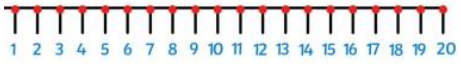
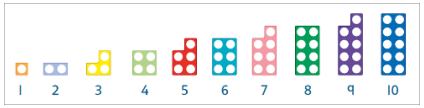
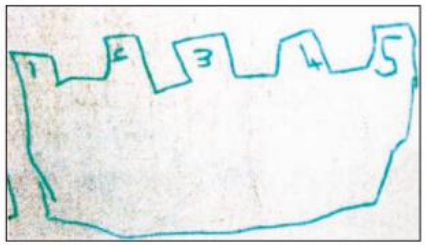
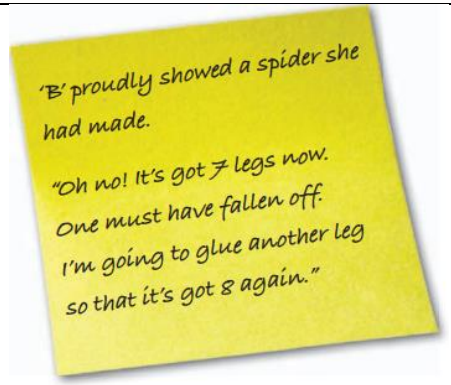
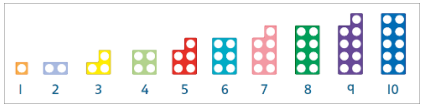
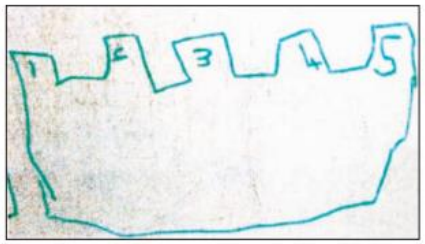
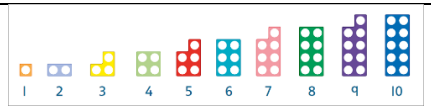
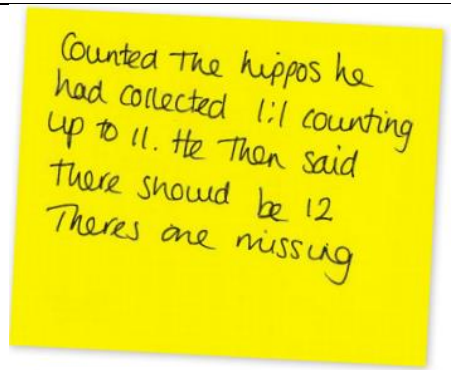
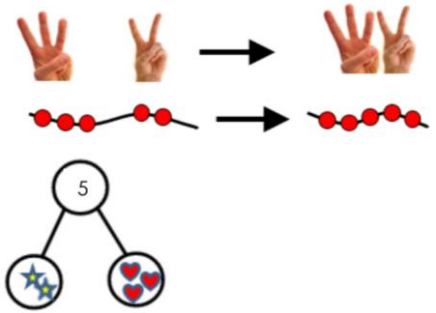
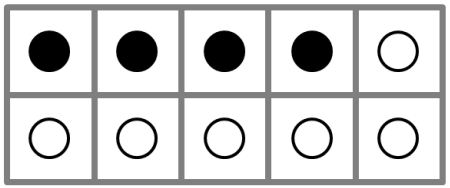
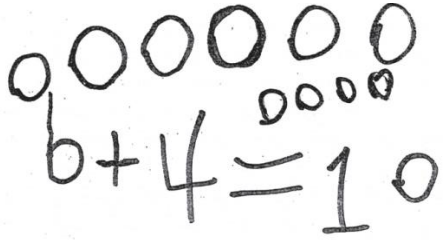
Calculation Policy

Throughout all calculations it is important that you talk about the inverse and that the answer can be written first.

Early Years Foundation Stage

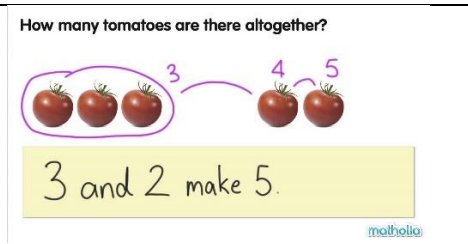
Objective	Concrete	Pictorial	Abstract	Vocabulary
To count reliably with numbers 1-20.	  Various counting equipment including: Numicon, counter, unifix, Number games, dominoes, base ten, dice.	 Using number lines, ordering numeral cards, 100 square, fives frame, tens frame, 'Number of the day' focus.	 'B' proudly showed a spider she had made. "Oh no! It's got 7 legs now. One must have fallen off. I'm going to glue another leg so that it's got 8 again." Counting aloud in 1's, 2's and 10's, singing number counting songs and rhymes.	Number: • zero • number • one, two, three … to twenty and beyond • teens numbers, eleven, twelve … twenty • none • how many …? • count, • count (up) to, • count on (from, to), • count back (from, to) • count in ones, twos, fives, tens • is the same as
To place numbers 1-20 in order.	  Various counting equipment including: Numicon, counter,	 Using number lines, ordering numeral cards, 100 square, fives frame, tens frame, 'Number of the day' focus.	Counting aloud in 1's, 2's and 10's, singing number counting songs and rhymes.	

Calculation Policy

	unifix, Number games, dominoes, base ten, dice.			• more, • less • odd, • even • few • pattern • pair Addition and Subtraction: • add, • more, • make, • sum, • total altogether • double • one more, two more … ten more • how many more to make …? • how many more is … than …?
To say which number is one more or one less than a given number.	 Various counting equipment including: Numicon, counter, unifix, Number games, dominoes, base ten, dice.	 Using number lines, ordering numeral cards, 100 square, fives frame, tens frame, subitising, 'Number of the day' focus.	 Counting aloud in 1's, 2's and 10's, singing number counting songs and rhymes.	
To add and subtract 2 single digit numbers.	 Various counting equipment including: Numicon, counter, unifix, Number games, dominoes, base ten, dice.	 Using number lines, 100 square, fives frame, tens frame, subitising, part-part whole method sheets.	 Counting aloud in 1's, 2's and 10's, singing number counting songs and rhymes.	

Calculation Policy

<table>
<tr>
<td>To count on and back to find the answer when adding and subtracting 2 single digit numbers.</td>
<td> 

Various counting equipment including: Numicon, counter, unifix, Number games, dominoes, base ten, dice.</td>
<td> 

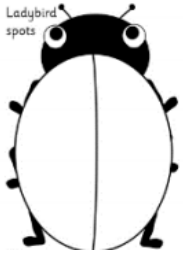
Using number lines, 100 square, fives frame, tens frame, subitising, part-part whole method sheets.</td>
<td> 

Counting aloud in 1's, 2's and 10's, singing number counting songs and rhymes.</td>
<td rowspan="2">

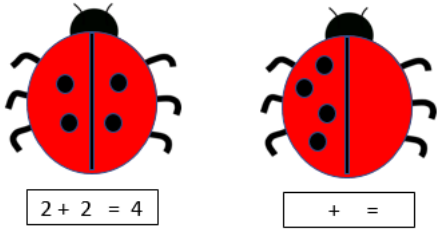
how much more is …?
take away
how many are left/left over?
how many have gone?
one less, two less, ten less …
how many fewer is … than …?
how much less is …?
difference between

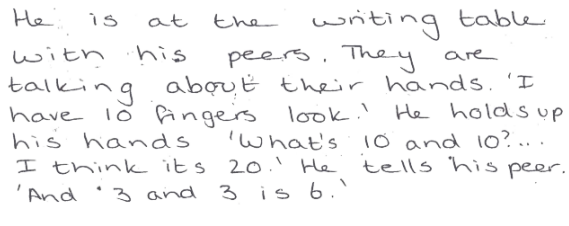
Multiplication and Division:

sharing
doubling
halving
number patterns

</td>
</tr>
<tr>
<td>To solve problems including doubling, halving and sharing.</td>
<td> 

Use counters or other practical equipment to calculate doubles and halves.

Various counting equipment including: Numicon, counter, unifix, Number games, dominoes, base ten, dice.</td>
<td> 

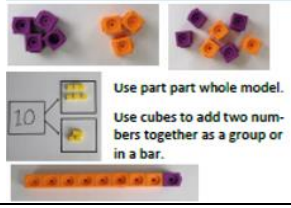
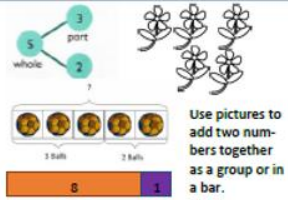
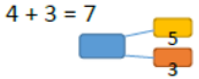
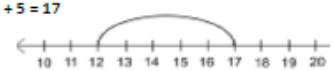
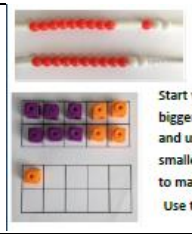
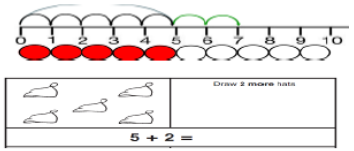
Children draw the other spots on to calculate doubles.
Using number lines, 100 square, fives frame, tens frame, subitising, part-part whole method sheets, ladybird outlines (for doubling, halving and sharing)</td>
<td> 

Counting aloud in 1's, 2's and 10's, singing number counting songs and rhymes.</td>
</tr>
</table>

Calculation Policy

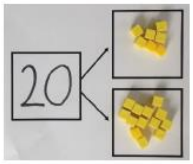
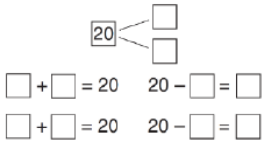
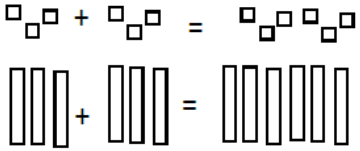
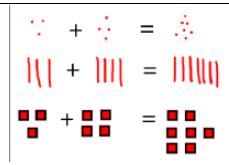
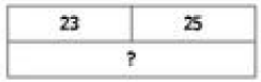
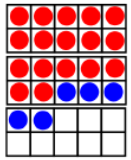
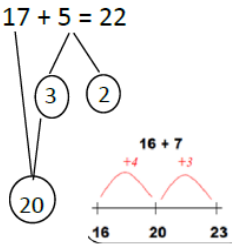
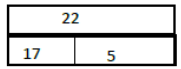
Addition

Year 1

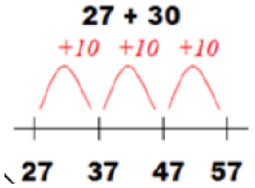
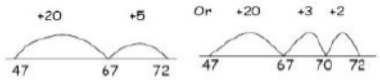
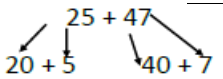
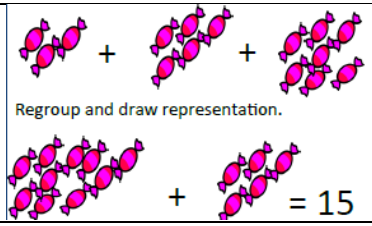
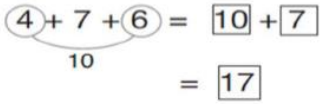
Objective	Concrete	Pictoral	Abstract	Vocabulary
Combining two parts to make a whole: part-whole model.	 Use part part whole model. Use cubes to add two numbers together as a group or in a bar.	 Use pictures to add two numbers together as a group or in a bar.	 10= 6 + 4 Use the part-part whole diagram as shown above to move into the abstract.	Add More Make Sum Total Altogether Equals Double Near double One more, two more, ten more How many more to make…? How many more is…than…? How much more is…? Number bonds
Starting at the bigger number and counting on.	 Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.	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.	5 + 12 = 17 Place the larger number in your head and count on the smaller number to find your answer.	
Regrouping to make 10 (needed for column addition later).	6 + 5 = 11  Start with the bigger number and use the smaller number to make 10. Use ten frames.	 3 + 9 = Use pictures or a number line. Regroup or partition the smaller number using the part part whole model to make 10. 9 + 5 = 14	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?	
Represent and use number bonds and related subtraction facts within 20.	 2 more than 5.	 5 + 2 =	Emphasis should be on the language *'1 more than 5 is equal to 6.'* *'2 more than 5 is 7.'* *'8 is 3 more than 5.'*	

Calculation Policy

Year 2

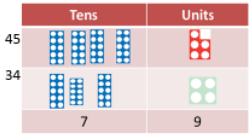
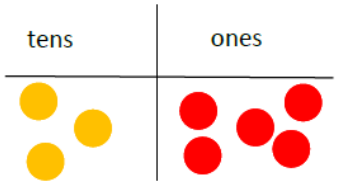
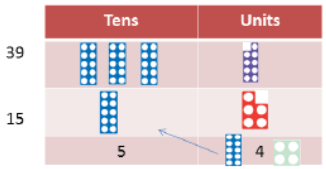
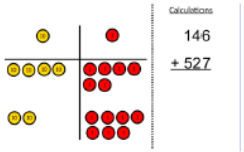
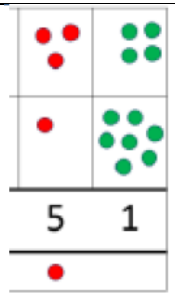
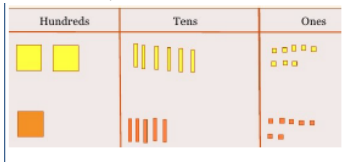
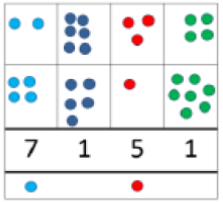
Objective	Concrete	Pictoral	Abstract	Vocabulary
Adding multiples of 10.	50= 30 = 20  Model using dienes and bead strings	 3 tens + 5 tens = ____ tens 30 + 50 = ____ Use representations for base ten.	20 + 30 = 50 70 = 50 + 20 40 + □ = 60	Add Addition More Make Sum Total Altogether Equals Double Near double One more, two more, ten more, hundred more How many more to make…? How many more is…than…? How much more is…? Number bonds Crossing a ten Is the same as Number pairs/bonds
Use known number facts: Part part whole.	 Children explore ways of making numbers within 20	 20 □ + □ = 20 20 − □ = □ □ + □ = 20 20 − □ = □	□ + 1 = 16 16 − 1 = □ 1 + □ = 16 16 − □ = 1	
Using known facts.		 Children draw representations of H,T and O	3 + 4 = 7 *leads to* 30 + 40 = 70 *leads to* 300 + 400 = 700	
Bar model	 3 + 4 = 7	 7 + 3 = 10	 23 25 ? 23 + 25 = 48	
Add a two digit number and ones.	 17 + 5 = 22 Use ten frame to make 'magic ten Children explore the pattern. 17 + 5 = 22 27 + 5 = 32	Use part part whole and number line to model.  17 + 5 = 22 3 2 20 16 + 7 +4 +3 16 20 23	17 + 5 = 22 Explore related facts 17 + 5 = 22 5 + 17 = 22 22—17 = 5 22—5 = 17  22 17 5	

Calculation Policy

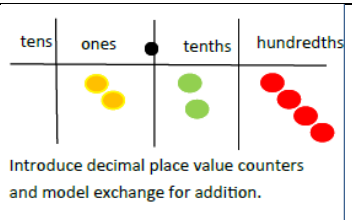
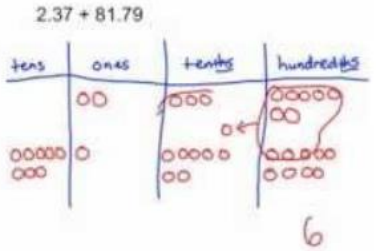
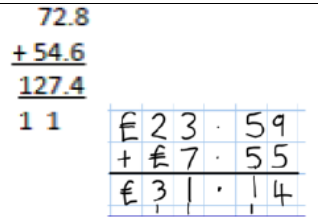
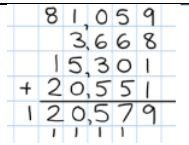
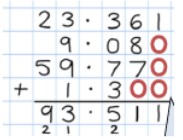
Add a 2 digit number and tens	 25 + 10 = 35 Explore that the ones digit does not change		27 + 10 = 37 27 + 20 = 47 27 + □ = 57	
Add two 2-digit numbers.	 Model using dienes , place value counters and numicon	 Use number line and bridge ten using part whole if necessary.	 20 + 40 = 60 5+ 7 =12 60 + 12 = 72	
Add three 1-digit numbers.	 Combine to make 10 first if possible, or bridge 1o then add third digit		 Combine the two numbers that make/ bridge ten then add on the third.	

Calculation Policy

Year 3-6

Objective	Concrete	Pictoral	Abstract	Vocabulary
Y3 Column addition – no regrouping	 Model using Dienes or nu-micon Add together the ones first, then the tens.   Move to using place value counters	Children move to drawing the counters using a tens and one frame. 	2 2 3 + 1 1 4 3 3 7 Add the ones first, then the tens, then the hundreds.	Add Addition Increase More Make Sum Total Altogether Equals Double Near double One more, two more, ten more, hundred more How many more to make…? How many more is…than…? How much more is…? Number bonds Crossing a ten 3-digit number Colum addition Inverse operation
Y3 Column addition with regrouping.	 Exchange ten ones for a ten. Model using numicon and pv counters. 	 Children can draw a rep-resentation of the grid to further support their understanding, carrying the ten **underneath** the line	20 + 5 40 + 8 60 + 13 = 73 Start by partitioning the numbers before formal column to show the exchange. 536 + 85 621 1 1	
Y4 Add numbers with upto 4 digits	Children continue to use dienes or pv counters to add, exchanging ten ones for a ten and ten tens for a hundred and ten hundreds for a thousand. 	 Draw representations using pv grid.	3517 + 396 3913 Continue from previous work to carry hundreds as well as tens. Relate to money and measures.	

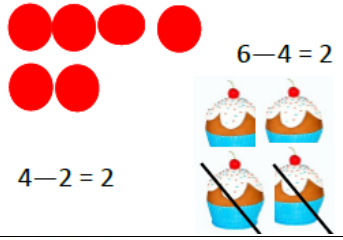
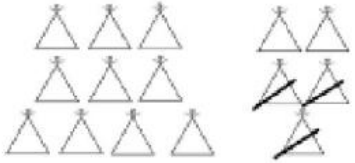
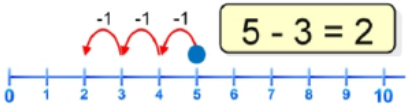
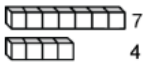
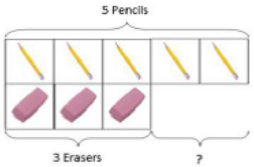
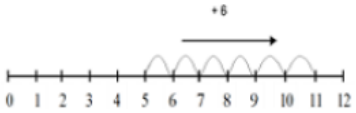
Calculation Policy

Y5/6 Add decimals with 2 decimal places, including money.	 Introduce decimal place value counters and model exchange for addition.			Year 5/6: Tenths boundary Decimal number
Y5/6 Add several numbers of increasing complexity	Same as Y4/5	Same as Y4/5	 Insert zeros for place holders. 	

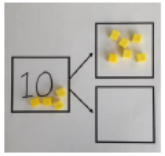
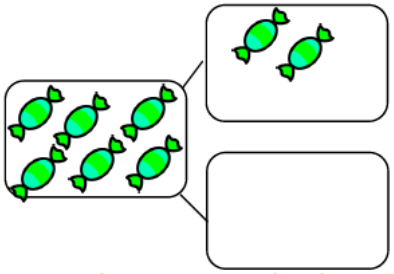
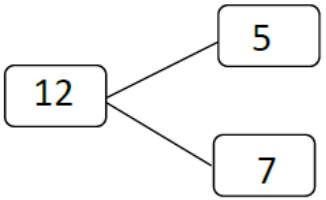
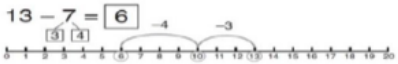
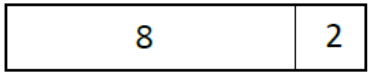
Calculation Policy

Subtraction

Year 1

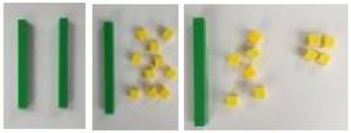
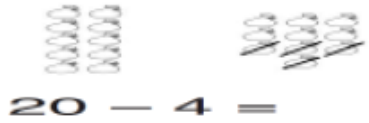
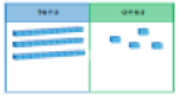
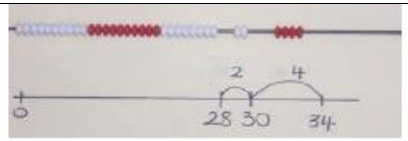
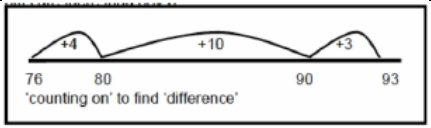
Objective	Concrete	Pictorial	Abstract	Vocabulary
Taking away ones.	Use physical objects, counters , cubes etc to show how objects can be taken away. 	 15 – 3 = 12 Cross out drawn objects to show what has been taken away.	7—4 = 3 16—9 = 7	Subtract Take away How many are left/ how many are gone? One less, two less, ten less… How many fewer is…than…? How much less is…? Difference between Half, halve Number bonds
Counting back.	 Move objects away from the group, counting backwards.  Move the beads along the bead string as you count backwards.	 Count back in ones using a number line.	Put 13 in your head, count back 4. What number are you at?	
Find the difference	Compare objects and amounts  'Seven is 3 more than four' 'I am 2 years older than my sister'  Lay objects to represent bar model.	Count on using a number line to find the difference. 	Hannah has12 sweets and her sister has 5. How many more does Hannah have than her sister.?	

Calculation Policy

Represent and use number bonds and related subtraction facts within 20.	 Link to addition. Use PPW model to model the inverse. If 10 is the whole and 6 is one of the arts, what s the other part? 10—6 = 4	 Use pictorial representations to show the part.	Move to using numbers within the part whole model. 	
Make 10	14—9  Make 14 on the ten frame. Take 4 away to make ten, then take one more away so that you have taken 5.	13—7  Jump back 3 first, then another 4. Use ten as the stopping point.	16—8 How many do we take off first to get to 10? How many left to take off?	
Bar model	 5—2 = 3		 10 = 8 + 2 10 = 2 + 8 10—2 = 8 10—8 = 2	

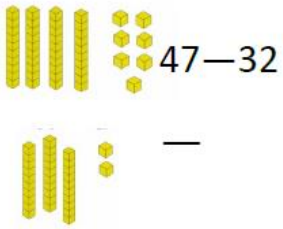
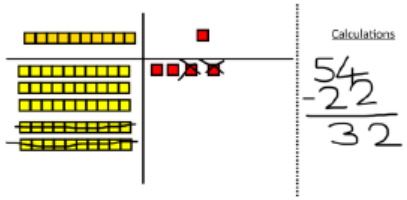
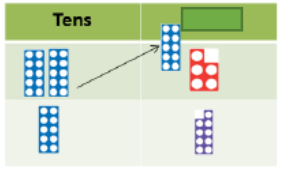
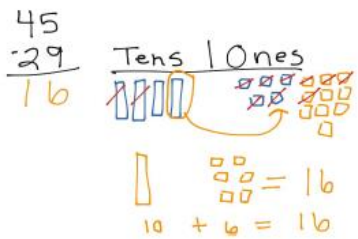
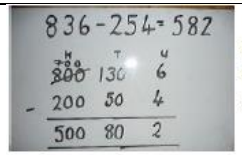
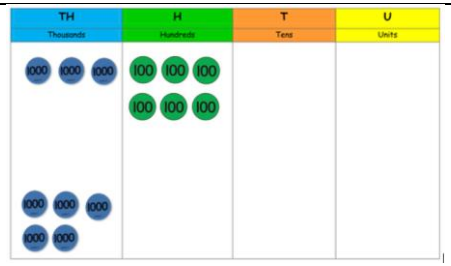
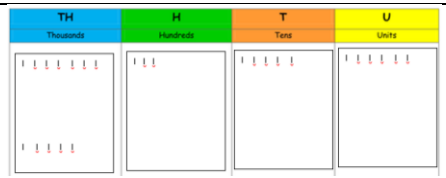
Calculation Policy

Year 2

Objective	Concrete	Pictorial	Abstract	Vocabulary
Regroup a ten into ten ones.	 Use a PV chart to show how to change a ten into ten ones, use the term 'take and make'		20—4 = 16	Subtract Subtraction Take away How many are left/left over? One less, two less…ten less…one hundred less How many fewer is…than…? Difference between Equals Is the same as Number bonds/pairs Tens boundaries
Partitioning to subtract without regrouping (friendly numbers).	34—13 = 21  Use Dienes to show how to partition the number when subtracting without regrouping.  	Children draw representations of Dienes and cross off.  43—21 = 22	43—21 = 22	
Make ten strategy (progression should be crossing one ten, crossing more than one ten, crossing the hundreds).	 34—28 Use a bead bar or bead strings to model counting to next ten and the rest.	 Use a number line to count on to next ten and then the rest.	93—76 = 17	

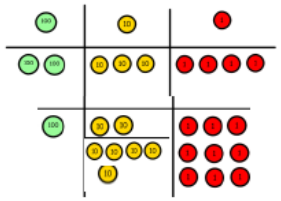
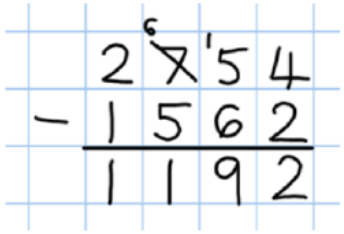
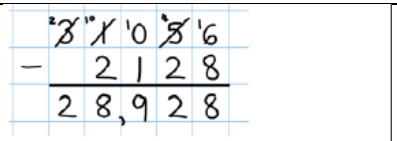
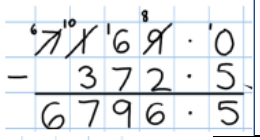
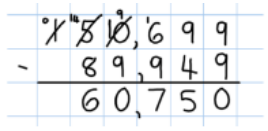
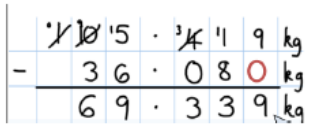
Calculation Policy

Year 3

Objective	Concrete	Pictorial	Abstract	Vocabulary
Column subtraction without regrouping (friendly numbers).	 Use base 10 or Numicon to model	 Darw representations to support understanding	47−24=23 40+7 −20+4 20+3 Intermediate step may be needed to lead to clear subtraction understanding. 	Subtract Subtraction Take away How many left/left over? One less, two less…ten less…one hundred less How many fewer is…than…? How much less is…? Difference between Equals Is the same as Tens boundary, hundreds boundary Three-digit number Hundred, tens and ones Columnar subtraction Inverse operation
Column subtraction with regrouping.	 Begin with base 10 or Numicon. Move to pv counters, modelling the exchange of a ten into tten ones. Use the phrase 'take and make' for exchange.	 Children may draw base ten or PV counters and cross off.	 Begin by partitioning into pv columns  Then move to formal method.	
Add and subtract multiples of 100 and 1000.	 3600 + 5000 =	 7356 + 5000 =	6358 + 3000 = 9358	

Calculation Policy

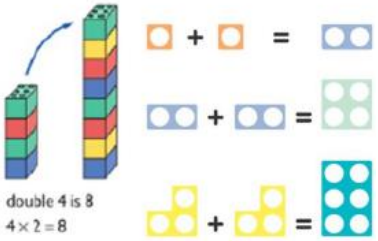
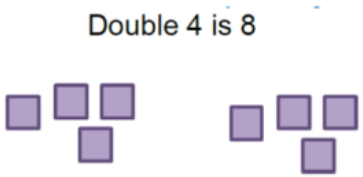
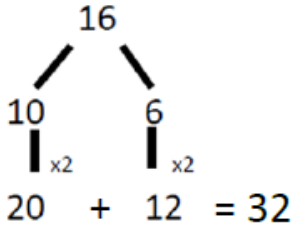
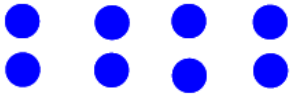
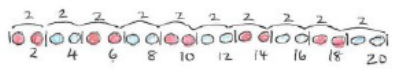
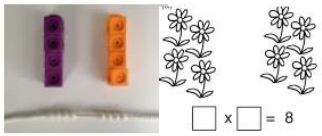
Year 4-6

Objective	Concrete	Pictorial	Abstract	Vocabulary
Subtracting tens and ones (Year 4 upto 4 digits).	234 - 179  Model process of exchange using Numicon, base ten and then move to PV counters.	Draw place value counters – see Year 3.	 Use the phrase 'take and make' for exchange	Subtract Subtraction Take away Decrease How many left/left over? One less, two less…ten less…one hundred less How many fewer is…than…? How much less is…? Difference between Equals Is the same as Tens boundary, hundreds boundary, tenths boundary, ones boundary Four-digit numbers and over Decimal number Columnar subtraction Inverse operation
Year 5 – subtract with at least 4 digits, including money and measures (include subtracting decimals with mixture of digits).	Same as Year 4	Draw place value counters – see Year 3.	 Use zeros for place-holders. 	
Year 6 – subtract with increasingly large and more complex numbers and decimal values.			 	

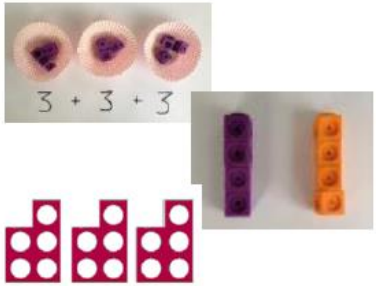
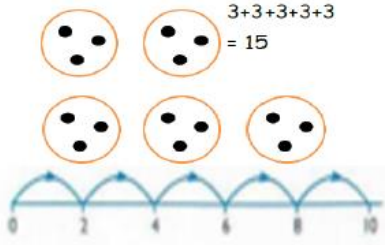
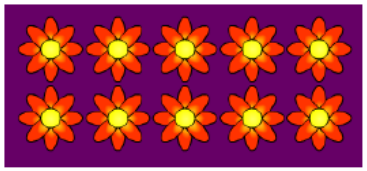
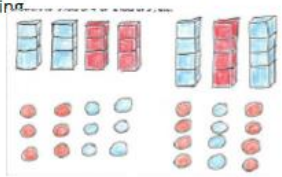
Calculation Policy

Multiplication

Year 1

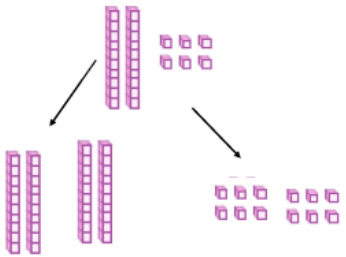
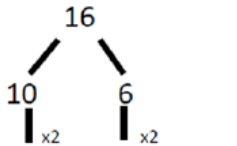
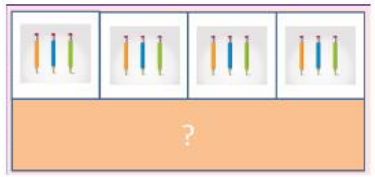
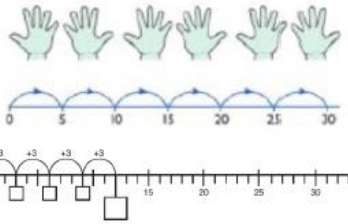
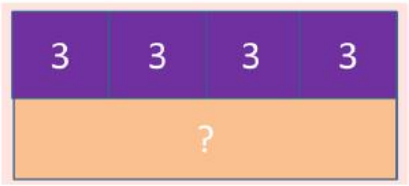
Objective	Concrete	Pictorial	Abstract	Vocabulary
Doubling	Use practical activities using manipulatives including cubes and Numicon to demonstrate doubling  	Draw pictures to show how to double numbers  	Partition a number and then double each part before recombining it back together.  	Double Array Equals Is the same as Groups Multiplication Multiple Number patterns
Counting in multiples	Count the groups as children are skip counting, children may use their fingers as they are skip counting.  	 Children make representations to show counting in multiples. 	Count in multiples of a number aloud. Write sequences with multiples of numbers. 2, 4, 6, 8, 10 5, 10, 15, 20, 25 , 30	
Making equal groups and counting the total.	 Use manipulatives to create equal groups.	Draw  to show 2 x 3 = 6 Draw and make representations	2 x 4 = 8 2 x 6 = 12	

Calculation Policy

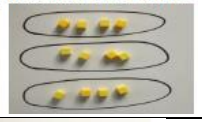
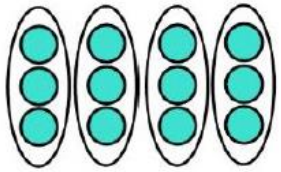
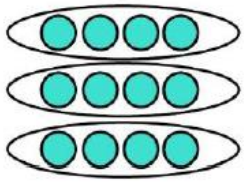
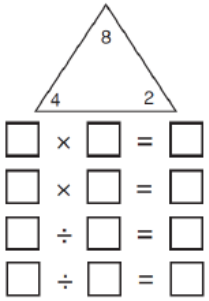
Repeated addition	 Use different objects to add equal groups	Use pictorial including number lines to solve prob There are 3 sweets in one bag. How many sweets are in 5 bags altogether? 	Write addition sentences to describe objects and pictures. 	
Understanding arrays	Use objects laid out in arrays to find the answers to 2 lots 5, 3 lots of 2 etc. 	Draw representations of arrays to show understanding 	3 x 6 = 18 2 x 10 = 20 3 x 5 = 15	

Calculation Policy

Year 2

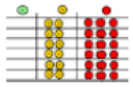
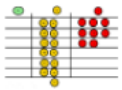
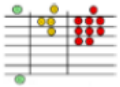
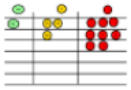
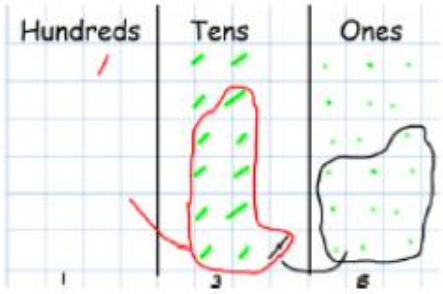
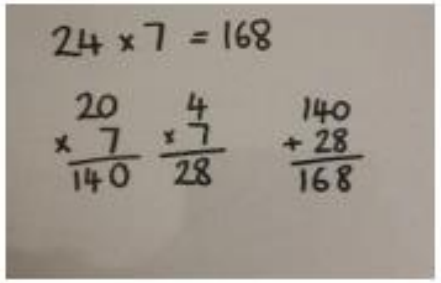
Objective	Concrete	Pictorial	Abstract	Vocabulary
Doubling	Model doubling using dienes and PV counters.  40 + 12 = 52	Draw pictures and representations to show doubling a number.	Partition a number and then double each part before recombining it back together.  16 10 x2 6 x2 20 + 12 = 32	Lots of Groups of Multiplication facts Times Multiply Multiplied by Multiple of …times as big Repeated addition Arrays Row Column Double
Counting in multiples of 2, 3, 5 and 10 from 0 (repeated addition).	Count the groups as children are skip counting, children may use their fingers as they are skip counting. Use bar models.  5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 = 40   ?	Number lines, counting sticks and bar models should be used to show representation of counting in multiples.   3 3 3 3 ?	Count in multiples of a number aloud. Write sequences with multiples of numbers. 0, 2, 4, 6, 8, 10 0, 3, 6, 9, 12, 15 0, 5, 10, 15, 20, 25 , 30 4 × 3 = □	

Calculation Policy

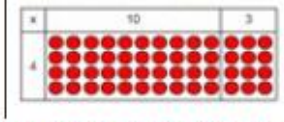
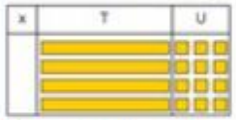
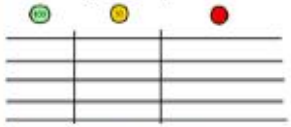
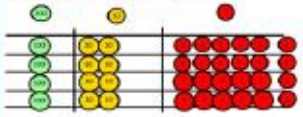
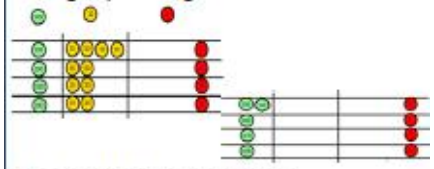
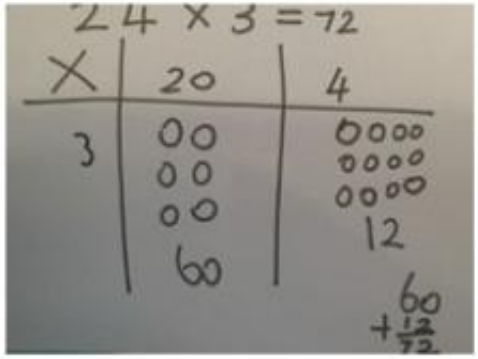
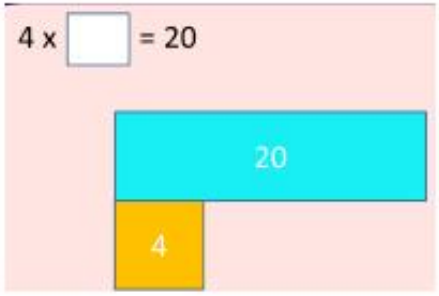
Multiplication is commutative	Create arrays using counters and cubes and Numicon.    Pupils should understand that an array can represent different equations and that, as multiplication is commutative, the order of the multiplication does not affect the answer.  	Use representations of arrays to show different calculations and explore commutativity.  	12 = 3 × 4 12 = 4 × 3 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	
Using the inverse (this should be taught alongside division, so pupils learn how they work alongside each other).			2 x 4 = 8 4 x 2 = 8 8 ÷ 2 = 4 8 ÷ 4 = 2 8 = 2 x 4 8 = 4 x 2 2 = 8 ÷ 4 4 = 8÷ 2 Show all 8 related fact family sentences.	

Calculation Policy

Year 3

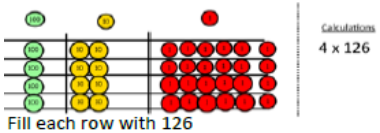
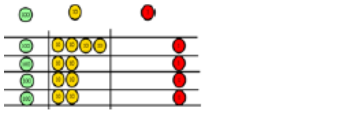
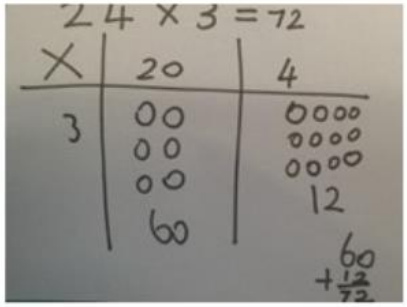
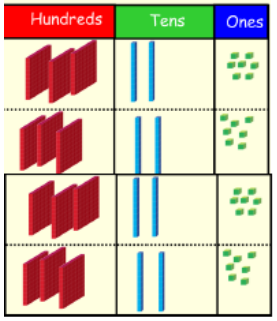
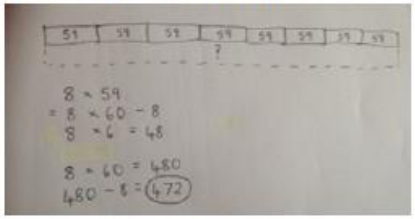
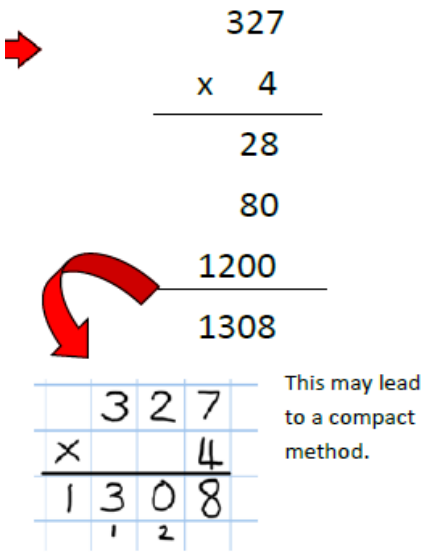
Objective	Concrete	Pictorial	Abstract	Vocabulary
Using the distributive law	6 x 23  **Step 1**: get 6 lots of 23  **Step 2**: 6 x 3 is 18. Can I make an exchange? Yes! Ten ones for one ten....  **Step 3**: 6 x 2 tens and my extra ten is 13 tens. Can I make an exchange? Yes! Ten tens for one hundred...  **Step 4**- what do I have I each column?			Lots of Groups of Times by Multiply Multiplication Multiplied by Product Factor Repeated addition Array Row Column

Calculation Policy

Grid method 2 digit x 1 digit.	Show the links with arrays to first introduce the grid method  4 rows of 10 4 rows of 3 Move onto base ten 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  Calculations 4 x 126 Fill each row with 126  Calculations 4 x 126 Add up each column, starting with the ones making any exchanges needed  Then you have your answer.	Children can represent their work with place value counters in a way that they understand. They can draw the counters using colours to show different amounts or just use the circles in the different columns to show their thinking as shown below.  Bar model are used to explore missing numbers  	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	Double …times as big

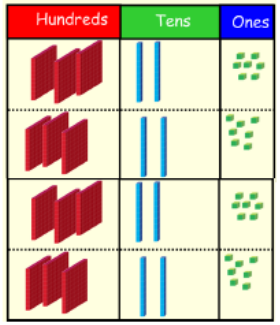
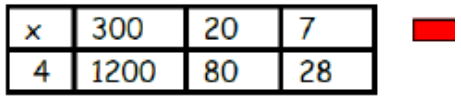
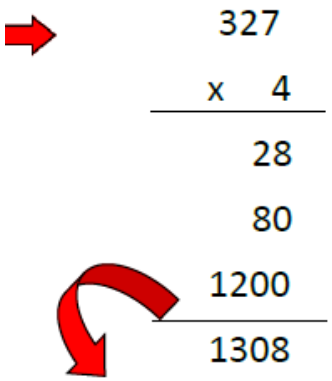
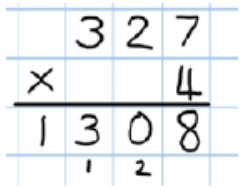
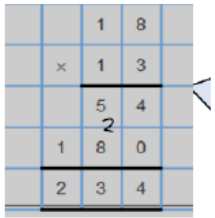
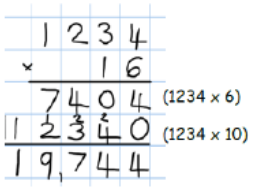
Calculation Policy

Year 4

Objective	Concrete	Pictorial	Abstract	Vocabulary
Grid method recap – move onto 3 digit multiplied by 1 digit.	Use place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows  Calculations 4 x 126 Fill each row with 126   Add up each colu…nes making any exchanges needed	Children can represent their work with place value counters in a way that they understand. They can draw the counters using colours to show different amounts or just use the 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. **210 + 35 = 245**	Lots of Groups of Times by Multiply Multiplication Multiplied by Product Factor Repeated addition Array Row Column Double …times as big Cube numbers Square numbers Inverse operations
Column multiplication	Children can continue to be supported by place value counters at the stage of multiplication. This initially done where there is no regrouping. 321 x 2 = 642  It is important at this stage that they always multiply the ones first. The corresponding long multiplication is modelled alongside	 The grid method my be used to show how this relates to a formal written method.  Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods.	 This may lead to a compact method.	

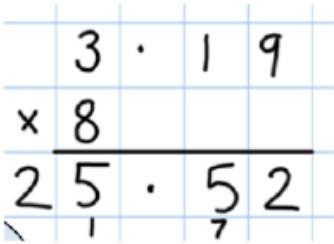
Calculation Policy

Year 5/6

Objective	Concrete	Pictorial	Abstract	Vocabulary
Column multiplication for 3 and 4 digits x 1 digit.	 It is important at this stage that they always multiply the ones first. Children can continue to be supported by place value counters at the stage of multiplication. This initially done where there is no regrouping. 321 x 2 = 642		  This will lead to a compact method.	Lots of Groups of Times by Multiply Multiplication Multiplied by Product Factor Repeated addition Array Row Column Double …times as big Cube numbers Square numbers Inverse operations
Column multiplication	Manipulatives may still be used along with corresponding multiplication method.	 Continue to use bar modelling to support problem solving	 18 x 3 on the first row (8 x 3 =24, carrying the 2 for 20, then 1 x 3) 18 x 10 on the 2nd row. Show multiplying by 10 by putting zero in units first  (1234 x 6) (1234 x 10)	

Calculation Policy

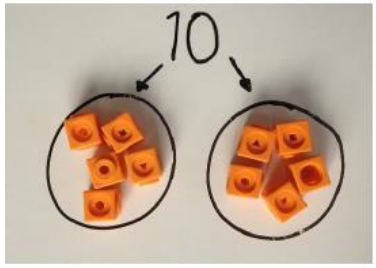
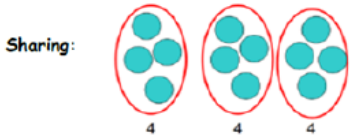
Year 6

Objective	Concrete	Pictorial	Abstract	Vocabulary
Multiplying decimals up to 2 decimal places by a single digit.			Remind children that the single digit belongs in the units column. Line up the decimal points in the question and the answer.  	

Calculation Policy

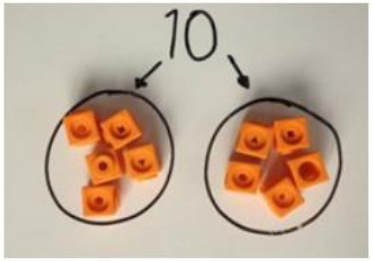
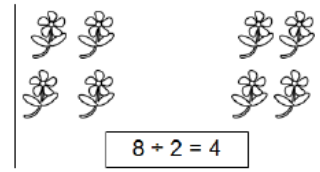
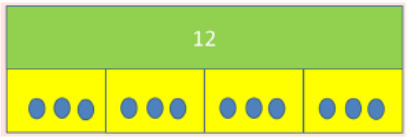
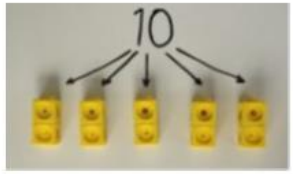
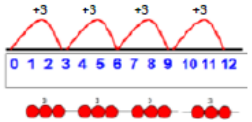
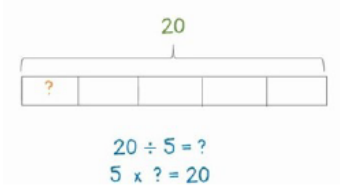
Division

Year One

Objective	Concrete	Pictorial	Abstract	Vocabulary
Division is sharing	   I have 10 cubes. Can you share them equally in 2 groups?	Children use pictures or shapes to share quantities.  8 shared between 2 is 4  12 shared between 3 is 4	12 shared between 3 is 4	left left over grouping sharing share array

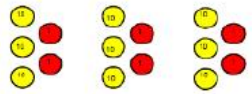
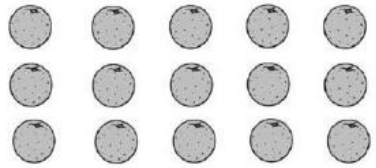
Calculation Policy

Year Two

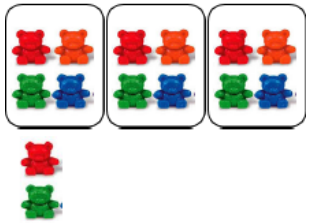
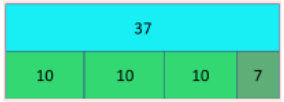
Objective	Concrete	Pictorial	Abstract	Vocabulary
Division is sharing	 I have 10 cubes. Can you share them equally in 2 groups?	Children use pictures or shapes to share quantities.  Children use bar modelling to show and support understanding.  12 ÷ 4 = 3	12 ÷ 3 = 4	division dividing divide divided by divided into left left over grouping sharing share share equally one each, two each, three each … ten each group in pairs, threes … tens equal groups of halving array row column number patterns
Division as grouping	Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.  	Use number lines for grouping  12 ÷ 3 = 4 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. 	28 ÷ 7 = 4 Divide 28 into 7 groups. How many are in each group?	

Calculation Policy

Year Three

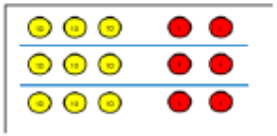
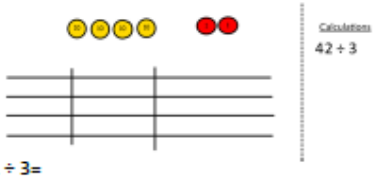
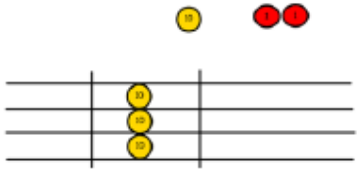
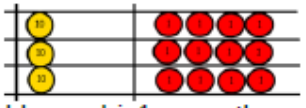
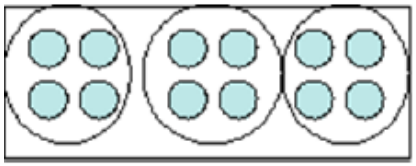
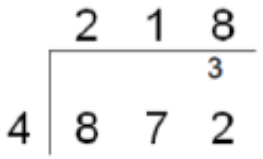
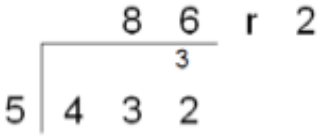
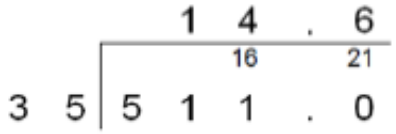
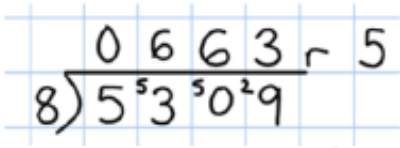
Objective	Concrete	Pictorial	Abstract	Vocabulary
Division as grouping	Use cubes, counters, objects or place value counters to aid understanding.  24 divided into groups of 6 = 4 96 ÷ 3 = 32 	Continue to use bar modelling to aid solving division problems.  20 ÷ 5 = ? 5 x ? = 20	How many groups of 6 in 24? 24 ÷ 6 = 4	division dividing divide divided by divided into left left over remainder grouping sharing share share equally one each, two each, three each … ten each group in pairs, threes … tens equal groups of halving array row column number patterns division fact inverse
Division with arrays	 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	Draw an array and use lines to split the array into groups to make multiplication and division sentences 	Find the inverse of multiplication and division sentences by creating eight linking number sentences. 7 x 4 = 28 4 x 7 = 28 28 ÷ 7 = 4 28 ÷ 4 = 7 28 = 7 x 4 28 = 4 x 7 4 = 28 ÷ 7 7 = 28 ÷ 4	

Calculation Policy

Division with remainders.	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.  Use bar models to show division with remainders.  	**Complete written divisions and show the remainder using r.**  		

Calculation Policy

Year Four – Six

Objective	Concrete	Pictorial	Abstract	Vocabulary
Divide at least 3 digit numbers by 1 digit numbers. Short division	96 ÷ 3 Tens Units 3 2 3  Use place value counters to divide using the bus stop method alongside  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.  Move onto divisions with a remainder.  Finally move into decimal places to divide the total accurately.   For 2 digit numbers children to write down the multiplication facts first.	division dividing divide divided by divided into left left over remainder grouping sharing share share equally one each, two each, three each … ten each group in pairs, threes … tens equal groups of halving array row column number patterns division fact inverse square squared cube cubed

Calculation Policy

Long Division

1. Divide.	2. Multiply & subtract.	3. Drop down the next digit.
h t o 1 2)2 7 8 Two goes into 2 one time, or 2 hundreds ÷ 2 = 1 hundred.	h t o 1 2)2 7 8 -2 0 Multiply 1 × 2 = 2, write that 2 under the two, and subtract to find the remainder of zero.	h t o 1 8 2)2 7 8 -2 ↓ 0 7 Next, drop down the 7 of the tens next to the zero.
Divide.	**Multiply & subtract.**	**Drop down the next digit.**
h t o 1 3 2)2 7 8 -2 0 7 Divide 2 into 7. Place 3 into the quotient.	h t o 1 3 2)2 7 8 -2 0 7 - 6 1 Multiply 3 × 2 = 6, write that 6 under the 7, and subtract to find the remainder of 1 ten.	h t o 1 3 2)2 7 8 -2 0 7 - 6 1 8 Next, drop down the 8 of the ones next to the 1 leftover ten.
1. Divide.	**2. Multiply & subtract.**	**3. Drop down the next digit.**
h t o 1 3 9 2)2 7 8 -2 0 7 - 6 1 8 Divide 2 into 18. Place 9 into the quotient.	h t o 1 3 9 2)2 7 8 -2 0 7 - 6 1 8 -1 8 0 Multiply 9 × 2 = 18, write that 18 under the 18, and subtract to find the remainder of zero.	h t o 1 3 9 2)2 7 8 -2 0 7 - 6 1 8 -1 8 0 There are no more digits to drop down. The quotient is 139.

Calculation Policy