in the tens frame. 	5. Land on the answer.		
Year 2 **Subtracting two 2-digit numbers**	54 – 22 =  1. Make the largest number using tens and ones and add to the place value chart. 2. Identify the tens and ones in the second number. 3. Subtract the ones from the chart. 4. Subtract the tens from the chart. 4. Count the remaining tens and ones to find the answer.	54 – 22 =  1. Represent the largest number using tens and ones. 2. Identify the tens and ones in the second number. 3. Cross out the ones. 3. Cross out the tens. 4. Count the remaining tens and ones for the answer.	54 – 22 = 50 – 20 = 30 4 – 2 = 2 30 + 2 = 32 *Completed mentally or written if needed.	
Year 2 **Subtracting two 2-digit numbers crossing a 10**	65 – 28 =  1. Represent the largest number using base 10.	65 – 28 =  1. Use the pictorial representation.	65 – 28 =  1. Represent the largest number in tens and ones. 2. Identify a ten needs exchanging for 10 ones and exchange.	

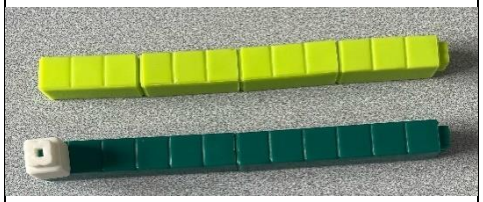
	2. Identify a ten needs exchanging for 10 ones and exchange. 2. Subtract your ones. 3. Subtract the tens. 4. Count the remaining tens and ones to find the answer.	2. Identify a ten needs exchanging for 10 ones and exchange. 2. Subtract your ones. 3. Subtract the tens. 4. Count the remaining tens and ones to find the answer.	2. Subtract your ones. 3. Subtract the tens. 4. Count the remaining tens and ones to find the answer.	
Y3 – Y6				
Year 3, 4, 5 & 6 **Column Subtraction** ***This method is applied addition of numbers up to and beyond 4 digits.**	364 – 123 =  1. Use place value counters to make the integer. 2. Identify the place value of the smallest integer. 3. Subtract the ones. 4. Subtract the tens. 5. Subtract the hundreds.  6. Count the remaining.	364 – 123 =  1. Use place value counters to make the integer. 2. Identify the place value of the smallest integer. 3. Subtract the ones. 4. Subtract the tens. 5. Subtract the hundreds. 6. Count the remaining.	364 – 123 =  1. Layout the calculation in coloum subtraction lining up the hundreds, tens and ones. 3. Subtract the ones. 4. Subtract the tens. 5. Subtract the hundreds.	Column subtraction Estimate Inverse operation Accuracy
Year 3, 4, 5 & 6 **Column Subtraction with exchanging** ***This method is applied addition of numbers up to and beyond 4 digits.**	435 – 273 =  1. Use base 10 to make the largest integer.	435 – 273 =  1. Draw the largest integer into the place value chart.	435 – 273 = 	

	2. Identify the place value of the smallest integer. 3. Subtract the ones. 4. Subtract the tens. 5. Subtract the hundreds. 6. Count the remaining. *children will exchange from the next place value column to the right of the integer.	2. Identify the place value of the smallest integer. 3. Subtract the ones. 4. Subtract the tens. 5. Subtract the hundreds. 6. Count the remaining. *children will exchange from the next place value column to the right of the integer.	1. Layout the calculation in column subtraction. 2. Subtract the ones. 3. Subtract the tens. 4. Subtract the hundreds. 5. Count the remaining. *children will exchange from the next place value column to the right of the integer.	
<u>Year 3 & 4</u> **Subtracting fractions with the same denominator**	$\frac{5}{7} - \frac{3}{7} = \frac{2}{7}$  1. Select the correct bar to represent the whole divided into the equal parts. 2. Add equal parts to show the numerator on top of the whole. 3. Subtract the parts away from the whole.  4. Count the remaining parts out of the whole to form the fraction.	$\frac{5}{7} - \frac{3}{7} = \frac{2}{7}$  1. Draw a bar model and divide equal parts identified by the denominator. 2. Shade the first fractions numerator onto the whole. 3. Subtract the second fraction's numerator 4. Count the remaining parts out of the whole to form the fraction.	 1. Subtract the numerators 2. Write the answer over the denominator (this stays the same) 3. Simplify the fraction if needed.	Tenths Equal Denominator Numerator Equivalent fractions Decimal equivalent Non-unit fraction (any fraction that isn't 1)

Year 5 & 6

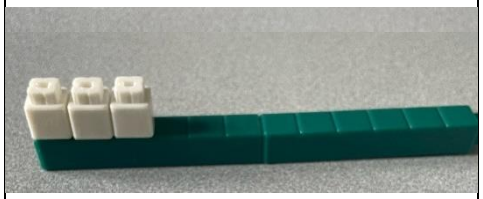
Subtracting fractions with uncommon denominators including mixed numbers

$$\frac{1}{3} - \frac{1}{12} = \frac{3}{12}$$



1. Make the fractions using cuisenaire rods.
2. Find the lowest common denominator between the denominators.
3. Convert the fractions into the same denominator and represent on the whole.

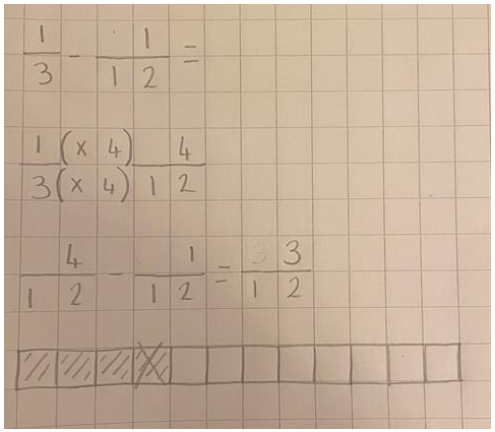
4. Subtract the numerators.

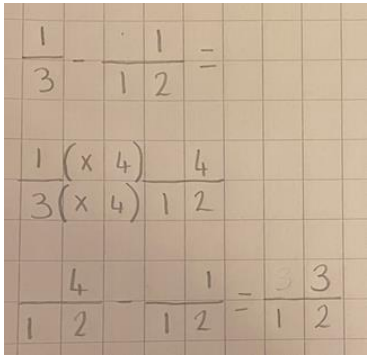


5. Count the remaining parts out of the whole.

$$\frac{1}{3} - \frac{1}{12} = \frac{3}{12}$$

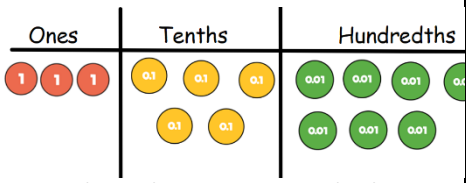
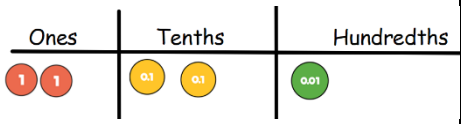
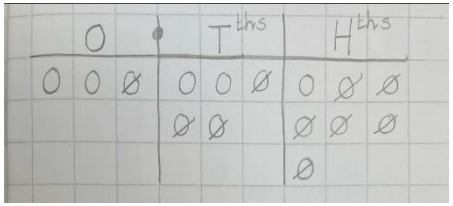
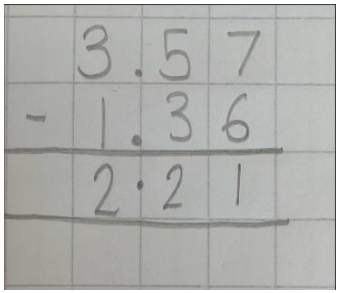
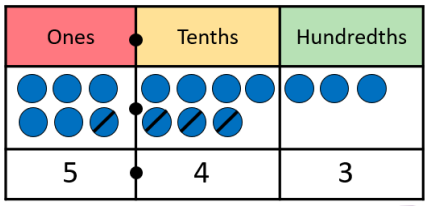
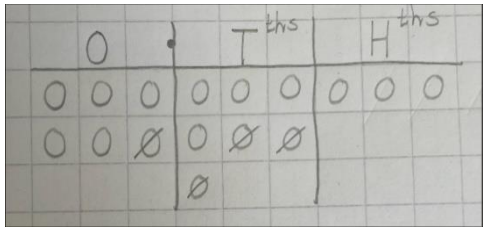
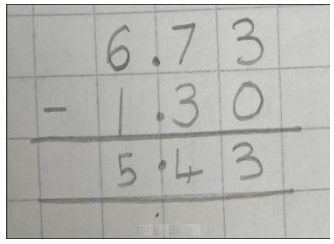
1. Convert the fractions to have the lowest common multiple.
2. Draw a bar model to represent the equal parts of the denominator.
3. Represent the numerators as parts on the bar model by shading.
4. Subtract the smallest numerator from the largest numerator.
5. Count the remaining parts out of the whole for the answer.





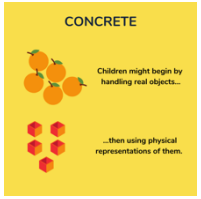
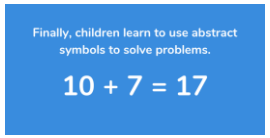
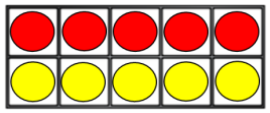
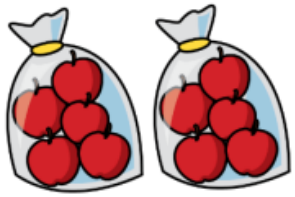
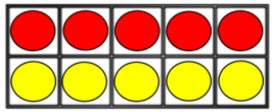
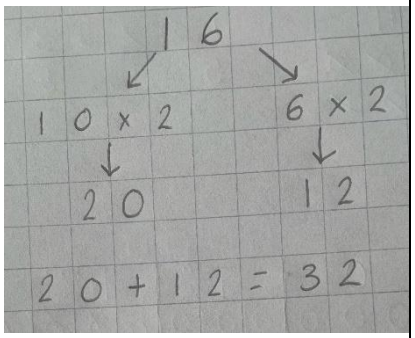
1. Find the lowest common multiple between the fractions.
2. Convert the fractions to have the same denominator.
3. Subtract the lowest numerator from the largest numerator.
4. Write the answer.

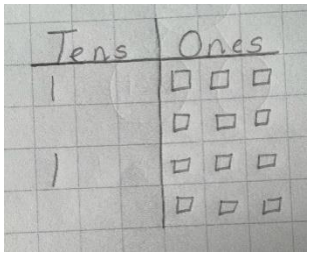
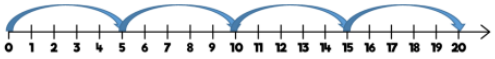
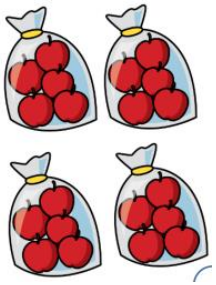
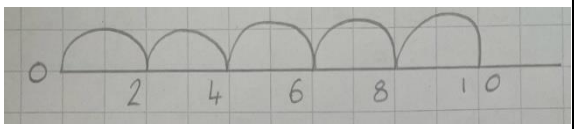
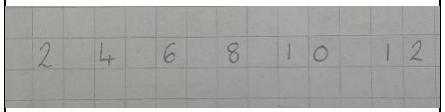
Multiples
Mixed number
Improper fractions
Thousandth
Tenths
Hundredths
Simplify

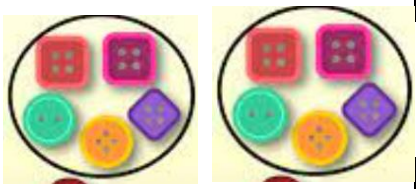
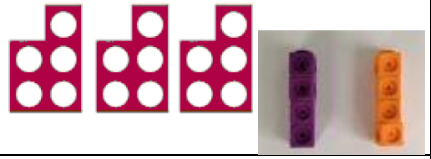
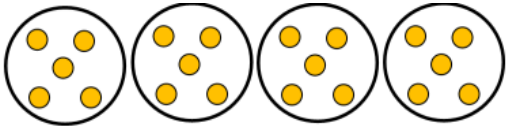
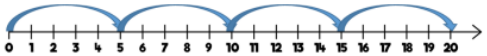
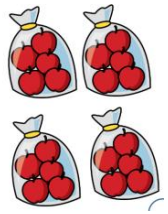
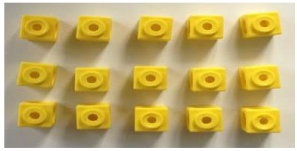
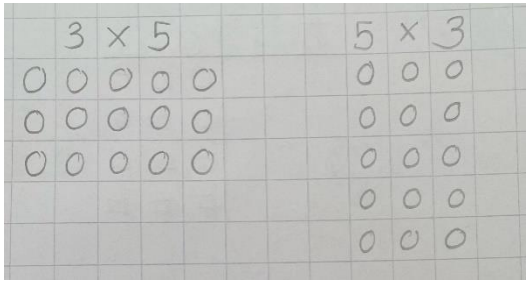
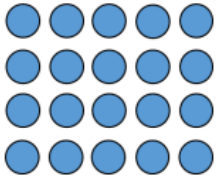
Year 5 & 6 **Subtracting decimals with the same number of decimal places**	3.57 – 1.36 =  1. Use place value counters to make the integer. 2. Subtract the hundredths. 3. Subtract the tenths. 4. Subtract the ones.  5. Count the remaining for the answer. *Children will also apply exchanging where needed.	3.57 – 1.36 =  1. Draw place value counters on a chart to make the integer. 2. Subtract the hundredths. 3. Subtract the tenths. 4. Subtract the ones. *Children will also apply exchaning where needed.	3.57 – 1.36 =  1. Set out the calculation using column subtraction. 2. Subtract the hundredths. 3. Subtract the tenths. 4. Subtract the ones. *Children will also apply exchanging where needed.	
Year 5 & 6 **Subtracting decimals with different number of decimal places**	6.73 – 1.3 =  1. Use place value counters to make the integer. 2. Subtract the hundredths. 3. Subtract the tenths. 4. Subtract the ones.	6.73 – 1.3 = 	6.73 – 1.3  1. Write the calculation in column subtraction. 2. Add in the decimal point. 3. Add a 0 to show where there is no integer in the number. 2. Subtract the hundredths.	

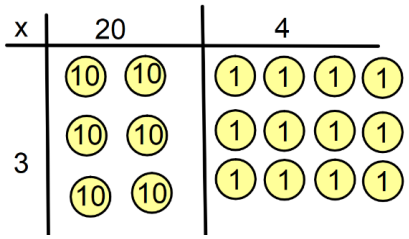
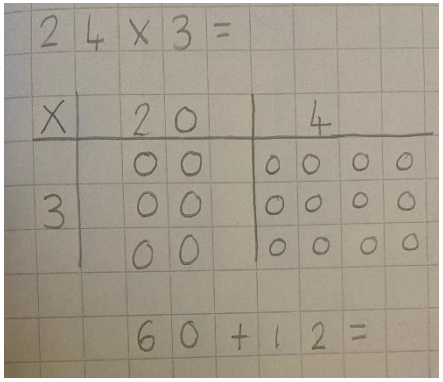
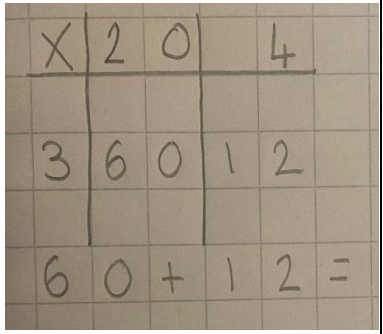
	*Children will also apply exchanging where needed.	1. Draw place value counters on a chart to make the integer. 2. Subtract the hundredths. 3. Subtract the tenths. 4. Subtract the ones. *Children will also apply exchanging where needed.	3. Subtract the tenths. 4. Subtract the ones. *Children will also apply exchanging where needed.	

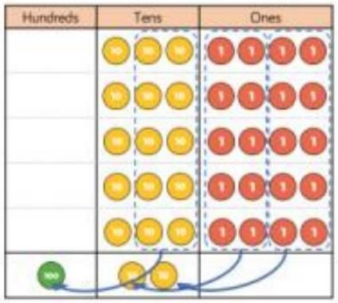
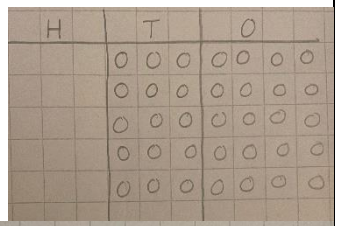
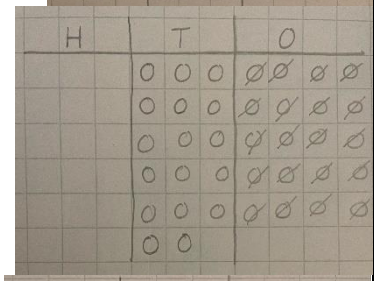
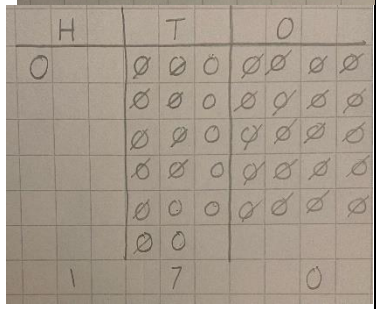
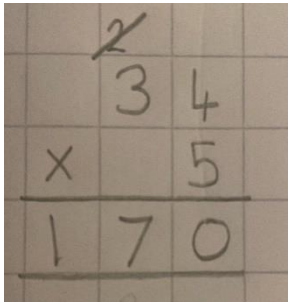
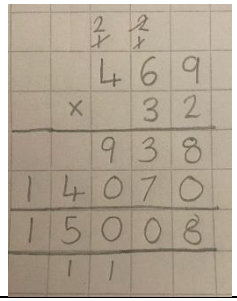
Multiplication

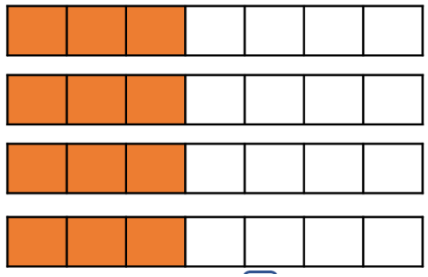
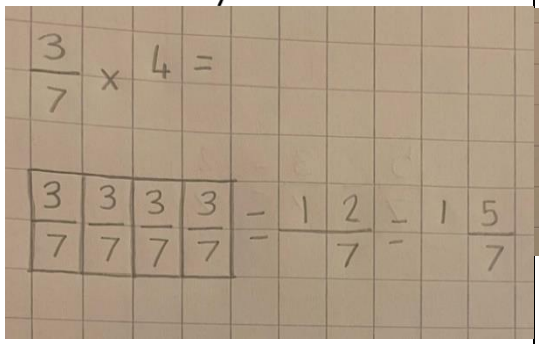
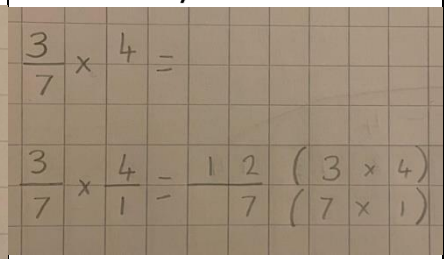
Objective and strategy	Concrete	Pictorial	Abstract	Key Vocabulary
				
EYFS - Y3				
EYFS, Year 1, 2 & 3 **Doubling**	Double 5  1. Represent the number twice in chosen resource. 2. Count the total. *Children will also use numicon, tens frames and counters. *In EYFS a range of concrete resources to be used across provision e.g. butterfly wings, lining up shoes, mirror doubling	Double 5  1. Count the total to find the answer.  1. Draw the number in the tens frame/bar model	Double 16  1. Partition number into tens and ones. 2. Multiply each number by 2. 4. Add both numbers together.	Double Doubling Arrays Number pattern Counting in two's, fives and tens

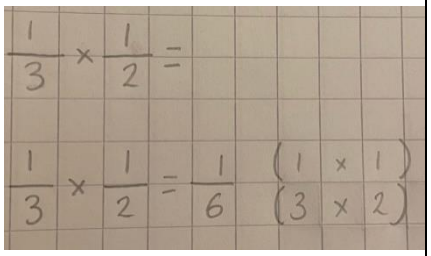
		2. Add the same number again in the tens frame/bar model 5. Count the total. Double 16  1. Draw tens and ones to represent the number. 2. Repeat and draw tens and ones for the same number. 3. Count the total tens and ones.	**"Partition** **Multiply** **Re-combine"** *Children will be able to progress to parition mentally and complete efficently using mental arithmetic.	
<u>Year 1, 2 & 3</u> **Counting in multiples**	Counting in multiples    Children will use concrete resources to count in multiple.	Counting in multiples    Children will use number lines or pictures to support their counting in multiples.	Counting aloud in multiples. 2, 4, 6, 8… Write sequences of numbers counting in mulitples  	Arrays Number pattern Counting Repeated addition Multiply Divide Division

		They may use the number line provided or draw their own.		
Year 1, 2 & 3 **Repeated addition**	5 + 5 =  1. Create the equal groups with the equal number in each. 2. Verbally say the repeated addition 3. Count the total in ones or in known counting pattern. *Children will use a range of concrete resouces e.g. tens frames, counters, objects, cubes 	5 + 5 + 5 + 5  1. Draw equal groups to show the repeated addition.  2. Use the number line provided or draw their own to shown the repeated addition. 3. One jump of the multiple.	 1. Recognise how many is in each equal group. 2. Recognise how many groups there is. 3. Write the repeated addition sentence 4. Count the total in ones or in known counting pattern.	Arrays Number pattern Counting Repeated addition Multiply Divide Division
Year 1, 2 & 3 **Arrays** ***To understand commutativity with multiplication**	3 x 5 or 5 x 3  1. Say the sentence __ groups of __ 2. Arrange into 1 equal group of ___ 3. Add equal groups of ___ to the array until total number of groups made. 4. Children to count in counting pattern to find the total.	3 x 5 or 5 x 3  1. Read the number sentence.	 1. Identify the groups and number in each equal group. 2. There are ____ groups of ____ 3. Write the repeated addition	

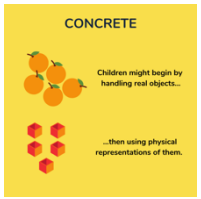
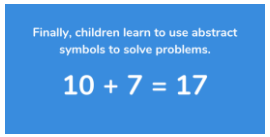
	*Children to understand the array either shows 3x5 or 5x3	2. ____ groups of _____ 3. Draw the 1st group. 4. Repeat until the correct groups are drawn.		
Year 3 **Grid Method Multiplication**	24 x 3 =  1. Partition the largest number into place value. 2. Use counters to create arrays to show the multiplications. 3. Count the total. *Children will progress to using base 10 representing tens as 1 stick of ten where needed.	24 x 3 =  1. Draw out the place value chart to partition the largest number. 2. Draw an array to represent the multiplications 3. Add up the columns and add together.	24 x 3 =  1. Draw the grid partition the largest number. 2. Calculate the multiplications in the grid. 4. Add the answers together. *As children begin multiplying numbers with more than 2 digit they will represent using the same method, however showing hundreds/tens/ones for example for a 3-digit number.	Arrays Number pattern Counting Repeated addition Multiply Divide Division

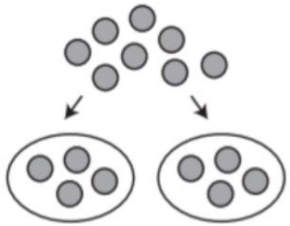
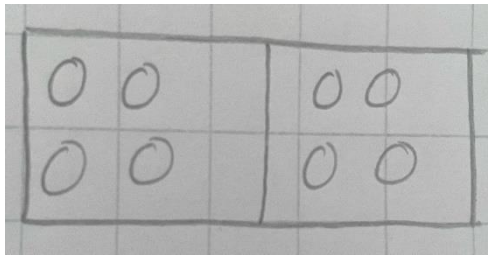
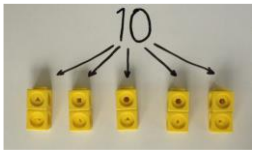
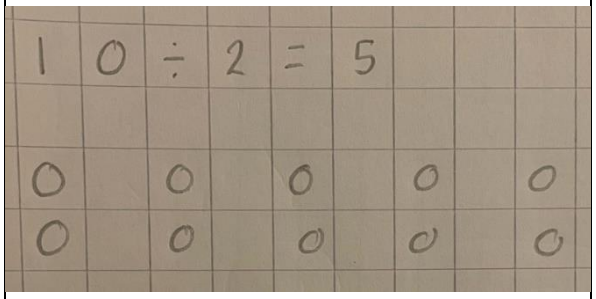
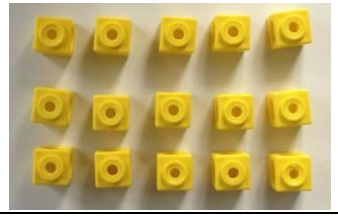
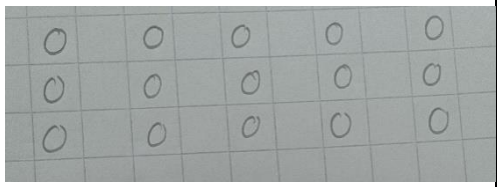
Year 4, 5 & 6 **Column Multiplication**	34 x 5 =  1. Create ____ groups of the largest number in the place value chart. 2. Exchange where needed. 4. Count the total.	34 x 5 = 170 1. Partition the largest number into equal groups of ____.  2. Exchange (if needed)  3. Count the columns for the answer.  	34 x 5 =  1. Set the calculatiion out in coloumn multiplication. 2. Multiply the ones. 3. Multiply the tens. 4. Underline the answer. *Children will carry above into the correct column. *As children progress through multiplication they will multiply numbers with more than 2 digits together. See example below:  	Multiplicatio n facts Division facts Multiplying Dividing Factor pairs Multiples Factors Prime numbers Composite numbers Square numbers Cube numbers Integer Common factors Common multiples Prime numbers

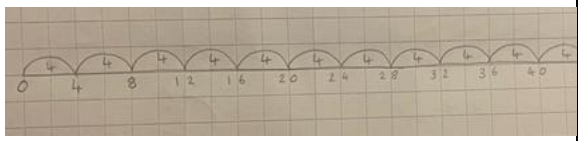
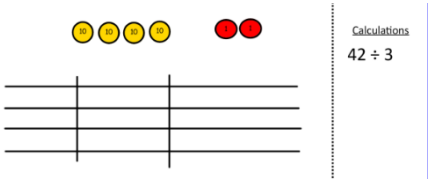
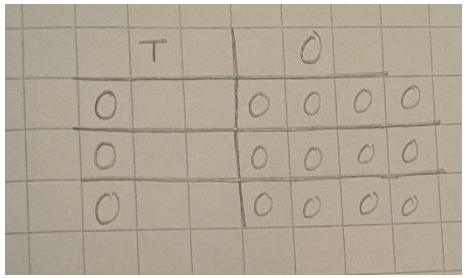
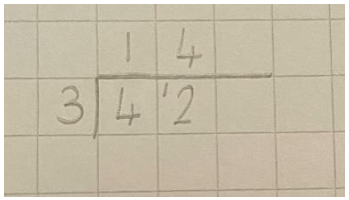
Year 5 & 6 **Multiplying Fractions by integer**	$\frac{3}{7} \times 4 =$  1. Represent the fraction using a bar model. 2. Understand you are multiplying the fraction by the integer – this is how many times it needs to be repeated (link to repeated addition) 3. Create the repeated addition bar models. 4. Count up the shaded fractions and write  the answer. $\frac{3}{7} \times 4 = \frac{12}{7} = 1\frac{5}{7}$ 5. Convert to a mixed number or simplyfy.	$\frac{3}{7} \times 4 =$  1. Draw a bar model to show how many times the fraction requires to be repeated. (Make links to repeated addition) 2. Write the fraction in each part of the model. 3. Add the numerators together (repeated addition). 4. Multiply the denominator by 1. 5. Write the fraction.	$\frac{3}{7} \times 4 =$  1. Make the integer into a fraction with a denominator of 1. 2. Multiply the numerators. 3. Multiply the denominators. 4. Simplify the fraction or convert to a mixed number, when needed.	Multiples Mixed number Improper fractions Thousandth Tenths Hundredths Simplify

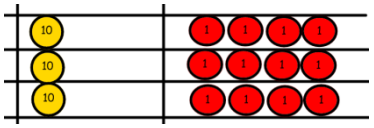
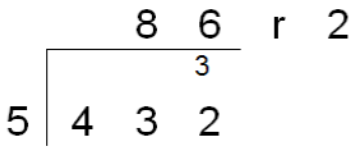
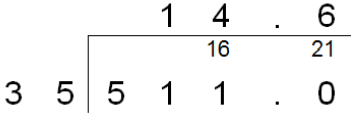
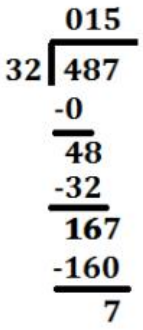
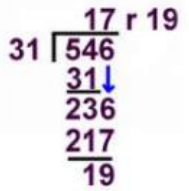
Year 5 & 6 **Multiplying fractions by fractions** ***Children will progress straight to being taught the most efficient method.**			 1. Multiply the numerators. 2. Multiply the denominators. 3. Simplify, where needed.	

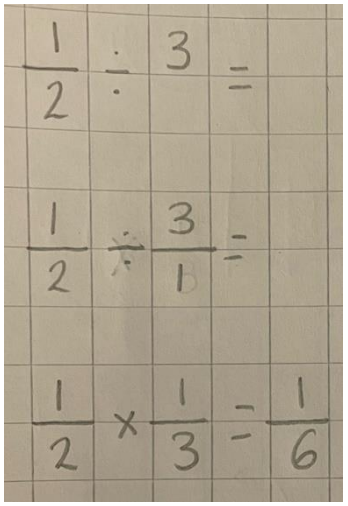
Division

Objective and strategy	**Concrete**	**Pictorial**	**Abstract**	**Key Vocabulary**
				
EYFS	EYFS pupils will use concrete resources in maths lessons and continuous provision to understand the concept of sharing equally between a number of groups. Intially only 2 groups. e.g. hoops and beanbags outside, playdoh, natural objects, snack table.	EYFS will learn the concept of sharing through stories which explore sharing. Stretch pupils understanding here to sharing between more than 2 groups. e.g. There's somebody at the door story, sharing the cookies. Adults reenact this for concrete understanding using real cookies.		
Y1 – Y3				
Year 1 & 2 **Sharing objects into groups**	8 shared by 2	8 ÷ 2 = 4	8 ÷ 2 = 4 *Children will be able to use times table recall to answer division.	Arrays Number pattern

	 1. Count out the whole. 2. Share into equal groups. 3. Count the total of the group.	 1. Draw a bar model. 2. Divide into equal parts. 3. Share equally. 4. Count the total of the group.		
<u>Year 1 & 2</u> **Division as grouping**	 1. Count out 10 counters. 2. Group the counters into groups of 2. 3. Count how many groups made.	 1. Draw a bar model and divide into equal groups. 2. Share the	10 ÷2 = 5 *Children will be able to use times table recall to answer division.	
<u>Year 1, 2 & 3</u> **Division with arrays**	15 ÷ 3 = 5 	15 ÷ 3 = 5 	15 ÷ 3 = 5 *Children will be able to use times table recall to answer division.	Divide Division Share Groups of

	1. Count out the whole. 2. Divide the counters into rows of __ 3. Count how many equal rows of ____	*Children can either use the pictorial representation given or draw the array. 1. Draw 1 group of _____ 2. Repeat by counting in multiple until whole is reached. 3. Count how many equal groups made.		
Y3-Y6				
Year 3 & 4 **Division with a remainder**	53 ÷ 4 = 1. Represent the dividend in place value counters.  2. Exchange if needed, to share equally into each row. 3. Share the place value counters equally into the rows. 4. Leave the remainders out.	53 ÷ 4 =  1. Draw a number line from 0 to the dividend number. 2. Count up in the divisor. 3. Reach the highest multiple closest to the dividend. 4. Add the remaining jumps in ones. 5. Combine the number of jumps in multiples and ones.	$53 \div 4 = 13\ r1$ 1. Use knowledge of ___ times table to count up to the nearest multiple. 2. Count the remaining to reach the dividend.	Multiplication facts Division facts Multiplying Dividing Factor pairs Remainders
Year 3, 4, 5 & 6 **Short Division**	42 ÷ 3=  1. Make the dividend out of place value counters on the grid. 2. Divide the grid into the number of rows shown in the dividend.	42 ÷ 3=  1. Draw out the grid with rows to represent the divided. 2. Divide out the number equally into each row.	42 ÷ 3= 1. Draw the short division grid.  2. Write largest number in the grid. 3. Write divisor to the left 4. Divide each number by the divisor Children will exchnage if needed.	Multiples Factors Prime numbers Composite numbers Square numbers Cube numbers Integer

	3. Partition the dividend and add to the place value grid. 4. Exchange if needed. 6. Add the place value counters in 1 row for the answer. 	3. Exchange where needed. 4. Add the place value counters in 1 row for the answer.	  *Children will progress to using short division for division with remainders and divisions using decimal places to divide the total accurately.	
<u>Year 6</u> **Long Division**			Children will use long division to divide numbers with up to 4 digits by 2 digit  	Multiples Factors Prime numbers Composite numbers Square numbers Cube numbers Integer

			numbers. *Children will progress to using short division for division with remainders and divisions using decimal places to divide the total accurately.	
<u>Year 6</u> **Divide fractions by an integer** ***Children will go straight to being taught the most efficient method**.			 1. **Keep** the first fraction the same. Add a denominator of 1 to the intger to create a fraction. 2. **Change** the division symbol to a multiplication symbol 3. **Flip** the second fraction (swap the numerator and denominator over)	

Hallam Primary School Non-Negotiable Vocabulary

This is the vocabulary taken from the National Curriculum that children must understand in order to calculate and solve problems. There will be additional language used in maths lessons alongside this.

	Number					**Geometry**				
	Number and place value	Addition and subtraction	Multiplication and division	Fractions (including decimals and percentages)	Measurement	Properties of shape	Position and direction	Statistics	Ration and proportion	Algebra
EYFS	Numbers 0 to 20 Subitise Evens Odds Number bonds	Greater than Less than The same as One more than One less than	Double Doubling		Length Weight Capacity	Patterns	Rotate			
Year 1	Equal to More than Less than (fewer) Most Least Tens Ones	Add Subtract Altogether Total Take away Difference between More than Less than	Arrays Number pattern Counting in two's, fives and tens	Half Quarter	Long/Short Longer /Shorter Tall /Short Double /Half Heavy/light Heavier than/lighter than Full/empty More than/less than Half full/quarter full	Rectangles (including squares) Circles Triangles Cuboids (including cubes)	Left and right Top Middle Bottom On top of In front of Above Between Around Near Close/Far Forwards Backwards Inside Outside Half turn			

							Quarter turn			
Year 2	Tens Ones < > = signs	Sum Difference	2,5,10 times tables Repeated addition	Third Two quarters Three quarters Sharing Grouping	m/cm kg/g Degrees C L/ml < > = £ p 'Half as high' 'Twice as wide'	Sides Edges Vertices Faces Prism	Rotate Right angle (quarter) Clockwise Anti-clockwise	Pictogram Tally chart Table		
Year 3	Hundreds, tens and ones Partition	Column addition Column subtraction	3, 4 and 8 times tables Multiply Divide Multiplication Division Short multiplication Short division	Tenths Equal Denominator Numerator	Mass Volume Capacity Perimeter Roman numerals I to XII 12 hour clock 24 hour clock Estimate Analogue Digital	Orientation Angles Right angle Horizontal Vertical Perpendicular Parallel Polygon		Bar chart Pictogram Interpret Present		
Year 4	Negative numbers Thousands, hundreds, tens and ones Rounding Roman numerals to 100 (C)	Estimate Inverse operation	Multiplication facts Division facts Multiplying Dividing Factor pairs	Equivalent fractions Decimal equivalent Non-unit fraction (any fraction that isn't 1)	Conversion Area (rectilinear shapes) Estimate Compare Calculate	Classify Acute angles Obtuse angles Symmetric figure Isosceles Equilateral Scalene	First quadrant Translation Plot points Axes Equal scale	Discrete Continuous Time graph Sum and difference problems		
Year 5	Powers Roman numeral to 1000 (M)	Accuracy Remainders Long division	Multiples Factors Prime numbers	Multiples Mixed number	Metric Imperial Equivalences	Regular polygon Irregular polygons	Reflection Translation Coordinates			

	Linear number sequence		Composite numbers Square numbers Cube numbers Integer	Improper fractions Thousandth Tenths Hundredths Simplify	Perimeter of composite shapes					
Year 6	Intervals		Common factors Common multiples Prime numbers	Simplify Degree of accuracy		Radius Diameter Circumference	Equal scaling Four quadrants	Pie chart Line graph Mean	Quantities Scale factor	Formulae Variables