Maths Calculation Policy: Subtraction

The following pages show the *Power Maths White Rose Edition* progression in addition and how this works in line with the National Curriculum. The consistent use of the CPA (concrete, pictorial, abstract) approach across *Power Maths White Rose Edition* helps children develop mastery across all the operations in an efficient and reliable way. This policy shows how these methods develop children's confidence in their understanding of both written and mental methods.

RECEPTION
Children develop the core ideas that underpin all calculation. They begin by connecting calculation with counting on and counting back, but they should learn that understanding wholes and parts will enable them to calculate efficiently and accurately, and with greater flexibility. Children record their calculations in their own ways, there is no expectation of number sentences at this stage; however children may choose this way to record their thinking.
Key language: first, then, now, subtract, subtraction, find the difference, take away, minus, left, less, more, fewer, equal, equals, is equal to
Subtraction: Children start to explore subtraction by sorting groups. They use sorting to develop their understanding of parts and wholes. When comparing groups, children use the language more than and fewer than. This will lead to finding the difference when they move into KS1. Children then connect subtraction with the idea of counting back and finding one less using a five frame to support their thinking. They explore subtraction by breaking apart a whole to find a missing part. This links to their developing recall of number bonds. Children count back within 20 using number tracks and ten frames to see the effect of taking away.

KEY STAGE 1

Children develop the core ideas that underpin all calculation. They begin by connecting calculation with counting on and counting back, but they should learn that understanding wholes and parts will enable them to calculate efficiently and accurately, and with greater flexibility. They learn how to use an understanding of 10s and 1s to develop their calculation strategies, especially in addition.

Key language: subtract, subtraction, find the difference, take away, minus, less, more, group, share

Addition: Children first learn to connect addition and subtraction with counting, but they soon develop two very important skills: an understanding of parts and wholes, and an understanding of unitising 10s, to develop efficient and effective calculation strategies based on known number bonds and an increasing awareness of place value. Addition and subtraction are taught in a way that is interlinked to highlight the link between the two operations.

A key idea is that children will select methods and approaches based on their number sense. For example, in Year 1, when faced with 15 − 3 and 15 − 13, they will adapt their ways of approaching the calculation appropriately. The teaching should always emphasise the importance of mathematical thinking to ensure accuracy and flexibility of approach, and the importance of using known number facts to harness their recall of bonds within 20 to support both addition and subtraction methods.

LOWER KEY STAGE 2

Key language: partition, place value, tens, hundreds, thousands, column method, whole, part, equal groups, sharing, grouping, bar model**.**

Addition: In Year 3 especially, the column methods are built up gradually. Children will develop their understanding of how each stage of the calculation relates to place value. The example calculations chosen to introduce the stages of each method may often be more suited to a mental method. However, the examples and the progression of the steps have been chosen to help children develop their fluency in the process, alongside a deep understanding of the concepts and the numbers involved, so that they can apply these skills accurately and efficiently to later calculations. The class should be encouraged to compare mental and written methods for specific calculations, and children should be encouraged at every stage to make choices about which methods to apply.
In Year 4, the steps are shown without such fine detail, although children should continue to build their understanding with a secure basis in place value.

By the end of Year 4, children should have developed fluency in column methods alongside a deep understanding, which will allow them to progress confidently in upper Key Stage 2.

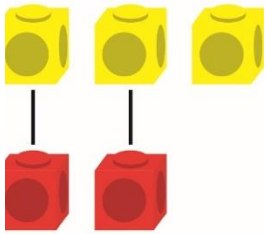
UPPER KEY STAGE 2

Key language: decimal, column methods, exchange, partition, mental method, ten thousand, hundred thousand, million, factor, multiple, prime number, square number, cube number

Children build on their column methods to add numbers with up to seven digits, and they adapt the methods to calculate efficiently and effectively with decimals, ensuring understanding of place value at every stage.

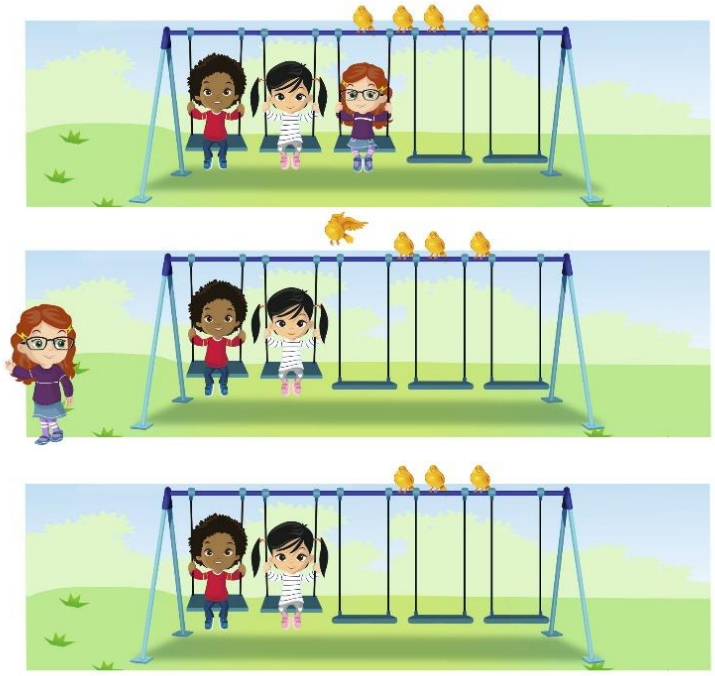
Children compare and contrast methods, and they select mental methods or jottings where appropriate and where these are more likely to be efficient or accurate when compared with formal column methods.

Bar models are used to represent the calculations required to solve problems and may indicate where efficient methods can be chosen.

Reception		
	Real-life representation	**Other representations**
Subtraction	Comparing groups Children line up objects to compare the amount. They line the objects up either horizontally or vertically.  *Ella has more conkers.* *Tom has fewer conkers.*	Comparing groups Children line up cubes or counters to compare the amount in each group. Lines can either be horizontal or vertical. A starting line helps to line the objects accurately.  *There are more yellow cubes.* *There are fewer red cubes.*

Counting back and taking away (within 5)

Children remove one more person or object from a group to find one less.



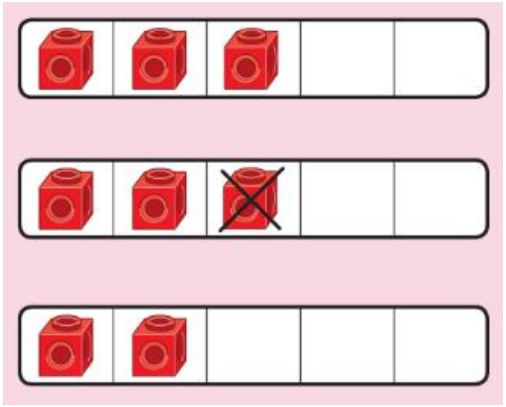
First, there were 3 children.

Then, 1 child left.

Now, there are 2 children.

Counting back and taking away (within 5)

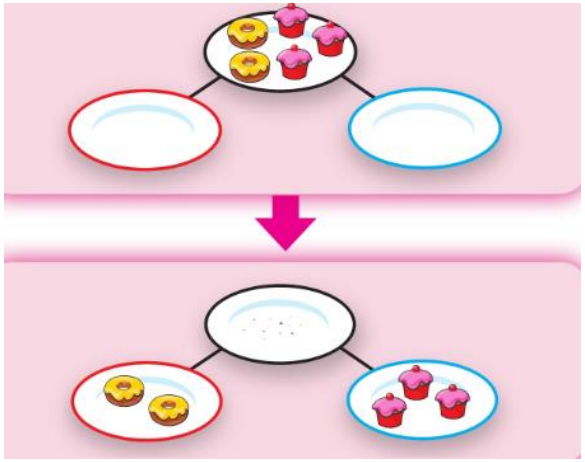
Children use five frames and objects to make a number. They then remove or cross out one object to find one less.



One less than 3 is 2.

Introducing the part-whole model

Children sort everyday objects into parts.

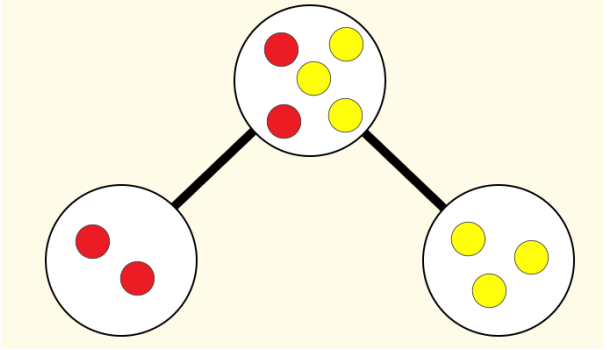


One part is the 

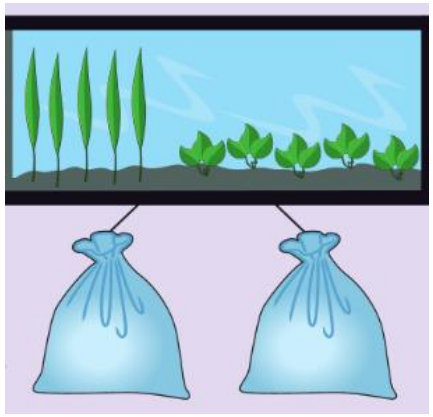
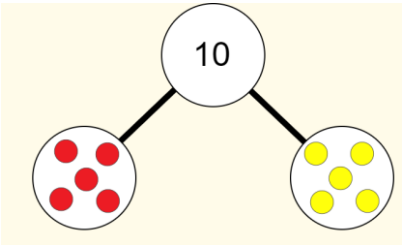
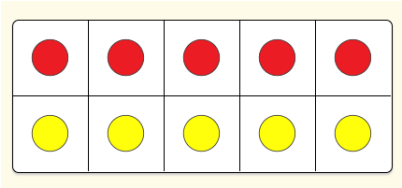
The other part is the 

Introducing the part-whole model

Children use counters or cubes to represent objects in a part-whole model.



The whole is 5.
2 is a part.
3 is a part.

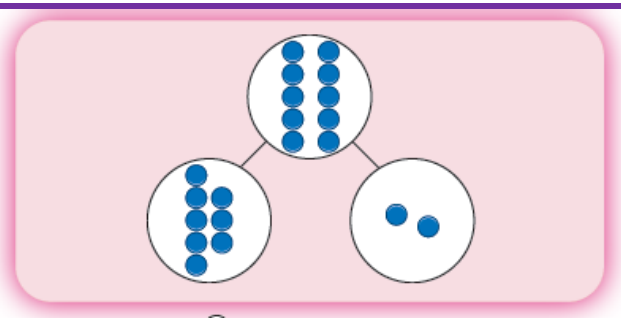
	Finding number bonds to 10 Children partition 10 into different groups to find the number bonds to 10.  Children begin to work with subtraction number bonds. They **break apart 10 to identify different number bonds to 10.**	**Finding number bonds to 10** Children use part-whole models, ten frames and counters to find the number bonds to 10.  *10 is the whole.* *5 is a part and 5 is a part.*  *10 is the whole.* *5 is a part and 5 is a part.* Children use part-whole models, and counters to find missing parts and the subtraction number bonds to 10**.**

10 are bouncing.

2 get off.

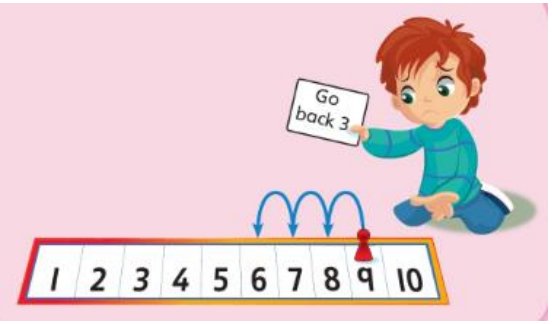
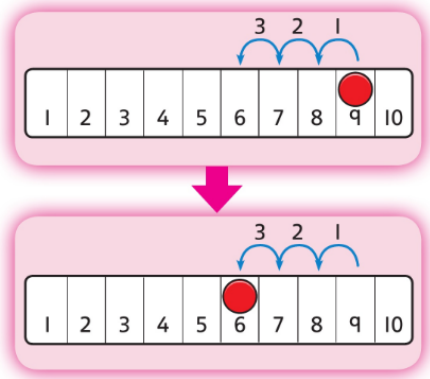
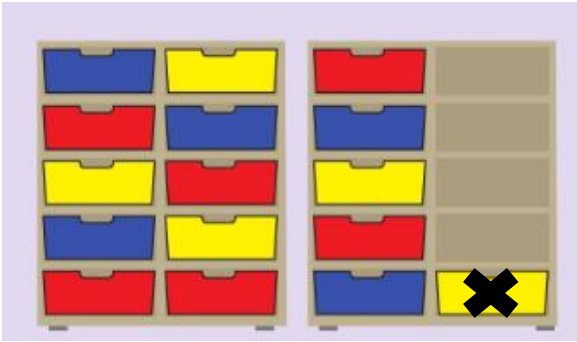
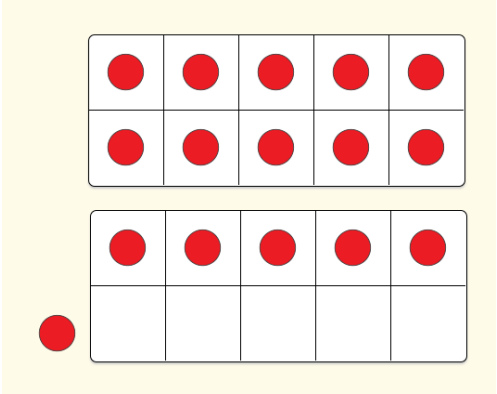
8 are left.

10 – 2 = 8

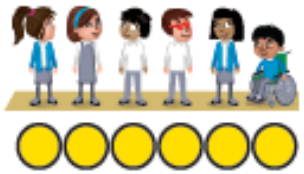
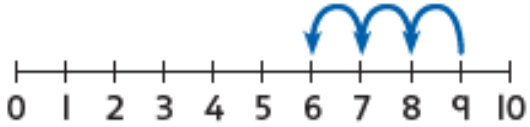
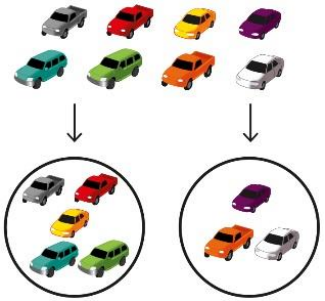
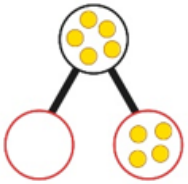
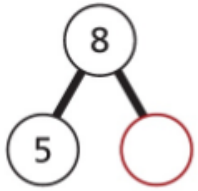
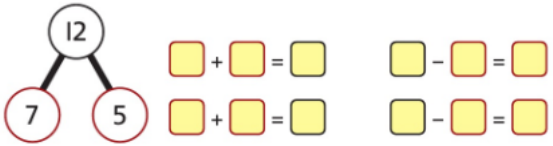


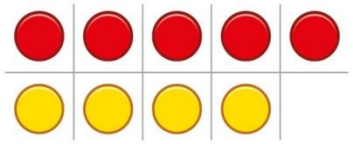
The parts are 8 and 2.

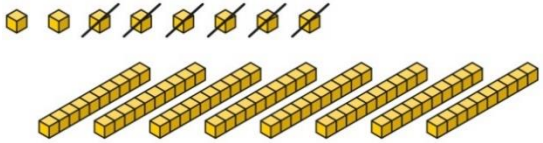
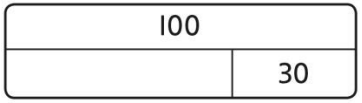
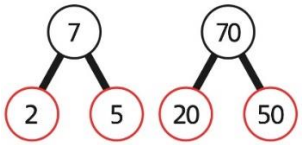
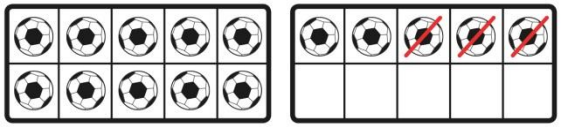
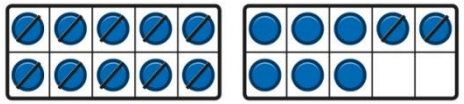
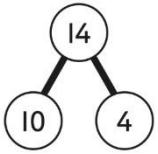
10 is the whole.

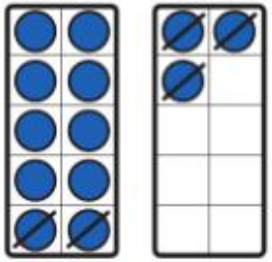
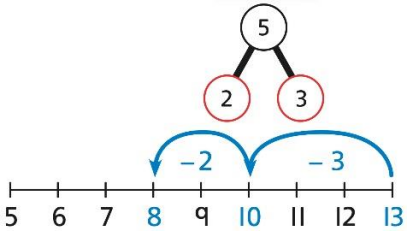
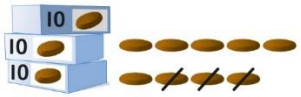
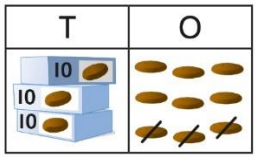
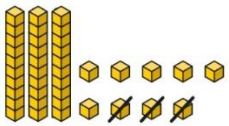
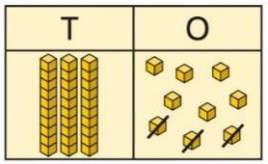
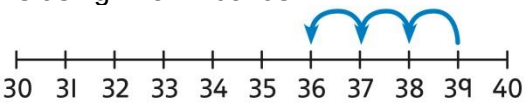
	Counting back and taking away (number track) Children use game boards and human number tracks to subtract by counting back.  *9 take away 3 equals 6* *9…8…7…6*	**Counting back and taking away (number track)** Children use a number track and a counter. They start at the larger number and count back the smaller number to find the answer.  *9 take away 3 equals 6* *9…8…7…6*
	Counting back and taking away (ten frames) Children count backwards to find one less with numbers up to 20.  *One less than 16 is 15.*	**Counting back and taking away (ten frames)** Children remove counters from ten frames to support in counting back with numbers up to 20.  *One less than 16 is 15.*

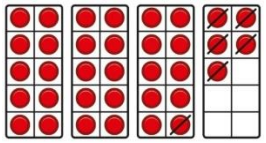
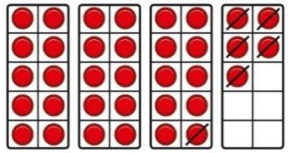
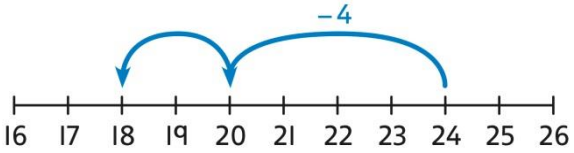
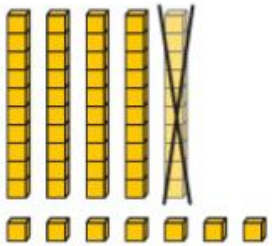
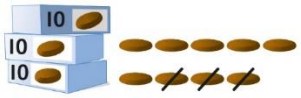
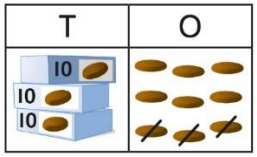
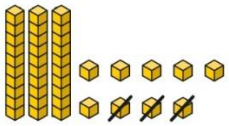
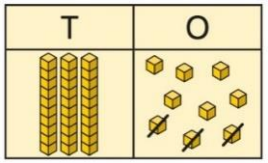
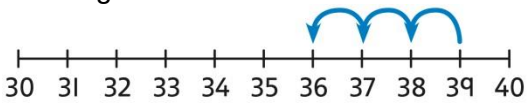
	Sorting groups (optional) Children sort everyday objects into groups. 	

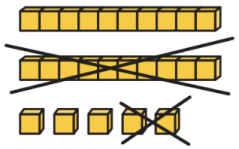
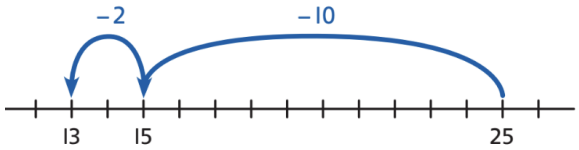
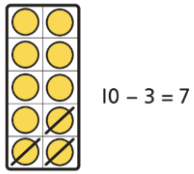
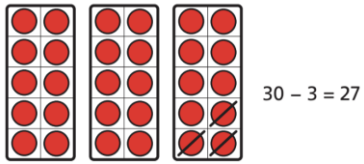
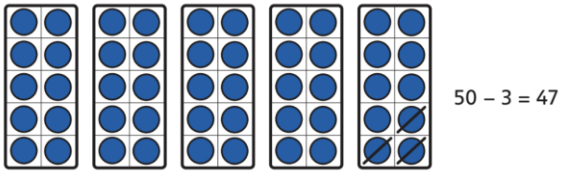
Year 1			
	Concrete	**Pictorial**	**Abstract**
Year 1 Subtraction			
Counting back and taking away	Children arrange objects and remove to find how many are left.  *1 less than 6 is 5.* *6 subtract 1 is 5.*	Children draw and cross out or use counters to represent objects from a problem.  Now there are 6 children.	Children count back to take away and use a number line or number track to support the method.  *9 − 3 = 6*
Finding a missing part, given a whole and a part	Children separate a whole into parts and understand how one part can be found by subtraction.  *8 − 5 = ?*	Children represent a whole and a part and understand how to find the missing part by subtraction.   	Children use a part-whole model to support the subtraction to find a missing part.  *8 − 5 = ?* Children develop an understanding of the relationship between addition and subtraction facts in a part-whole model. 
Finding the difference	Arrange two groups so that the difference between the groups can be worked out.	Represent objects using sketches or counters to support finding the difference.	Children understand 'find the difference' as subtraction.

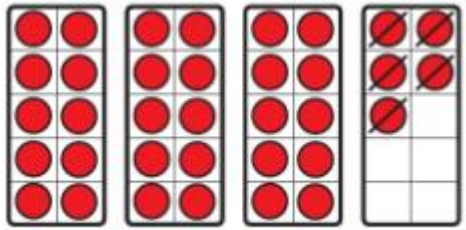
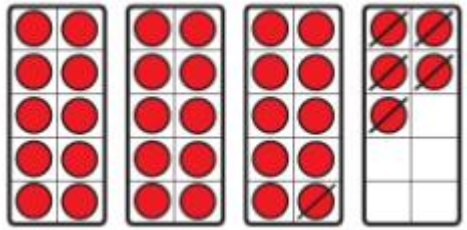
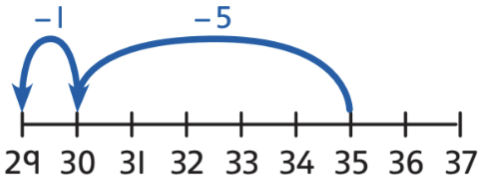
	 *8 is 2 more than 6.* *6 is 2 less than 8.* *The difference between 8 and 6 is 2.*	 *5 − 4 = 1* *The difference between 5 and 4 is 1.*	 *10 − 4 = 6* *The difference between 10 and 6 is 4.*

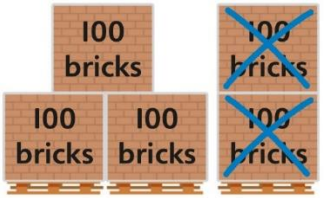
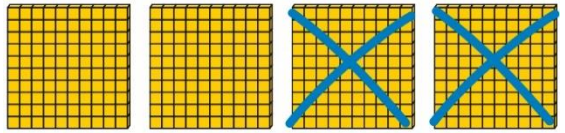
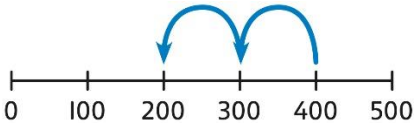
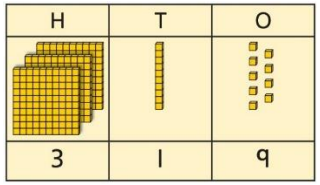
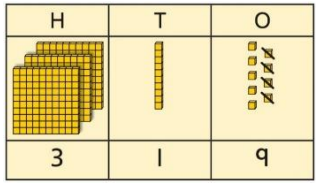
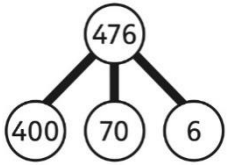
Year 2			
	Concrete	**Pictorial**	**Abstract**
Year 2 Subtraction			
Subtract two multiples of 10	Use known number bonds and unitising to subtract multiples of 10.  *8 subtract 6 is 2.* *So, 8 tens subtract 6 tens is 2 tens.*	Use known number bonds and unitising to subtract multiples of 10.  *10 − 3 = 7* *So, 10 tens subtract 3 tens is 7 tens.*	Use known number bonds and unitising to subtract multiples of 10.  *7 tens subtract 5 tens is 2 tens.* *70 − 50 = 20*
Subtraction within 20	**Subtraction within 20** Understand when and how to subtract 1s efficiently.  *5 − 3 = 2* *15 − 3 = 12*	**Subtraction within 20** Understand how to use knowledge of bonds within 10 to subtract efficiently. *5 − 3 = 2* *15 − 3 = 12*	**Subtraction within 20** Understand when and how to subtract 1s efficiently. Use a bead string to subtract 1s efficiently.  *5 − 3 = 2* *15 − 3 = 12*
Subtracting 10s and 1s	**Subtracting 10s and 1s** For example: 18 − 12 Use ten frames to represent the efficient method of subtracting 12. 	**Subtracting 10s and 1s** Use a part-whole model to support the calculation.  *19 − 14*	**Subtracting 10s and 1s** For example: 18 − 12 *First subtract the 10, then take away 2.*

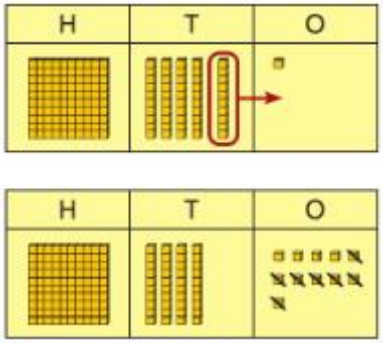
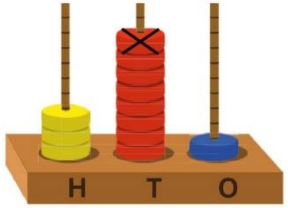
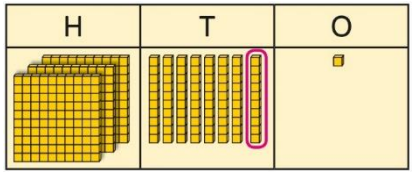
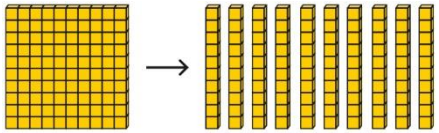
	First subtract the 10, then subtract 2.	*19 − 10 = 9* *9 − 4 = 5* *So, 19 − 14 = 5*	
Subtraction bridging 10 using number bonds .	**Subtraction bridging 10 using number bonds** Represent the use of bonds using ten frames.  *For 13 – 5, I take away 3 to make 10, then take away 2 to make 8.*	**Subtraction bridging 10 using number bonds** Use a number line and a part-whole model to support the method. *13 − 5* 	**Subtraction bridging 10 using number bonds** For example: 12 − 7 Arrange objects into a 10 and some 1s, then decide on how to split the 7 into parts. *7 is 2 and 5, so I take away the 2 and then the 5.*
Subtracting a single-digit number	Subtract the 1s. This may be done in or out of a place value grid using classroom items to represent the numbers.   “9 ones subtract 3 ones is 6 ones” 39 – 3 = 36	Subtract the 1s. This may be done in or out of a place value grid.   “9 ones subtract 3 ones is 6 ones” 39 – 3 = 36	Subtract the 1s. Understand the link between counting back and subtracting the 1s using known bonds.  *9 − 3 = 6* *39 − 3 = 36*
Subtracting a single-digit	Bridge 10 by using known bonds.	Bridge 10 by using known bonds.	Bridge 10 by using known bonds.

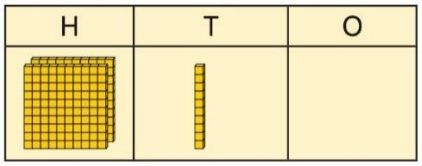
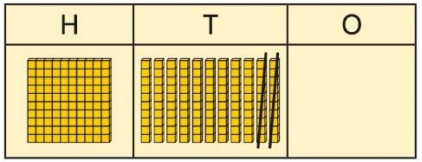
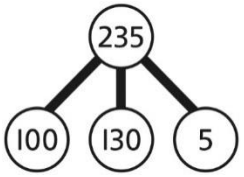
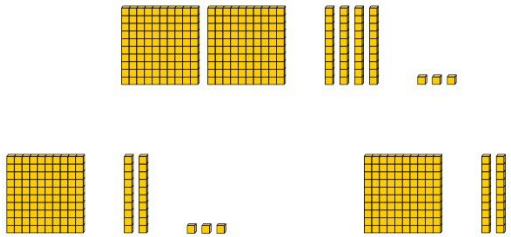
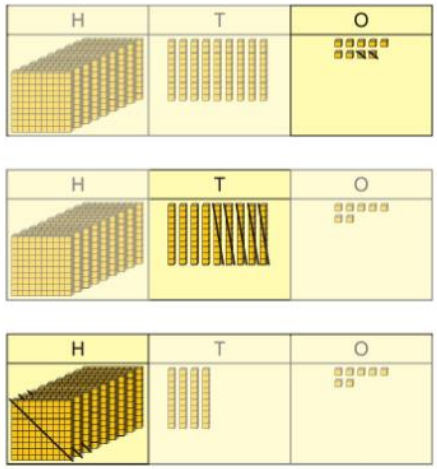
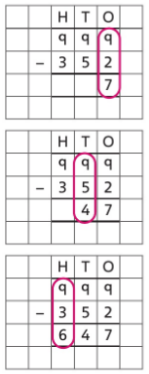
number bridging 10	 *35 − 6* *I took away 5 counters, then 1 more.*	 *35 − 6* *First, I will subtract 5, then 1.*	 *24 − 6 = ?* *24 − 4 − 2 = ?*
Subtract tens from a 2-digit number		Subtract tens using known bonds  57 – 10 = 47	Subtract tens using known bonds *43 – 10 = 33*
Subtract ones from a 2-digit number	Subtract the 1s. This may be done in or out of a place value grid.   *9 ones subtract 3 ones is 6 ones.* *39 – 3 = 36*	Subtract the 1s. This may be done in or out of a place value grid.   *9 ones subtract 3 ones is 6 ones.* *39 – 3 = 36*	Subtract the 1s. Understand the link between counting back and subtracting the 1s using known bonds.  *9 − 3 = 6* *39 − 3 = 36*

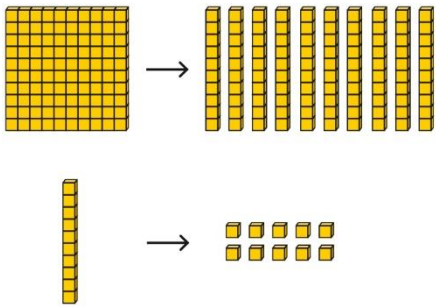
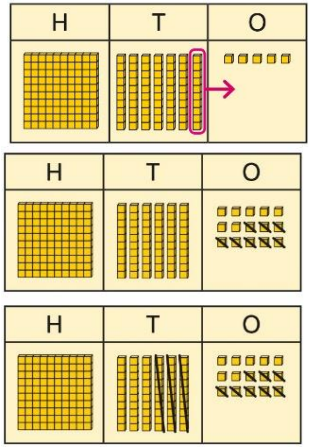
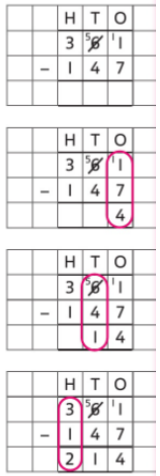
Subtract tens and ones from a 2-digit number	Subtract 10s then 1s using place value equipment.  *25 – 10 – 2 = 13* *25 – 12 = 13*	Subtract 10s then 1s with a number line for visual support.  *25 – 10 – 2 = 13* *25 – 12 = 13*	Subtract 10s then 1s. *25 – 10 – 2 = 13* *25 – 12 = 13*
Subtract ones from a multiple of 10 (preparation for bridging)	Subtract from a 10 using known bonds to 10 using place value equipment.   	Subtract from a 10 using known bonds to 10.  *50 – 2 = 48*	Subtract from a 10 using known bonds to 10. *10 – 3 = 7* *30 – 3 = 27* *60 – 3 = 57* *90 – 3 = 87*
Subtract bridging a ten	Subtract in two steps, across a 10 with place value equipment.	Subtract in two steps, across a 10 with a number line for visual support.	Subtract in two steps, across a 10. *41 – 6 = 41 – 1 – 5*

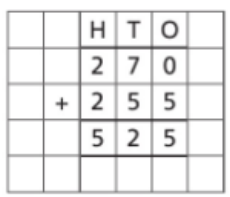
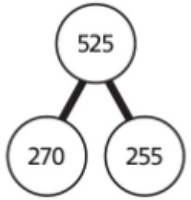
	 35 – 5 = 30 	 35 – 5 – 1 = 29	*41 – 6 = 35*

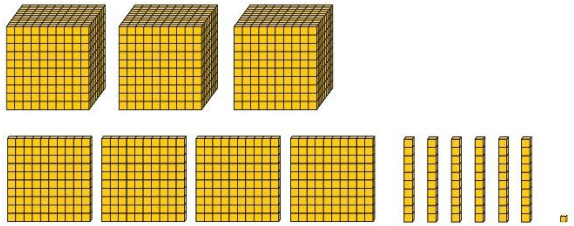
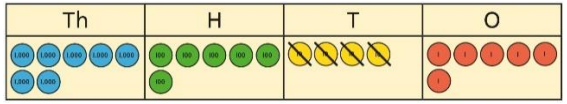
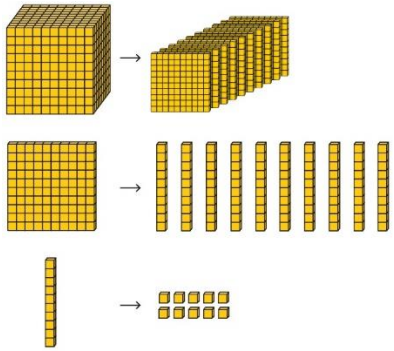
Year 3			
	Concrete	**Pictorial**	**Abstract**
Year 3 Subtraction			
Subtracting 100s	Use known facts and unitising to subtract multiples of 100.  *5 − 2 = 3* *500 − 200 = 300*	Use known facts and unitising to subtract multiples of 100.  *4 − 2 = 2* *400 − 200 = 200*	Understand the link with counting back in 100s.  *400 − 200 = 200* Use known facts and unitising as efficient and accurate methods. I know that 7 − 4 = 3. Therefore, I know that 700 − 400 = 300.
3-digit number − 1s, no exchange	Use number bonds to subtract the 1s.  *214 − 3 = ?*  *4 − 3 = 1* *214 − 3 = 211*	Use number bonds to subtract the 1s.  *319 − 4 = ?*  *9 − 4 = 5* *319 − 4 = 315*	Understand the link with counting back using a number line. Use known number bonds to calculate mentally. *476 − 4 = ?*  *6 − 4 = 2* *476 − 4 = 472*

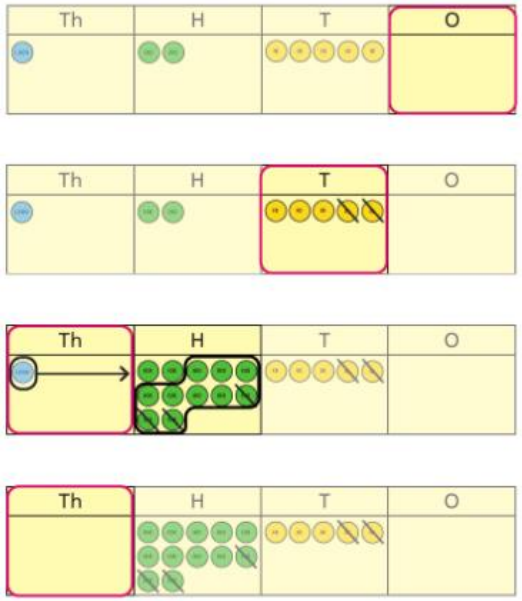
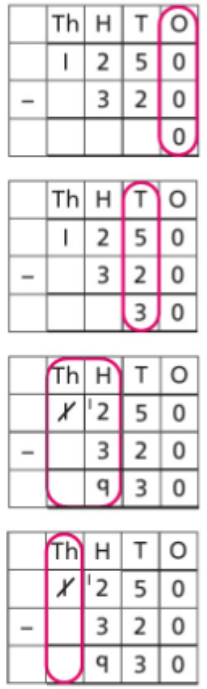
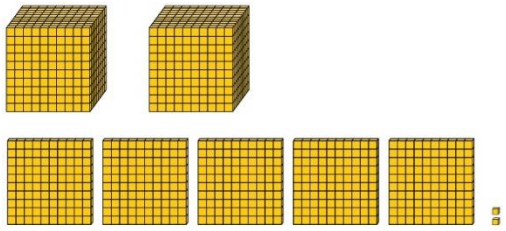
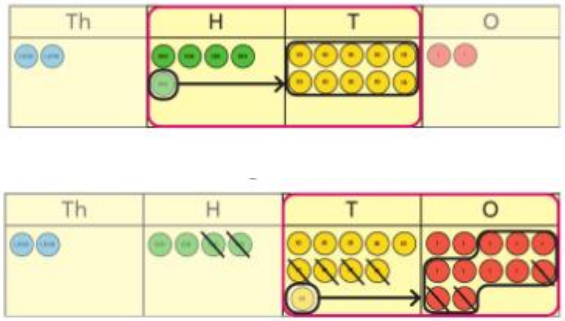
3-digit number − 1s, exchange or bridging required	Understand why an exchange is necessary by exploring why 1 ten must be exchanged. Use place value equipment.	Represent the required exchange on a place value grid. *151 − 7 = ?* 	Calculate mentally by using known bonds. *151 − 7 = ?* 151 − 1 − 6 = 144
3-digit number − 10s, no exchange	Subtract the 10s using known bonds.  *381 − 10 = ?* *8 tens with 1 removed is 7 tens.* *381 − 10 = 371*	Subtract the 10s using known bonds.  *8 tens − 1 ten = 7 tens* *381 − 10 = 371*	Use known bonds to subtract the 10s mentally. *372 − 50 = ?* *70 − 50 = 20* *So, 372 − 50 = 322*
3-digit number − 10s, exchange or bridging required	Use equipment to understand the exchange of 1 hundred for 10 tens. 	Represent the exchange on a place value grid using equipment. *210 − 20 = ?*	Understand the link with counting back on a number line. Use flexible partitioning to support the calculation. *235 − 60 = ?*

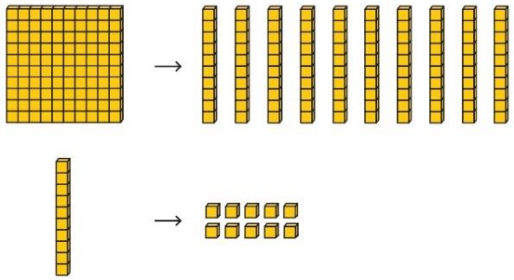
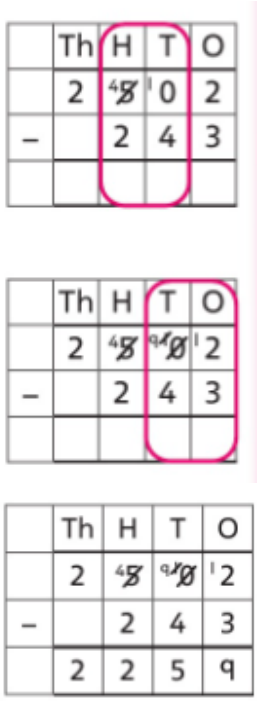
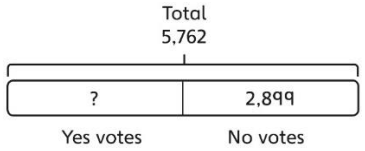
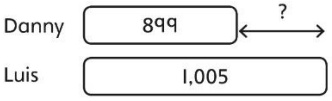
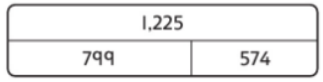
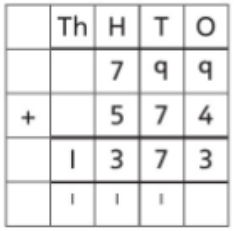
		 *I need to exchange 1 hundred for 10 tens, to help subtract 2 tens.*  *210 − 20 = 190*	 *235 = 100 + 130 + 5* *235 − 60 = 100 + 70 + 5* = 175
3-digit number − up to 3-digit number	Use place value equipment to explore the effect of splitting a whole into two parts, and understand the link with taking away. 	Represent the calculation on a place value grid. 	Use column subtraction to calculate accurately and efficiently. 
3-digit number − up to 3-digit number, exchange required	Use base 10 equipment to enact the exchange of 1 hundred for 10 tens, and 1 ten for 10 ones.	*Model the required exchange on a place value grid.* *175 − 38 = ?* *I need to subtract 8 ones, so I will exchange a ten for 10 ones.*	Use column subtraction to work accurately and efficiently.

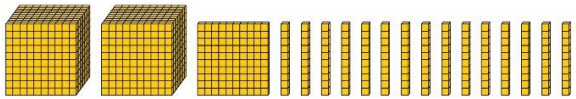
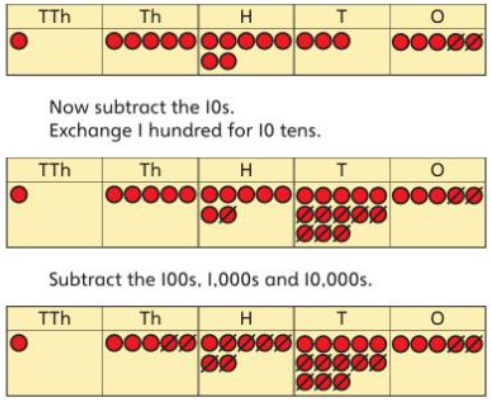
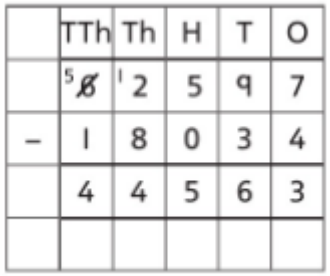
			 If the subtraction is a 3-digit number subtract a 2-digit number, children should understand how the recording relates to the place value, and so how to line up the digits correctly. Children should also understand how to exchange in calculations where there is a zero in the 10s column.
Representing subtraction problems		Use bar models to represent subtractions. 'Find the difference' is represented as two bars for comparison.  Bar models can also be used to show that a part must be taken away from the whole.	Children use alternative representations to check calculations and choose efficient methods. Children use inverse operations to check additions and subtractions. The part-whole model supports understanding. *I have completed this subtraction.* *525 − 270 = 255* *I will check using addition.*

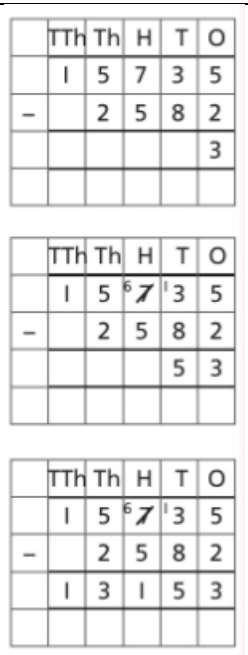
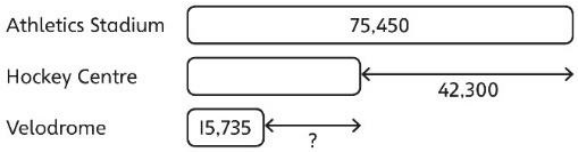
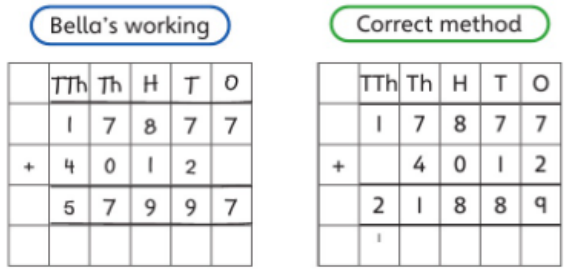
			 H T O 2 7 0 + 2 5 5 5 2 5  525 270 255

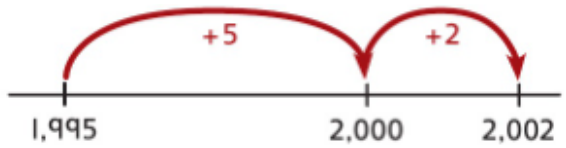
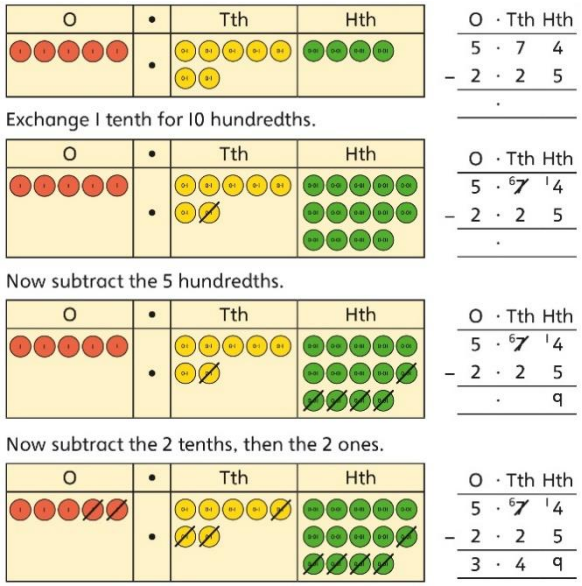
Year 4			
	Concrete	**Pictorial**	**Abstract**
Year 4 Subtraction			
Choosing mental methods where appropriate	Use place value equipment to justify mental methods.  *What number will be left if we take away 300?*	Use place value grids to support mental methods where appropriate.  *7,646 − 40 = 7,606*	Use knowledge of place value and unitising to subtract mentally where appropriate. *3,501 − 2,000* *3 thousands − 2 thousands = 1 thousand* 3,501 − 2,000 = 1,501
Column subtraction	Understand why exchange of a 1,000 for 100s, a 100 for 10s, or a 10 for 1s may be necessary. 	Represent place value equipment on a place value grid to subtract, including exchanges where needed.	Use column subtraction, with understanding of the place value of any exchange required.

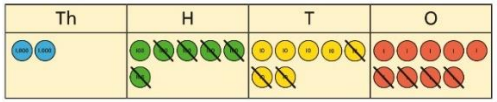
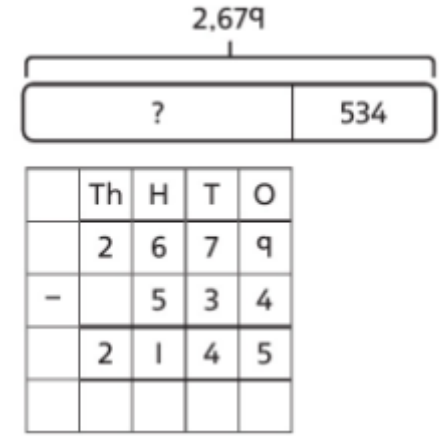
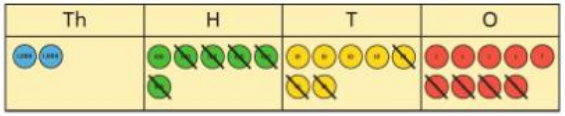
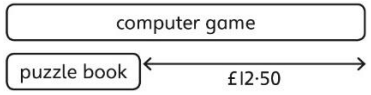
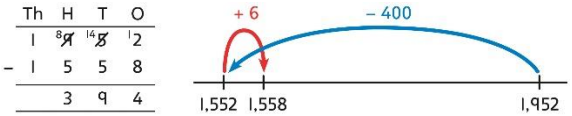
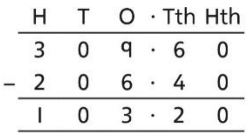
			
Column subtraction with exchange across more than one column	Understand why two exchanges may be necessary. *2,502 − 243 = ?*  *I need to exchange a 10 for some 1s, but there are not any 10s here.*	Make exchanges across more than one column where there is a zero as a place holder. *2,502 − 243 = ?* 	Make exchanges across more than one column where there is a zero as a place holder. *2,502 − 243 = ?*

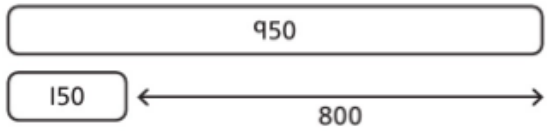
			
Representing subtractions and checking strategies		Use bar models to represent subtractions where a part needs to be calculated.  *I can work out the total number of Yes votes using 5,762 − 2,899.* Bar models can also represent 'find the difference' as a subtraction problem. 	Use inverse operations to check subtractions. *I calculated 1,225 − 799 = 574.* *I will check by adding the parts.*   *The parts do not add to make 1,225.* *I must have made a mistake.*

Year 5			
	Concrete	**Pictorial**	**Abstract**
Year 5 Subtraction			
Column subtraction with whole numbers	Use place value equipment to understand where exchanges are required. *2,250 – 1,070 = ?* 	Represent the stages of the calculation using place value equipment on a grid alongside the calculation, including exchanges where required. *15,735 − 2,582 = 13,153* 	Use column subtraction methods with exchange where required.  *62,597 − 18,034 = 44,563*

			
Checking strategies and representing subtractions		Bar models represent subtractions in problem contexts, including 'find the difference'. 	Children can explain the mistake made when the columns have not been ordered correctly. Use approximation to check calculations.  *I calculated 18,000 + 4,000 mentally to check my subtraction.*
Choosing efficient methods			To subtract two large numbers that are close, children find the difference by counting on.

			2,002 − 1,995 = ?  Use addition to check subtractions. *I calculated 7,546 − 2,355 = 5,191.* *I will check using the inverse.*
Subtracting decimals	Explore complements to a whole number by working in the context of length.  1 m – ☐ m = ☐ m *1 − 0·49 = ?*	Use a place value grid to represent the stages of column subtraction, including exchanges where required. *5·74 − 2·25 = ?*  	Use column subtraction, with an understanding of place value, including subtracting numbers with different numbers of decimal places. *3·921 − 3·75 = ?* O · Tth Hth Thth 3 · 9 2 1 − 3 · 7 5 0 ·

Year 6			
	Concrete	**Pictorial**	**Abstract**
Year 6 Subtraction			
Comparing and selecting efficient methods	Use counters on a place value grid to represent subtractions of larger numbers.  	Compare subtraction methods alongside place value representations.   Use a bar model to represent calculations, including 'find the difference' with two bars as comparison.  	Compare and select methods. Use column subtraction when mental methods are not efficient. Use two different methods for one calculation as a checking strategy.  Use column subtraction for decimal problems, including in the context of measure. 
Subtracting mentally with larger numbers		Use a bar model to show how unitising can support mental calculations.	Subtract efficiently from powers of 10. *10,000 − 500 = ?*

		950,000 − 150,000 *That is 950 thousands − 150 thousands*  *So, the difference is 800 thousands.* *950,000 − 150,000 = 800,000*	