Swain House Primary School Calculation Policy

The policy has been designed in accordance with the National Curriculum 2014.

It helps to develop the three main aims: fluency, reasoning and problem solving.

It is designed to give pupils consistent and smooth progression of learning when using the four main operations.

The teaching of mathematics (including using formal strategies) should be built upon the aim of ensuring children's understanding. For this reason, key concepts, models, images, examples of practical equipment have all been included to support teachers when planning for the new curriculum. The use of practical equipment should be ingrained into the teaching of maths:

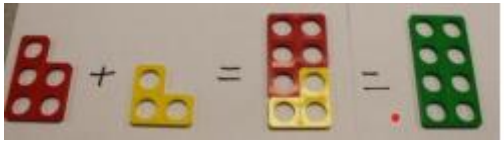
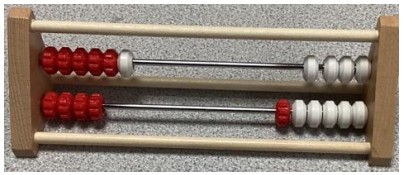
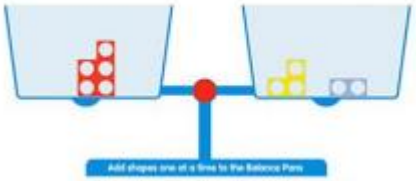
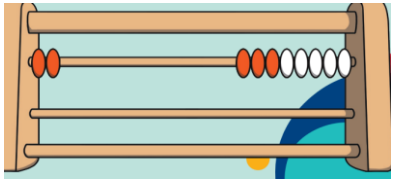
- as equipment for children to use;
- as visual aids for children in the classroom - displays/working wall;
- as part of teacher modelling/demonstration when introducing new concepts/topics;
- Finally, more able children should use equipment to ensure they can explain why/how (fluency and reasoning).

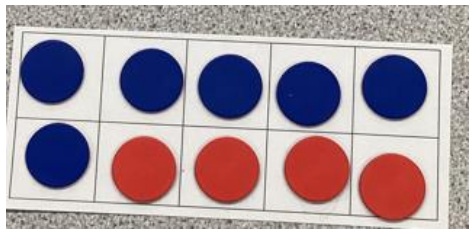
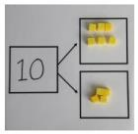
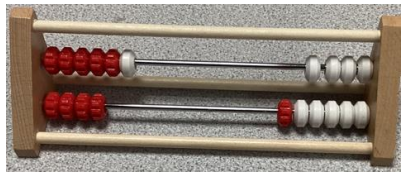
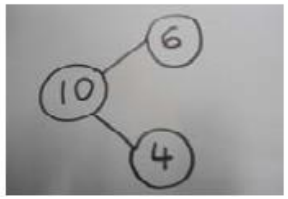
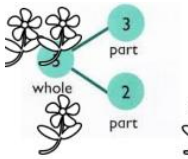
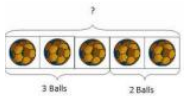
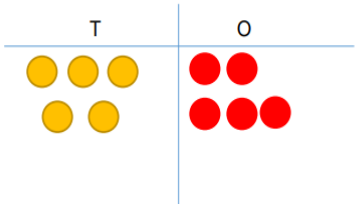
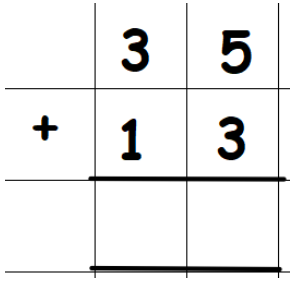
Although the calculation policy is arranged by year group expectations for the National Curriculum 2014, it is vital that children are taught according to the stage they are at. Children need to be secure with certain key concepts which underpin calculation strategies. When introducing a new strategy, ask children to compare it with strategies they may have previously learnt. Children need to be taught to select strategies with consideration. "Should I use decomposition for 1001 – 999?" How is formal multiplication similar to partitioning?

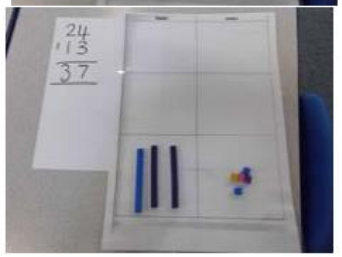
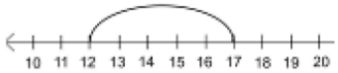
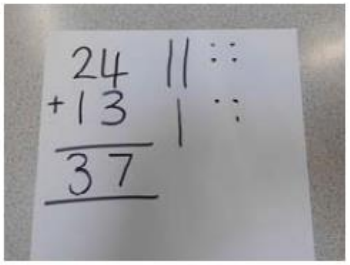
Addition

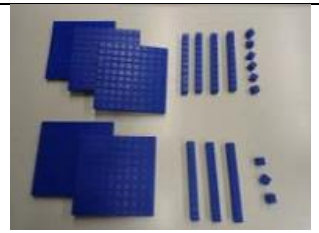
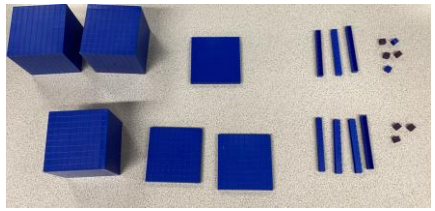
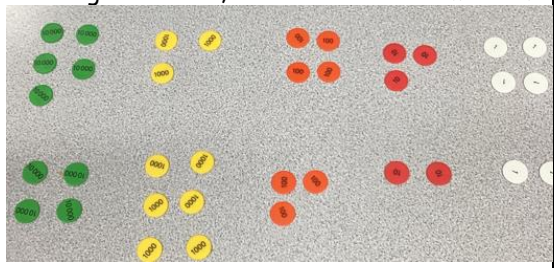
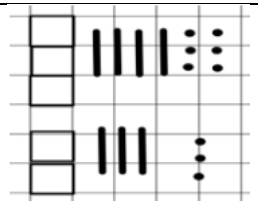
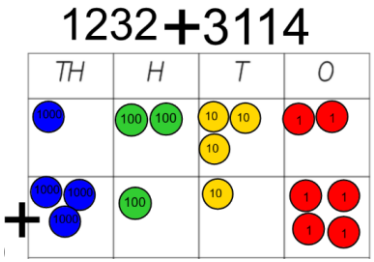
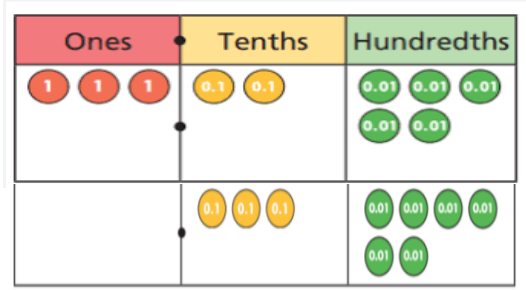
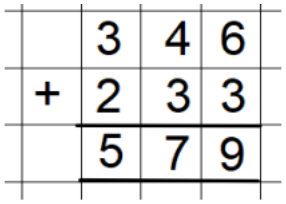
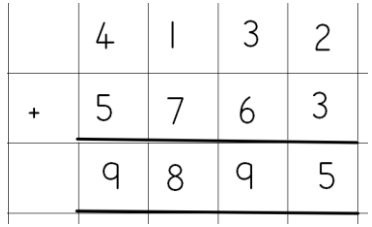
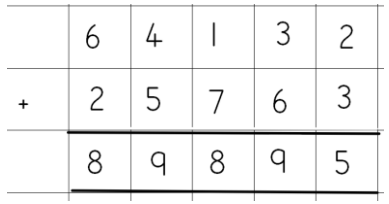
Year One	Year Two	Year 3
• read, write and interpret mathematical statements involving addition (+) and equals (=) signs. • represent and use number bonds within 20 • add one-digit and two-digit numbers to 20, including zero. • solve one-step problems that involve addition, using concrete objects and pictorial representations, and missing number problems	solve problems with addition using concrete objects and pictorial representations, including those involving numbers, quantities and measures and applying their increasing knowledge of mental and written methods • recall and use addition facts to 20 fluently, and derive and use related facts up to 100 add numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones, a two-digit number and tens, two two-digit numbers, adding three one-digit numbers. • show that addition of two numbers can be done in any order (commutative)	add and subtract numbers mentally, including: a three digit number and ones, a three-digit number and tens, a three-digit number and hundreds • add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction • estimate the answer to a calculation and use inverse operations to check answers • Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.

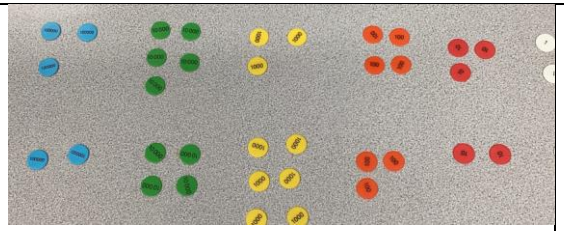
	• recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	
Year 4 • add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate • estimate and use inverse operations to check answers to a calculation • solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	**Year 5** • add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • add and subtract numbers mentally with increasingly large numbers • use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.	**Year 6** • perform mental calculations, including with mixed operations and large numbers • use their knowledge of the order of operations to carry out calculations involving the four operations • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

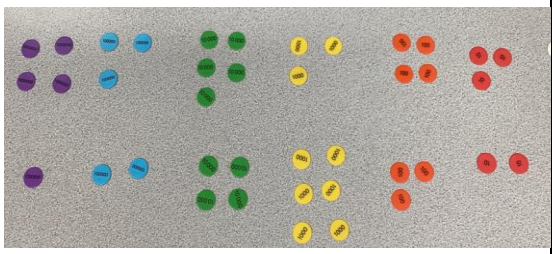
Objective	Year Group	Concrete	Pictorial	Abstract
	EYFS	 Use Numicon to identify two different numbers and add them together to make the total.  Use rekenreks to make numbers and to add two numbers together to equal a total.	 Use images of numicon to represent how two digits add together to equal a total.  Use pictures and images of rekenreks to represent numbers and adding two numbers together.	2 + 3 = 3 + 1 =

Addition without regrouping	**Key Stage One**	 Use tens frames and double sided counters to make 10 and numbers up to 10.    Use cubes to add two numbers together as a group or in a bar.   Use rekenreks to show and solve addition sentences for numbers within and up to 10 and also 20.	  Use of images, pictures and numbers as part of a part-whole model.   Use pictures to add two numbers together as a group or in a bar.  After practically using the base 10 blocks and place value counters, children can draw the counters to help them to solve additions. 	6 + 4 = 5 + 2 = 5 + 4 = Write the answers using known facts and strategies.  Use column method for addition of ones and then tens for two digit numbers. 24 + 13 = 37 13 + 24 = 37 37 = 24 + 13 37 = ☐ + 13 24 + ☐ = 37 Children use known facts and strategies.

		 Use bead strings to represent and complete number bonds for numbers within and up to 10 and 20.   Using Base 10 apparatus for TO + TO (beginning to set out in columns and recorded as expanded column addition)	12 + 5 = 17  Start at the larger number on the number line and count on in ones or in one jump to find the answer.  Use a line to represent Tens, dots to represent ones. Add the ones first and then add the tens.	

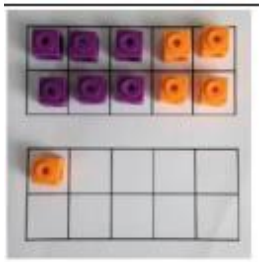
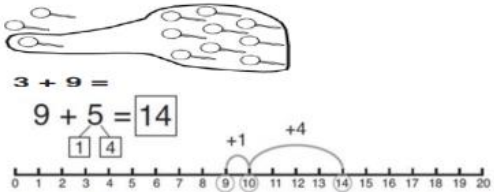
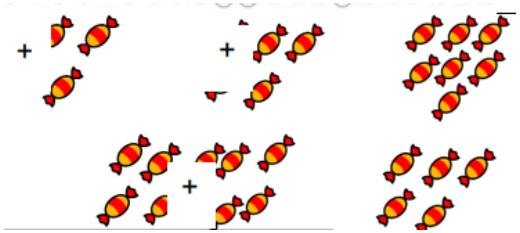
	Key Stage Two	  Add together the ones first, then add the tens and finally add the hundreds. Use the Base 10 blocks first before moving onto place value counters. Use place value counters in the correct position of its numerical value when calculating- involving thousands, ten thousands and millions. 	 Use pictorial representation- squares for hundred, lines for tens and dots for ones. Start with adding the ones, then the tens and finally the hundreds. Use and draw images of place value counters to show representations and calculations of additions.  Use and draw images of place value counters when completing additions with decimals. 	 Use known number facts to solve the calculation starting with adding the ones, then the tens and finally the hundreds. Method to remain the same with progression through the increase in value of numbers.   Introduce column method when calculating additions involving decimals and money.



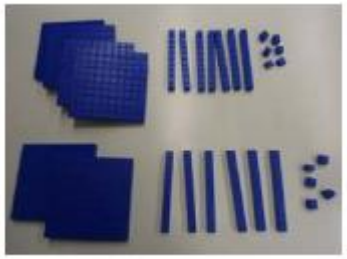
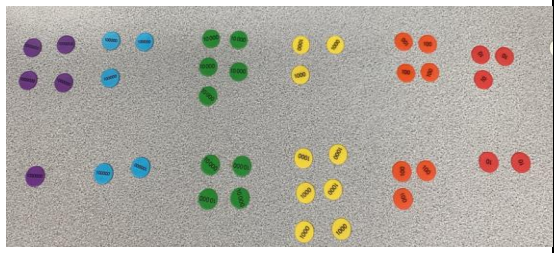
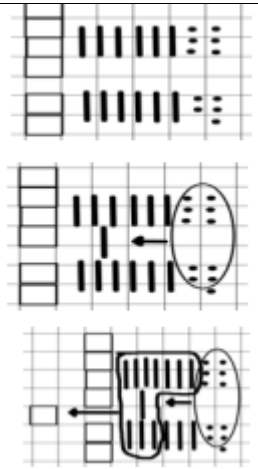
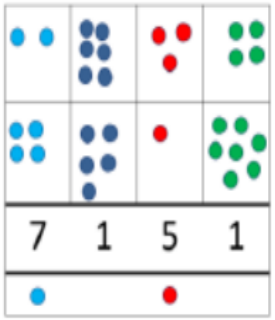
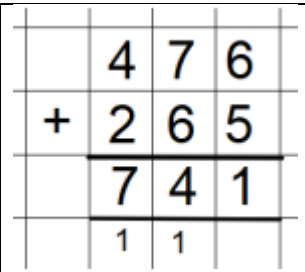
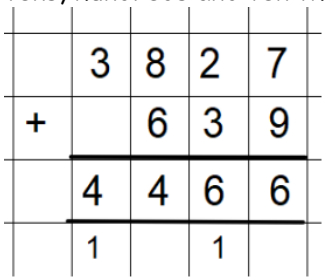
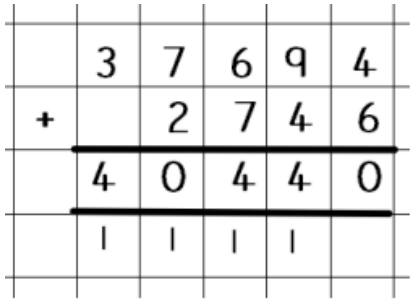


	1	3	.	2		
+		5	.	4		

		7	1	3	.	2
+		3	8	5	.	4

Addition with regrouping	**Key Stage One**	 6 + 5 = 11 Number strings to make a 10 and then add one more.  Start with the bigger number and use the smaller number to make 10. 4 + 7 + 6= 17 Put 4 and 6 together to make 10. Add on 7.  Adding 3 numbers together to make a 10.	 3 + 9 = 9 + 5 = 14 1 4 +1 +4 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 Use images and number lines to model grouping a ten and then adding the remaining ones.  Adding images and pictures together to show a combined ten and the remaining ones. Add these together for the final total.   	7 + 4= 11 If I am at seven, how many more do I need to make 10. How many more do I add on now? 4 + 7 + 6 = 10 + 7 10 = 17 Combine the two numbers that make 10 and then add on the remainder. | | 3 | 5 | | + | 1 | 6 | | | | | Use the regrouping strategy to answer these calculation types.

		   Use Base 10 to make both numbers using ten sticks and ones. Add the ones and exchange ten ones for one ten and place that ten in the tens column. Count the remaining ones and add the remaining tens together to calculate the final answer.	Use lines to represent tens and dots to represent ones. Add the ones together and exchange ten ones for one ten and draw this in the tens column. Count the remaining ones and write the answer in the ones coloumn. Add the remaining tens and write the answer in the tens column.	27 + 15 = 42 15 + 27 = 42 42 = 27 + 15 42 = □ + 15 27 + □ = 42 Use regrouping strategy to find the missing numbers.

	Key Stage Two	 Add the ones and exhange 10 ones for 1 ten and regroup this in the tens column. Add the tens and exchange 10 tens for 1 hundred and regroup this in the hundreds column.  Use place value counters when numbers increase into thousands, ten thousands and millions. Exchange the correct amount of ones, tens, hundreds, thousands, ten thousands and millions using place value knoweldge and regroup them into the correct coloumn.	 Use squares to represent hundred, lines for tens and dots for ones. Add the ones and exhange 10 ones for 1 ten and regroup this in the tens column. Add the tens and exchange 10 tens for 1 hundred and regroup this in the hundreds column. Children can draw a pictoral representation of the columns and place value counters to further support their learning and understanding.  7 1 5 1	 Use regrouping strategy by regrouping a ten or hundred in the correct place value column. Use written column method to regroup tens, hundreds and ten thousands.   Use same column method for adding three numbers.

	4	7	6	
+	2	6	5	
	7	4	1	
	1	1		

	3	8	2	7
+		6	3	9
	4	4	6	6
	1		1	

	3	7	6	9	4
+		2	7	4	6
	4	0	4	4	0
	1	1	1	1	

	7	4	9	9
	1	4	9	7
+		3	2	9
	9	3	2	6
	1	2	2	

Same method using column method for decimals and money.

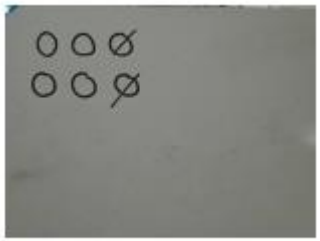
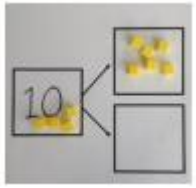
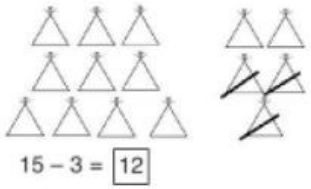
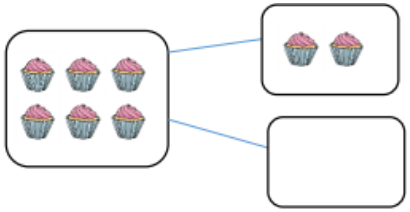
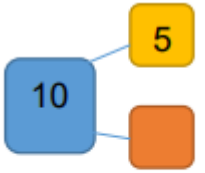
	3	.	5		
+	1	.	8		
	5	.	3		
	1				

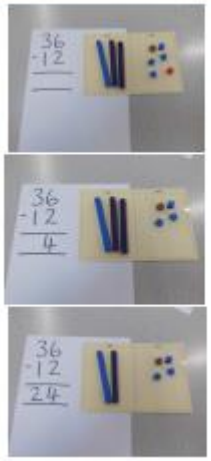
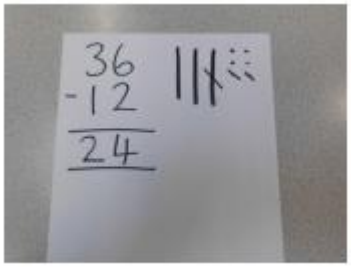
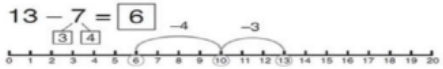
		8	3	.	5
+		4	9	.	8
	1	3	3	.	3
		1	1		

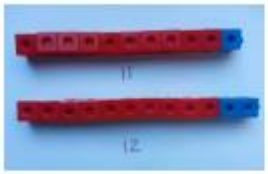
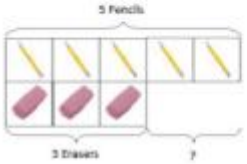
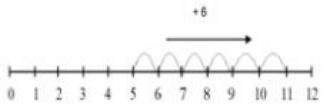
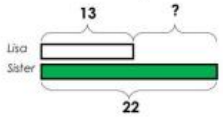
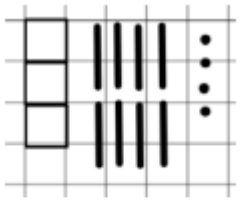
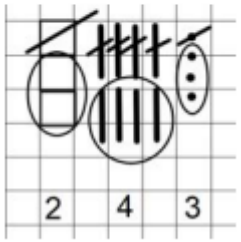
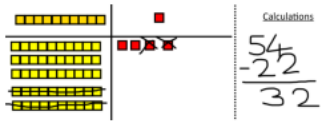
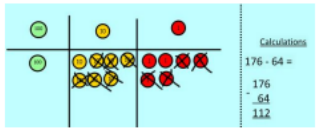
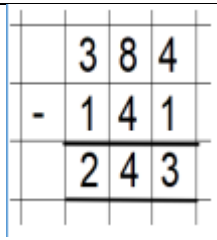
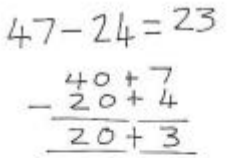
Subtraction

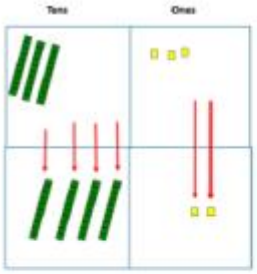
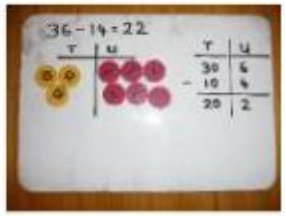
Year 1	Year 2	Year 3
• Read, write and interpret mathematical statements involving subtraction (-) and equals (=) signs. • Represent and use number bonds within 20 • Subtract one-digit and two-digit numbers to 20, including zero. • Solve one-step problems that involve subtraction, using concrete objects and pictorial representations, and missing number problems.	• Solve problems with subtraction using concrete objects and pictorial representations, including those involving numbers, quantities and measures and applying their increasing knowledge of mental and written methods • Recall and use subtraction facts to 20 fluently, and derive and use related facts up to 100 subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones, a two-digit number and tens, two two-digit numbers. • Show that subtraction of two numbers can be done in any order (commutative) • Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	• Add and subtract numbers mentally, including: a three digit number and ones, a three-digit number and tens, a three-digit number and hundreds • Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction • Estimate the answer to a calculation and use inverse operations to check answers • Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.
Year 4	**Year 5**	**Year 6**
• Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate • Estimate and use inverse operations to check answers to a calculation • Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	• Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • Add and subtract numbers mentally with increasingly large numbers • Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.	• Perform mental calculations, including with mixed operations and large numbers • Use their knowledge of the order of operations to carry out calculations involving the four operations • Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

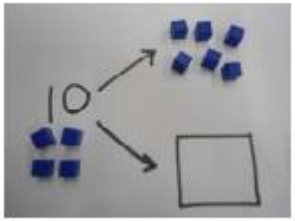
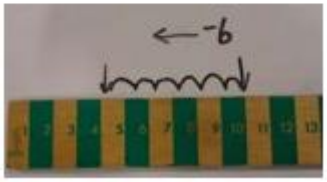
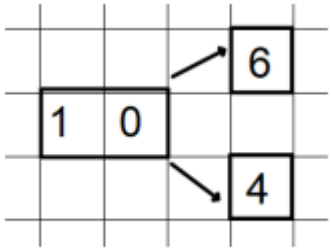
Objective	Year Group	Concrete	Pictorial	Abstract

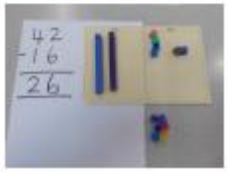
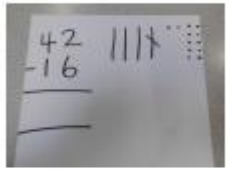
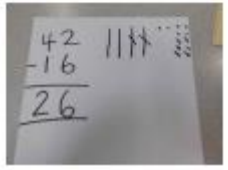
Subtraction without regrouping	**Early years**	6 - 2 = Use physical objects to show how objects can be taken away.  		6 – 2 = 4
	Key Stage One	Use physical objects, counters, cubes etc to show how objects can be taken away.  6 – 2 = 4  Part-Part whole method: Link to addition- use the part whole model to help explain the inverse between addition and subtraction. If 10 is the whole and 6 is one of the parts. What is the other part? 10 - 6 =  	Cross out drawn objects to show what has been taken away.  15 – 3 = 12 Use a pictorial representation of objects to show the part part whole model. 	18 - 3 = 15 8 – 2 = 6  Move to using numbers within the part whole model.

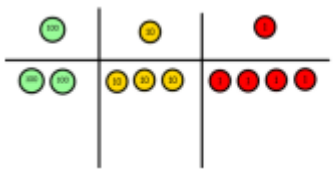
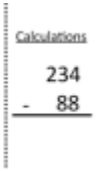
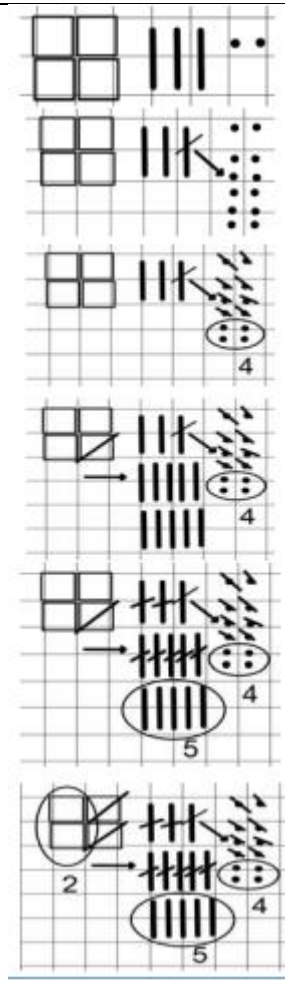
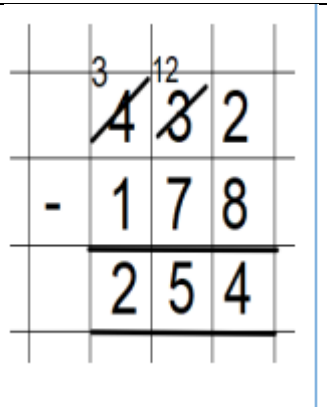
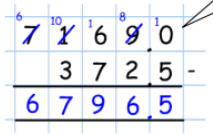
		Use Base 10 to take away. We always take away the ones first.  <u>Making 10 strategy</u> 14 – 9 = Make 14 on the ten frame. Take away the four first to make 10 and then takeaway one more so you have taken away 5. You are left with the answer of 9 	We draw the tens and ones in our books. We always take away the ones first.   Start at 13. Take away 3 to reach 10. Then take away the remaining 4 so you have taken away 7 altogether. You have reached your answer.	This will lead to a clear written column subtraction  Pupils will also be able to work out: 16 – 8 = How many do we take off to reach the next 10? How many do we have left to take off? Pupils can start to do this strategy mentally.

		<u>Find the difference</u> Compare amounts and objects to find the difference.  Use cubes to build towers or make bars to find the difference  Use basic bar models with items to find the difference	 Count on to find the difference. Draw bars to find the difference between 2 numbers. **Comparison Bar Models** *Lisa is 13 years old. Her sister is 22 years old. Find the difference in age between them.* 	Hannah has 23 sandwiches, Helen has 15 sandwiches. Find the difference between the number of sandwiches. 23 – 15 = 8 The difference between 23 and 15 is 8.
Subtraction without regrouping	**Key Stage Two**	384 — 141 = 243 Remember to: • Write one number per square. • Write each digit in the correct place value column (H, T, O). • Subtract your ones column first. • Write the answer in the correct place underneath the column. • Repeat subtracting the tens then hundreds	   Draw the Base 10 or place value counters alongside the written calculation to help to show working. 	  This will lead to a clear written column subtraction. 

		    Use Base 10 to make the bigger number then take the smaller number away. Show how you partition numbers to subtract. Again make the larger number first. 		

Subtraction with regrouping	**Key Stage One**	10 — 6 = 4  42 - 16 = 26 Use the base 10 to make the first number. If you do not have enough ones, you need to regroup a ten stick for 10 ones. You can now take away the ones and then take away the tens.	  Draw the tens and ones of the first number. If you do not have enough ones, you need to cross out a ten stck and regroup for ten ones. Drawing the ten ones to the right of the ones you already have. You can then cross out the ones you are taking away and then cross out the tens you are taking away.	 Children can start their formal written method by partitioning the number into clear place value columns. Children can solve a variety of calculations, such as: 42 - 16 = 26 26 = 42 - 16 42 - □ = 26 □ - 16 = 26 42 - 26 = 16

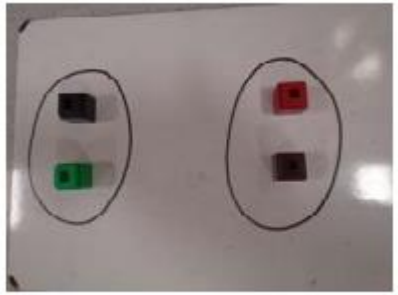
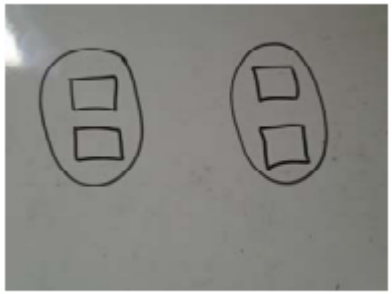
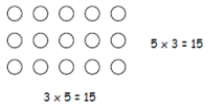
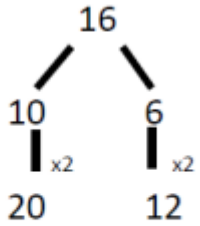
		   	   	

	Key Stage Two	Use Base 10 to start with before moving on to place value counters. Start with one regroup before moving onto subtractions where you have to regroup twice. Make the larger number with the place value counters Start with the ones, can I take away 8 from 4 easily? I need to exchange one of my tens for ten ones.  	  Draw the counters onto a place value grid and show what you have taken away by crossing the counters out as well as clearly showing the exchanges you make.	  Children can start their formal written method by partitioning the number into clear place value columns.  7169 - 372.5 =  Misconception: children can sometimes be confused by 0 - 5 and 5 - 0.

Multiplication

Year 1	Year 2	Year 3
• Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.	• Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers. • Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs • Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot. • Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.	• Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables • Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods • Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.
Year 4	**Year 5**	**Year 6**
• Recall multiplication and division facts for multiplication tables up to 12 × 12 • Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers • Recognise and use factor pairs and commutativity in mental calculations • Multiply two-digit and three-digit numbers by a one-digit number using formal written layout • Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects	• Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers • Multiply and divide numbers mentally drawing upon known facts • Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 • Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes • Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign	• Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication • Perform mental calculations, including with mixed operations and large numbers • Use their knowledge of the order of operations to carry out calculations involving the four operations

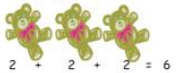
Objective	Year Group	Concrete	Pictorial	Abstract

Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.	**Early years**	Doubling Double 2 is 4 		Double 2 is 4 Double 4 is 8
	Key Stage One	Use practical activities to show how to double a number.  double 4 is 8 4 × 2 = 8 Understand multiplication as repeated addition, using objects, equipment and visual representations.  2 + 2 + 2 + 2 = 8 	Draw pictures to show how to double a number. Double 4 is 8  Use arrays to record and recognise multiplication. Record as: 5 x 3 = 3 + 3 + 3 + 3 = 15 3 x 5 = 5 + 5 + 5 = 15  5 × 3 = 15 3 × 5 = 15	 Partition a number and then double each part before recombining it back together. To know by heart the 2, 3, 5, & 10 times table facts Skip counting 

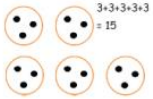
Count in multiples supported by concrete objects in equal groups.

Strategies for multiplication: concrete objects such as small toys, progressing to cubes, counters and Numicon pieces.

How many legs will 3 teddies have?

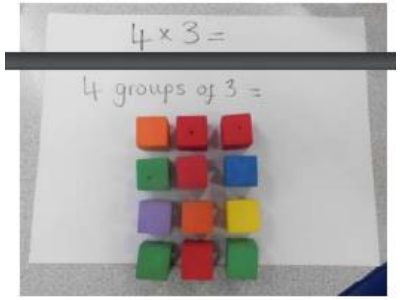


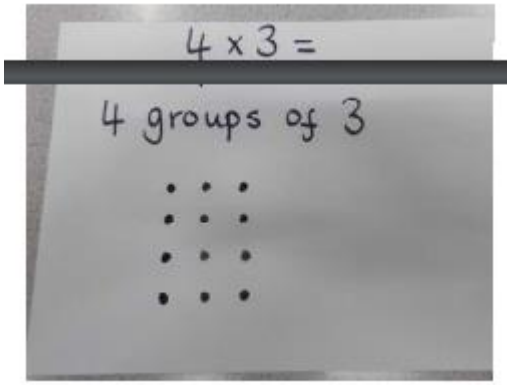
There are 3 sweets in one bag. How many sweets are in 5 bags altogether?



Progressing to pictorial representations (e.g. 3 x 5 = 15)

Continue to understand multiplication as repeated addition, lots of,
Understand **commutativity**.
Know that 3 x 6 = 18 ∴ 6 x 3 = 18.
Use practical equipment (cubes, Numicon, arrays) to demonstrate and explain this concept.





In Year 2, we would encourage the children to make links between multiplication and division. We would want children to see that if they know 3 x 4 = 12, then they also know 12 ÷ 4 = 3, etc.

3 x 4 = 12 12 ÷ 4 = 3

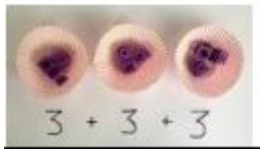
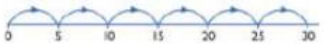
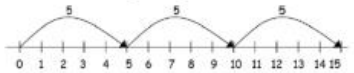
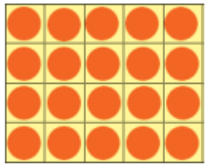
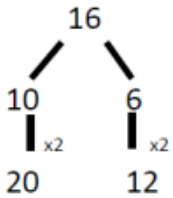
4 x 3 = 12 12 ÷ 3 = 4

Write sequences with multiples of numbers.

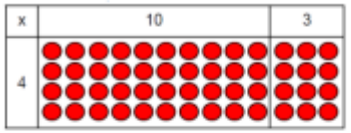
2, 4, 6, 8, 10

5, 10, 15, 20, 25 , 30

Write addition sentences to describe objects and pictures.

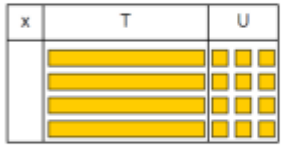
	Key Stage Two	Use practical activities to show how to double a number.  double 4 is 8 4 × 2 = 8   Use different objects to add equal groups.  3 + 3 + 3 Create arrays using counters/ cubes to show multiplication sentences.  	Draw pictures to show how to double a number. Double 4 is 8    Use a number line or pictures to continue support in counting in multiples. There are 3 plates. Each plate has 2 star biscuits on. How many biscuits are there?  2 add 2 add 2 equals 6  5 + 5 + 5 = 15 Draw arrays in different rotations to find **commutative** multiplication sentences.  4 × 2 = 8 2 × 4 = 8  2 × 4 = 8 4 × 2 = 8  Link arrays to area of rectangles.	 Partition a number and then double each part before recombining it back together. Count in multiples of a number aloud. Write sequences with multiples of numbers. 2, 4, 6, 8, 10 5, 10, 15, 20, 25 , 30 Write addition sentences to describe objects and pictures.  2 + 2 + 2 + 2 + 2 = 10 Use an array to write multiplication sentences and reinforce repeated addition.  5 + 5 + 5 = 15 3 + 3 + 3 + 3 + 3 = 15 5 x 3 = 15 3 x 5 = 15

Show the link with arrays to first introduce the grid method.



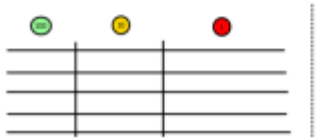
4 rows of 10
4 rows of 3

Move on to using Base 10 to move towards a more compact method.

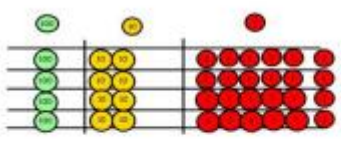


4 rows of 13

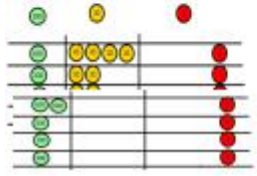
Move on to place value counters to show how we are finding groups of a number.We are multiplying by 4 so we need 4 rows.



Fill each row with 126.



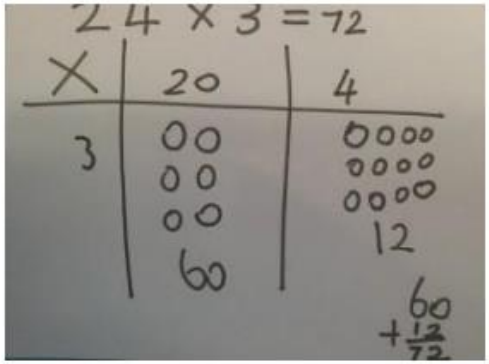
Add up each column, starting with the ones making any exchanges needed.



Then you have your answer.

Children can represent the work they have done with place value counters in a way that they understand.

They can draw the counters, using colours to show different amounts or just use circles in the different columns to show their thinking as shown below.



Start with multiplying by one digit numbers and showing the clear addition alongside the grid.

×	30	5
7	210	35

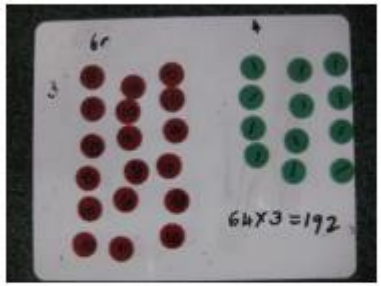
210 + 35 = 245

Moving forward, multiply by a 2 digit number showing the different rows within the grid method.

	10	8
10	100	80
3	30	24

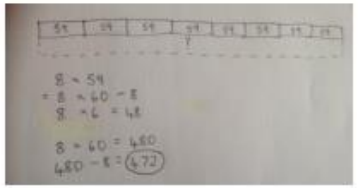
X	1000	300	40	2
10	10000	3000	400	20
8	8000	2400	320	16

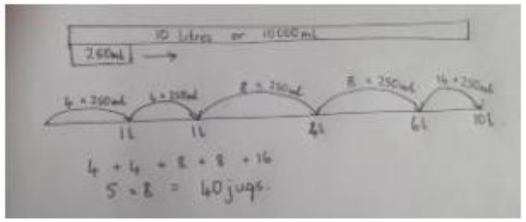
Children can continue to be supported by place value counters at the stage of multiplication.



It is important at this stage that they always multiply the ones first and note down their answer followed by the tens which they note below.

Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods.





Start with long multiplication, reminding the children about lining up their numbers clearly in columns.

If it helps, children can write out what they are solving next to their answer.

```
  32
x 24
   8   (4 x 2)
 120   (4 x 30)
  40   (20 x 2)
 600   (20 x 30)
 768
```

```
    74
  x 63
  ----
    12
   210
   240
+ 4200
  ----
  4662
```

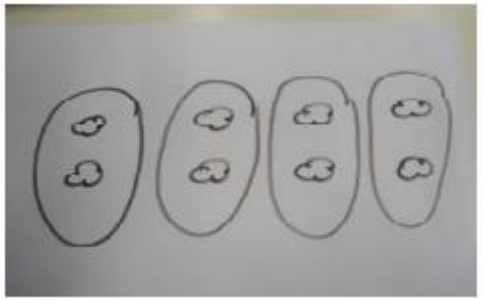
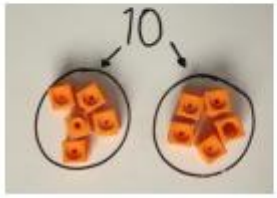
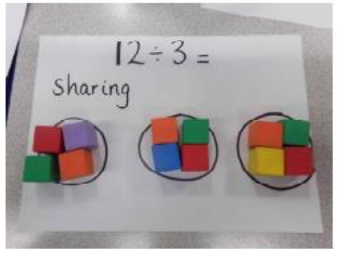
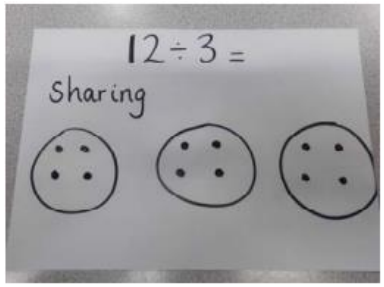
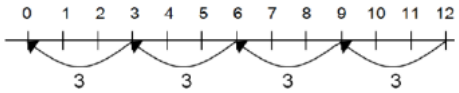
This moves to the more compact method.

```
   2 3 1
    1342
  x   18
 -------
  13420
  10736
 -------
  24156
 -------
     1
```

Division

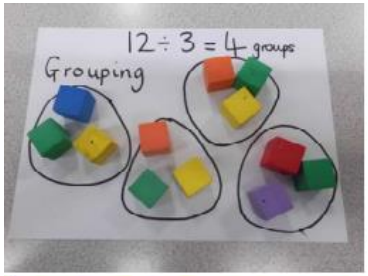
Year 1	Year 2	Year 3
• Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher	• Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers. • Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs • Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot. • Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	• Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables • Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods • Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.
Year 4	**Year 5**	**Year 6**
• Recall multiplication and division facts for multiplication tables up to 12 × 12 • Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers.	• Multiply and divide numbers mentally drawing upon known facts • Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context • Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 • Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes • Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign	• Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context • Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context • Perform mental calculations, including with mixed operations and large numbers • Use their knowledge of the order of operations to carry out calculations involving the four operations

Objective	Year Group	Concrete	Pictorial	Abstract
Explore and represent patterns within numbers up to 10, including	**Early years**	1 apple split into 2 equal parts	Can you share 8 buttons with 4 friends?	Jack has 8 sweets. He wants to share them with his friend. How many sweets will they get each?

evens and odds, double facts and how quantities can be distributed equally.		  8 carrots shared equally between 2 friends is 4 each.  		
	Key Stage One	 I have 10 cubes, can you share them equally in 2 groups?  	Children use pictures or shapes to share quantities.  8 ÷ 2 = 4  Use a number line to show jumps in groups. The number of jumps equals the number of groups. 	Share 9 buns between three people. 9 ÷ 3 = 3 28 ÷ 7 = 4 Divide 28 into 7 groups. How many are in each group? Find the inverse of multiplication and division sentences by creating four linking number sentences. 7 x 4 = 28 4 x 7 = 28 28 ÷ 7 = 4 28 ÷ 4 = 7

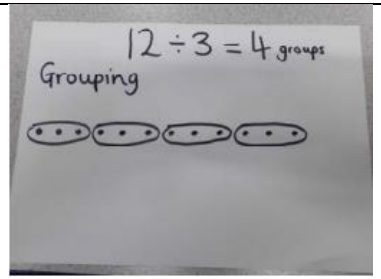
Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.

96 ÷ 3 = 32

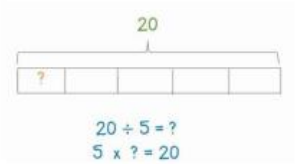


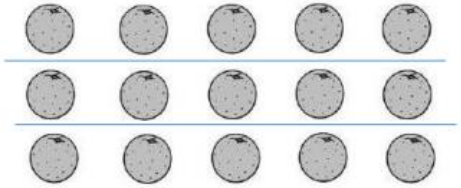
Link division to multiplication by creating an array and thinking about the number sentences that can be created.

Eg 15 ÷ 3 = 5 5 x 3 = 15
15 ÷ 5 = 3 3 x 5 = 15



Think of the bar as a whole. Split it into the number of groups you are dividing by and work out how many would be within each group.

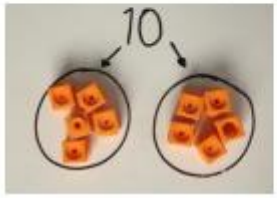




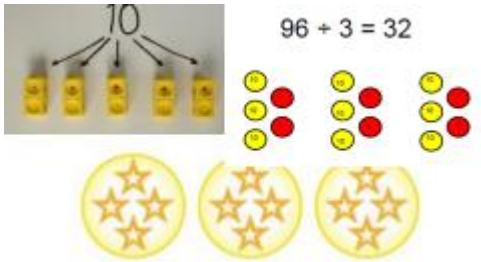
Draw an array and use lines to split the array into groups to make multiplication and division sentences.

Key Stage Two

I have 10 cubes, can you share them equally in 2 groups?



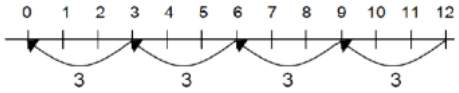
Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.



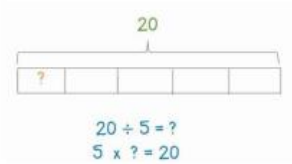
Children use pictures or shapes to share quantities.

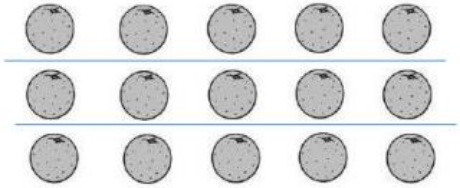
8 ÷ 2 = 4

Use a number line to show jumps in groups. The number of jumps equals the number of groups.



Think of the bar as a whole. Split it into the number of groups you are dividing by and work out how many would be within each group.





Draw an array and use lines to split the array into groups to make multiplication and division sentences.

Share 9 buns between three people.

9 ÷ 3 = 3

28 ÷ 7 = 4

Divide 28 into 7 groups. How many are in each group?

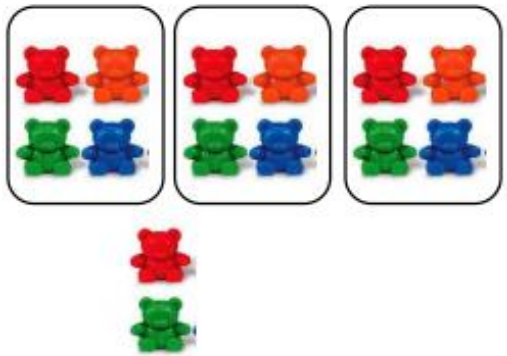
Find the inverse of multiplication and division sentences by creating four linking number sentences.

7 x 4 = 28
4 x 7 = 28
28 ÷ 7 = 4
28 ÷ 4 = 7

Link division to multiplication by creating an array and thinking about the number sentences that can be created.

Eg 15 ÷ 3 = 5 5 x 3 = 15
15 ÷ 5 = 3 3 x 5 = 15

14 ÷ 3 =
Divide objects between groups and see how much is left over

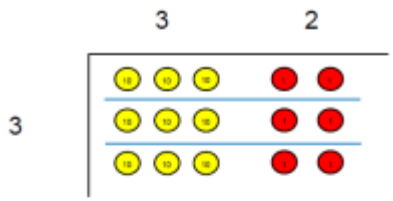
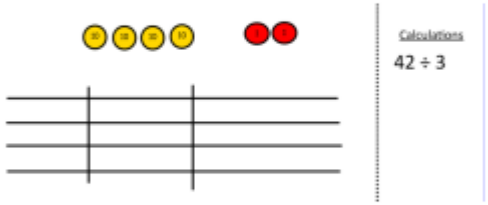
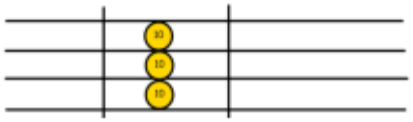
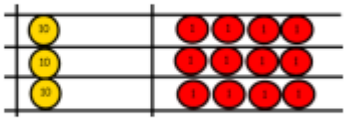
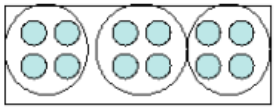


Jump forward in equal jumps on a number line then see how many more you need to jump to find a remainder.

Draw dots and group them to divide an amount and clearly show a remainder.

Complete written divisions and show the remainder using r.

29 ÷ 8 = 3 REMAINDER 5
dividend divisor quotient remainder

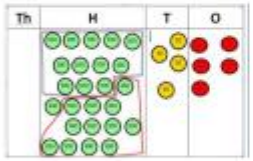
		Tens Units 3 2 3  Use place value counters to divide using the bus stop method alongside  Calculations 42 ÷ 3 42 ÷ 3= Start with the biggest place value, we are sharing 40 into three groups. We can put 1 ten in each group and we have 1 ten left over.   We exchange this ten for ten ones and then share the ones equally among the groups.  We look how much in 1 group so the answer is 14.	Students can continue to use drawn diagrams with dots or circles to help them divide numbers into equal groups.  Encourage them to move towards counting in multiples to divide more efficiently.	Begin with divisions that divide equally with no remainder. 2 1 8 3 4 8 7 2 Move onto divisions with a remainder. 8 6 r 2 3 5 4 3 2 Finally move into decimal places to divide the total accurately. 1 4 . 6 16 21 3 5 5 1 1 . 0

2544 ÷ 12
How many groups of 12 thousands do we have?
None

Exchange 2 thousand for 20 hundreds.

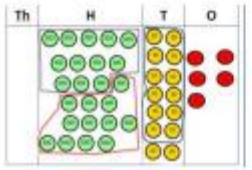
$$12\overline{)2544}\quad 0$$

How many groups of 12 are in 25 hundreds? 2 groups. Circle them.
We have grouped 24 hundreds so can take them off and we are left with one.



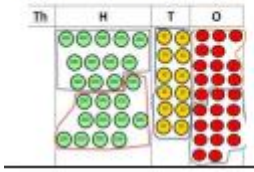
$$12\overline{)2544}\quad 02,\ 24,\ 1$$

Exchange the one hundred for ten tens so now we have 14 tens. How many groups of 12 are in 14? 1 remainder 2



$$12\overline{)2544}\quad 021,\ 24,\ 14,\ 12,\ 2$$

Exchange the two tens for twenty ones so now we have 24 ones. How many groups of 12 are in 24? 2



$$12\overline{)2544}\quad 0212,\ 24,\ 14,\ 12,\ 24,\ 24,\ 0$$

Instead of using physical counters, students can draw the counters and circle the groups on a whiteboard or in their books.

Use this method to explain what is happening and as soon as they have understood what move on to the abstract method as this can be a time consuming process.

$$\begin{array}{r} 0\,3\,1\,8\ r\,5 \\ 20\overline{)\,6\,3\,6\,5} \\ -\,6\,0\downarrow\ \ \downarrow \\ \quad 3\,6\ \ \downarrow \\ -\,2\,0\ \ \downarrow \\ \quad 1\,6\,5 \\ -\,1\,6\,0 \\ \quad\ \ 5 \end{array}$$