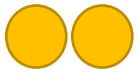
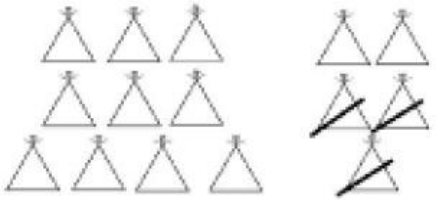
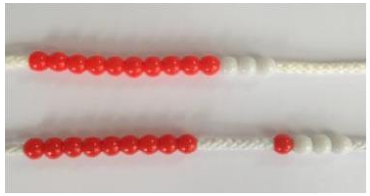
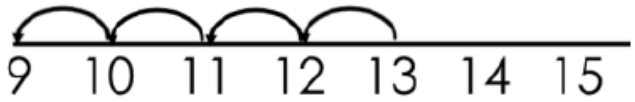
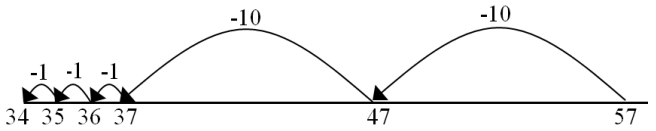
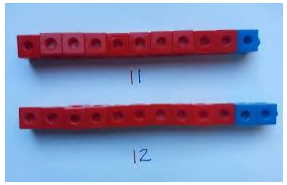
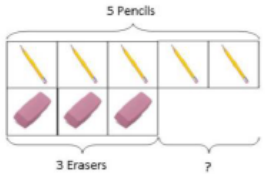
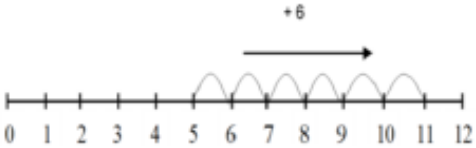
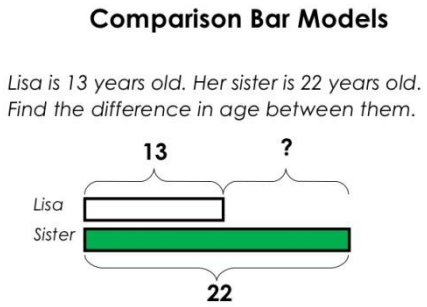
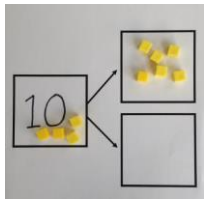
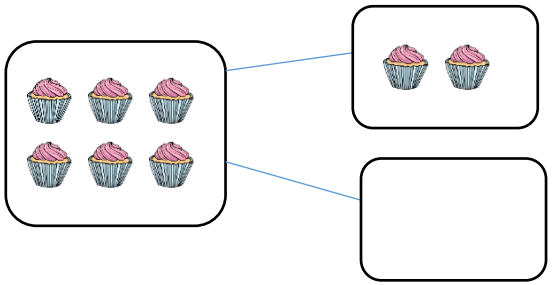
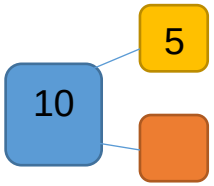
Progression in subtraction calculation

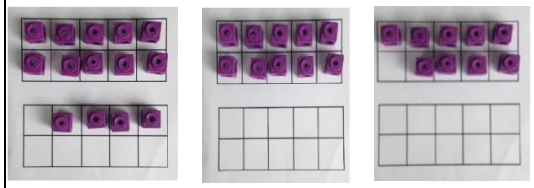
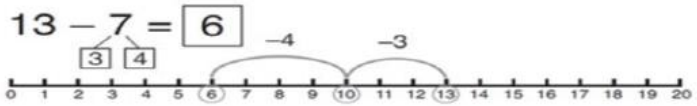
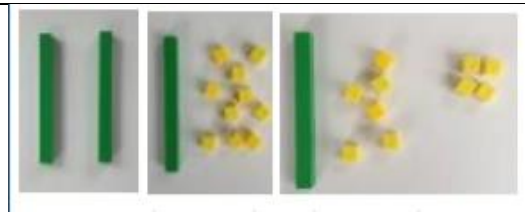
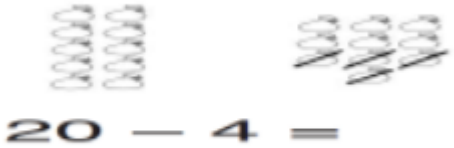
Primary Progression – Addition & Subtraction

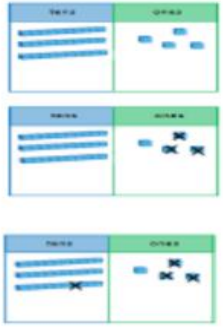
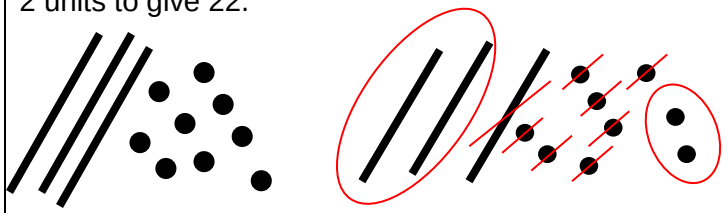
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Addition & Subtraction: Calculations	• add and subtract one-digit and two-digit numbers to 20, including zero **Autumn 2** **Spring 1**	• add and subtract numbers using concrete objects, pictorial representations, and mentally, including: ➢ a two-digit number and ones ➢ a two-digit number and tens ➢ two two-digit numbers ➢ adding three one-digit numbers **Autumn 2**	• 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 **Autumn 2**	• add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate **Autumn 2**	• 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 **Autumn 2**	• 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 **Autumn 2**

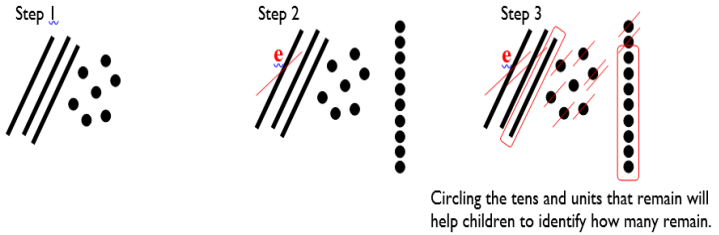
Key subtraction vocabulary: take away, less than, the difference, subtract, minus, fewer, decrease, column subtraction, exchange, estimate, inverse operation, solve problems ,number facts, place value.			
National Curriculum Programme of Study Statements Pupils should be taught to: represent and use number bonds and related subtraction facts within 20 add and subtract 1-digit and 2-digit numbers to 20, including 0			
Objective and Strategies	Concrete	Pictorial	Abstract
REC and Y1 **How to teach:** Taking away ones	Use physical objects, counters, cubes etc to show how objects can be taken away.  6 – 2 = 4   	Cross out drawn objects to show what has been taken away.  15 – 3 = 12	18 -3= 15 8 – 2 = 6
REC and Y1 **How to teach:** Counting back	Make the larger number in your subtraction. Move the beads along your bead string as you count backwards in ones.  13 – 4	Count back on a number line or number track  Start at the bigger number and count back the smaller number showing the jumps on the number line.	Put 13 in your head, count back 4. What number are you at? Use your fingers to help.

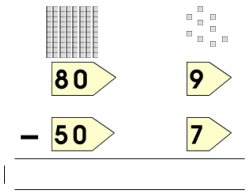
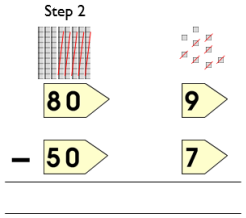
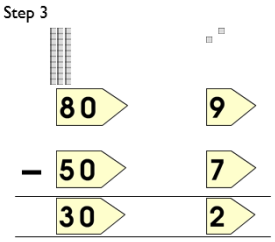
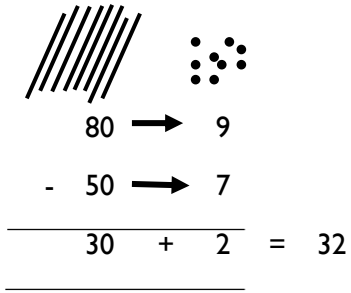
	Use counters and move them away from the group as you take them away  counting backwards as you go.	 This can progress all the way to counting back using two 2 digit numbers.	

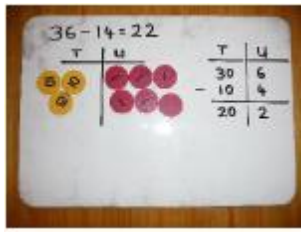
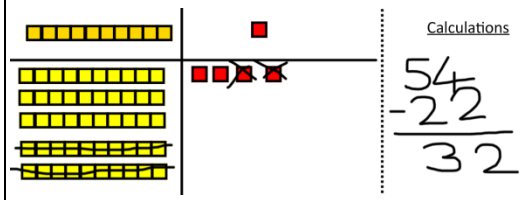
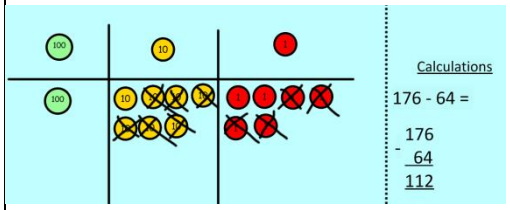
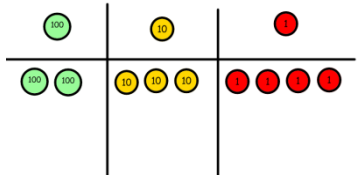
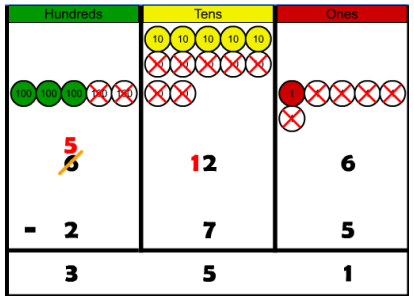
Objectives and strategies	Concrete	Pictorial	Abstract
Y1 and Y2 **How to teach:** Find the difference	Compare amounts and objects to find the difference.  Use cubes to build towers or make bars to find the difference  Use basic bar models with items to find the difference	 Count on to find the difference. Draw bars to find the difference between 2 numbers.  	Hannah has 23 sandwiches, Helen has 15 sandwiches. Find the difference between the number of sandwiches.
Rec and Y1 **How to teach subtraction using:** Part Whole Model	 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 =	Use a pictorial representation of objects to show the part whole model. 	 Move to using numbers within the part whole model.

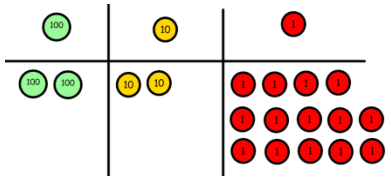
Objectives and strategies	Concrete	Pictorial	Abstract
Y1 **How to teach subtraction by:** Bridging 10	14 – 9 =  Make 14 on the ten frame. Take away the four first to make 10 and then takeaway one more so you have taken away 5. You are left with the answer of 9.	 Start at 13. Take away 3 to reach 10. Then take away the remaining 4 so you have taken away 7 altogether. You have reached your answer.	16 – 8= How many do we take off to reach the next 10? How many do we have left to take off?
Y1 and Y2 Regroup a 10 into ten ones	 For the calculation 20-4=16. Using a place value chart, represent the number with base 10. Show how to exchange a ten for ten ones.		20 - 4 = 16

Objectives and strategies	Concrete	Pictorial	Abstract
National Curriculum Programme of Study Statements :add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a 2-digit number and ones a 2-digit number and tens two 2-digit numbers adding three 1-digit numbers show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot			
Y2 **How to teach subtraction using:** Partitioning to Subtract without regrouping	Use base 10 to model how to partition the number when subtracting. 34-13= 	Children can also record the calculations using their own drawings of the Base 10 equipment (as slanted lines for the 10 rods and dots for the unit blocks), e.g. to calculate 39 – 17 children would draw 39 as 3 tens (lines) and 4 ones (dots) and would cross out 7 ones and then one ten, counting up the answer of 2 tens and 2 units to give 22.  Circling the tens and units that remain will help children to identify how many remain.	39 -17=22

Objectives and strategies	Concrete	Pictorial	Abstract
Y2 **How to teach subtraction using:** Partitioning to subtract with regrouping	When the amount of ones to be subtracted is greater than the ones in the original number, an exchange method is required. This relies on children's understanding of ten ones being an equivalent amount to one ten. To calculate 53 – 26, by using practical equipment, they would count out 53 using the tens and ones, as in Step 1. They need to consider whether there are enough ones to remove 6. In this case there are not so they need to exchange a ten into ten ones to make sure that there are enough, as in step 2.  The children can now see the 53 represented as 40 and 13, still the same total, but partitioned in a different way, as in step 3 and can go on to take away the 26 from the calculation to leave 27 remaining, as in Step 4 	When recording their own drawings, when calculating 37 – 19, children would cross out a ten and exchange for ten ones. The exchanged ten is denoted with an **e** so children recognise this has not been subtracted. Drawing the ones in a diagonal line, as in Step 2, ensures that children create ten ones and do not get them confused with the ones that were already in place. 	37-19=18

Objectives and strategies	Concrete	Pictorial	Abstract
Children will build on their knowledge of using Base 10 equipment from year 2 and continue to use the idea of exchange. This process should be demonstrated using arrow cards, place value counters and Base 10 materials to represent the first number, removing the ones and tens as appropriate (as with the more informal method in year 2).			
National Curriculum Programme of Study Statements: add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction			
Y3 **How to teach Column method:** without regrouping using base 10 and arrow cards	Use Base 10 to make the bigger number then take the smaller number away. Step 1  Step 2  Step 3  	Children can also use jottings of the Base 10 materials (as in year 2) to support with their calculation, as in the example below.  	89 -57

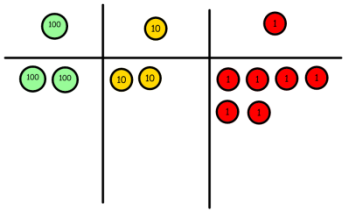
Y3 **How to teach: Column method** without regrouping using place value counters TO and -TO HTO - TO	. Show how you partition numbers to subtract. Again make the larger number first. 	 working. 	Draw the Base 10 or place value counters alongside the written calculation to help to show	This will lead to a clear written column subtraction.
Column method with regrouping HTO -HTO	Use Base 10 to start with before moving on to place value counters. Start with one exchange before moving onto subtractions with 2 exchanges. 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.		**<u>Draw the counters</u>** 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. Step 1 700 → 50 → 4 - 200 → 80 → 6 Step 2 (exchanging from tens to units) 700 → 40 → 14 - 200 → 80 → 6



Calculations

234
- 88

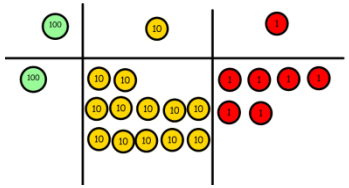
Now I can subtract my ones.



Calculations

234
- 88

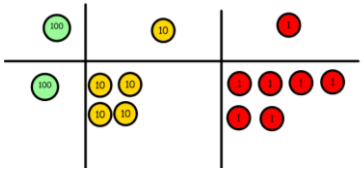
Now look at the tens, can I take away 8 tens easily? I need to exchange one hundred for ten tens.



Calculations

234
- 88

Now I can take away eight tens and complete my subtraction



Calculations

234
- 88
146

Show children how the concrete method links to the written method alongside your working. Cross out the numbers when exchanging and show where we write our new amount.

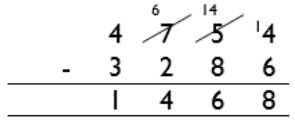
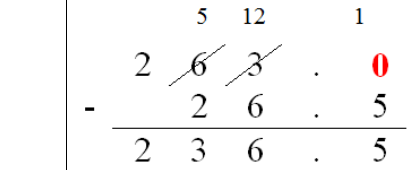
Step 3 (exchanging from hundreds to tens)

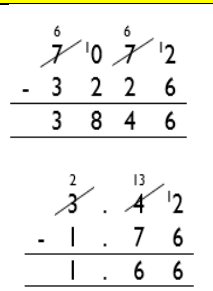
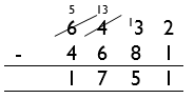
600 140
~~700~~ → ~~50~~ → 14
- 200 → 80 → 6

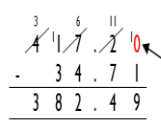
Children will move to year 4 using whichever method they were using as they transitioned from year 3. When children are ready, this leads on to the compact method of decomposition .
By the end of year 4, children should be using the written method confidently and with understanding. They will also be subtracting:

- numbers with different numbers of digits, understanding the place value;
- *decimals with one decimal place, knowing that the decimal points line up under one another.*

National Curriculum Programme of Study Statements: Pupils should be taught to: add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate solve addition and subtraction two-step problems in context, deciding which operations and methods to use and why.

Objective and Strategies	Concrete	Pictorial	Abstract
Y4	If children are still struggling with understanding the formal method take them back to the concrete methods taught in Y3	If children are still struggling with understanding the formal method take them back to the pictorial methods taught in Y3	Moving forward the children use a more compact method.  This will lead to an understanding of subtracting any number including  decimals.

Objective and Strategies	Concrete	Pictorial	Abstract
Children will be subtracting: • numbers with different numbers of digits, understanding the place value; • *decimals with up to two decimal places (with each number having the same number of decimal places), knowing that the decimal points line up under one another.* • amounts of money and measures, including those where they have to initially convert from one unit to another.			
National Curriculum Programme of Study Statements: Pupils should be taught to: add and subtract whole numbers with more than four digits, including using formal written methods (columnar addition and subtraction) add and subtract numbers mentally with increasingly large numbers (e.g. 12 462 – 2300 = 10 162)			
Y5	If children are still struggling with understanding the formal method take them back to the concrete methods taught in Y3	If children are still struggling with understanding the formal method take them back to the pictorial methods taught in Y3.	
Children should extend the decomposition method and use it to subtract whole numbers and decimals with any number of digits. They will also be subtracting: • numbers with different numbers of digits, understanding the place value; • *decimals with up to two decimal places (with mixed numbers of decimal places), knowing that the decimal points line up under one another.* • amounts of money and measures, including those where they have to initially convert from one unit to another.			
National Curriculum Programme of Study Statements: pupils should be taught to: solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy			
Y6 Subtract whole numbers and decimals using formal written methods (columnar subtraction).			

			 When subtracting decimals with different numbers of decimal places, children should be taught and encouraged to make them the same through identification that 2 tenths is the same as 20 hundredths, therefore, 0.2 is the same value as 0.20.