Subtraction

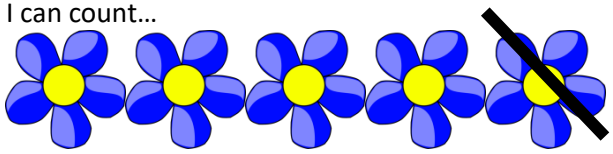
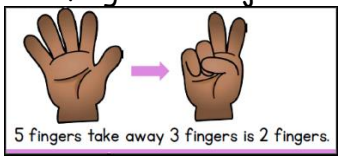
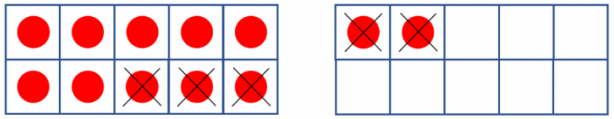
Foundation Stage 1 Objectives:

Birth to Three:

- Combine objects like stacking blocks and cups. Put objects inside others and take them out again.
- Take part in finger rhymes with numbers.
- React to changes of amounts in a group of up to three items.
- Develop counting-like behaviour, such as, making sounds, pointing or saying some numbers in sequence.

Three – Four:

- Develop fast recognition of up to 3 objects, without having to count them individually ('subitising').
- Show 'finger numbers' up to 5.
- Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5.
- Experiment with their own symbols and marks as well as numerals.
- Say one number name for each item in order: 1, 2, 3, 4, 5.
- Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').
- Solve real world mathematical problems with numbers up to 5
- Compare quantities using language 'more than', and 'fewer than'.

Concrete	Pictorial	Abstract
Use a variety of contexts, such as nursery rhymes to give purpose to the resources you use. Use of objects in the environment – remove one to show how to 'take away'. 	I can count... 	The use of nursery rhymes to count backwards in steps of one. Counting back verbally – 5, 4, 3, 2, 1... in the context of stories.
Being able to separate objects and know the total is still the same. Use fingers or objects to do this: 	Separate objects in a 5 frame: 	5 apples take away two apples leaves 3 apples. Starting to look at the abstract. 5 – 2 = 3

Foundation Stage 2 Objectives:

Reception:

Understands 'one more than/one less than' relationship between consecutive numbers.

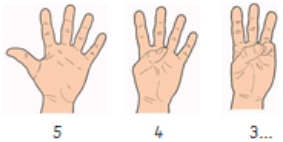
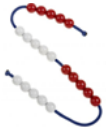
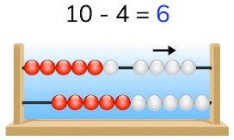
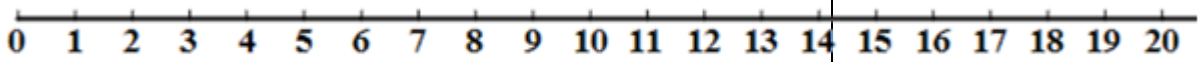
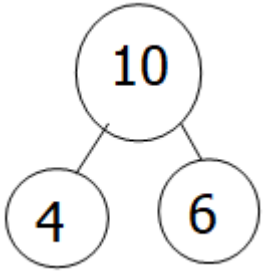
Explore the composition of numbers to 10.

Automatically recall number bonds for numbers 0 – 5 and some to 10.

Early Learning Goal:

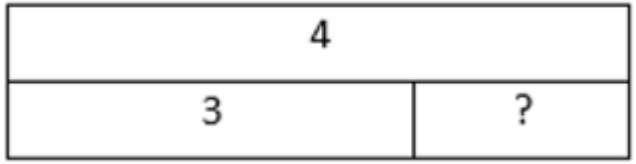
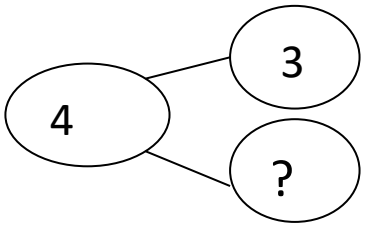
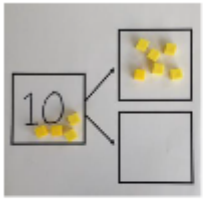
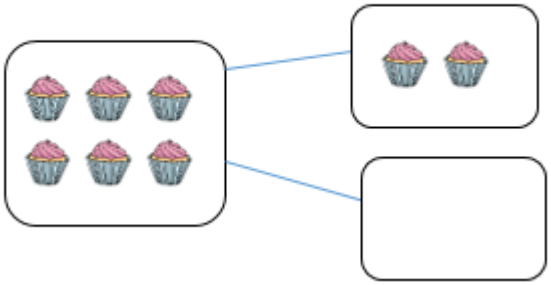
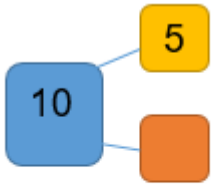
Have a deep understanding of numbers to 10, including the composition of each number.

Automatically recall number bonds to 5 and some number bonds to 10, including double facts

Concrete	Pictorial	Abstract
Subtraction using concrete objects. Hide or take away with the focus being 1 less before counting back.  Count back using out hands, bead strings, counters and rekenreks:    (6 - 2 = 4)  	Use a numberline to look at while taking away with fingers:  Pictorial representation with crossing out to show 1 less. E.g. 1 car left the car park… 	Recording number sentences after practical activities and discussions 10 - 4 =6 

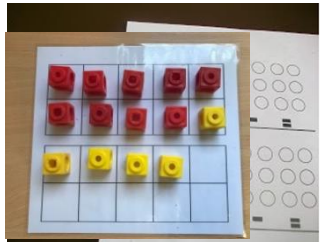
Year 1 Objectives:

- read, write and interpret mathematical statements involving subtraction (–) and equals (=) signs
- represent and use number bonds and related subtraction facts within 20
- subtract one-digit and two-digit numbers to 20, including zero
- solve one-step problems that involve subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ☐ – 9

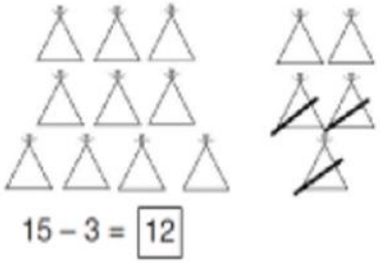
Concrete	Pictorial	Abstract
Early in Year 1, use resources such as numicon to show the whole and part. 		4 – 3 = 1 
 Link to addition- use the part whole model to help explain the inverse between addition and subtraction. If 10 is the whole and 6 is one of the parts. What is the other part? 10 - 6 =	Use a pictorial representation of objects to show the part part whole model. 	 Move to using numbers within the part whole model.

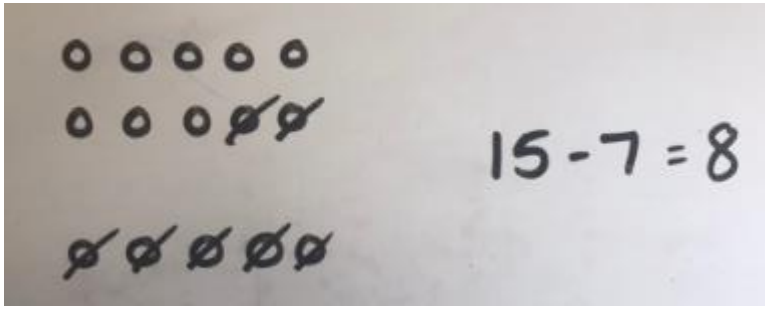
Begin with subtraction of numbers, initially with no exchange.
Make the larger number with beads, then move beads along your string as you count back.
13 – 4 =

Use resources such as tens frame and number beads to model elements of subtraction e.g. 'crossing the tens' boundary, counting back in ones.



Cross out drawn objects to show what has been taken away.

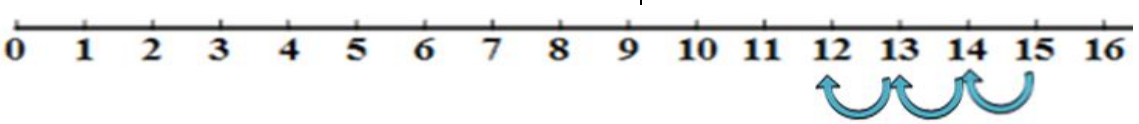




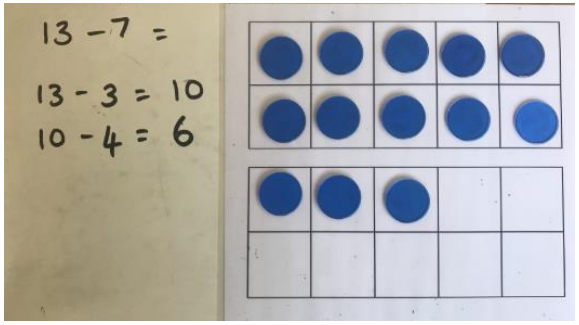
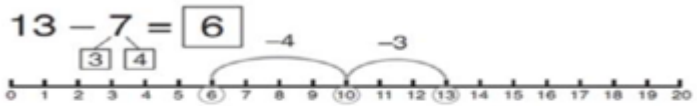
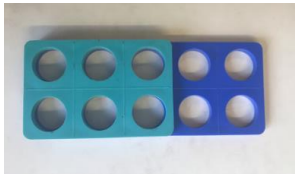
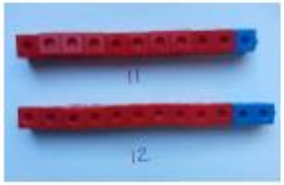
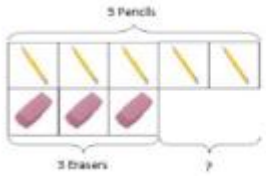
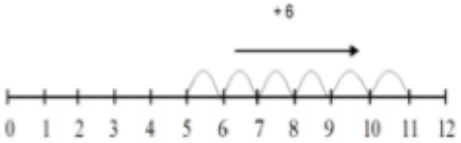
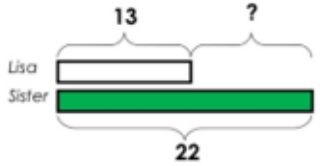
Introduce children to problem solving using missing number problems:

15 - 3 = ☐
15 - ☐ = 12
☐ - 12 = 3
☐ - ☐ = 12

Put 15 in your head, count back 3. What number are you at? Use your fingers to help.

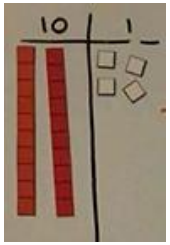
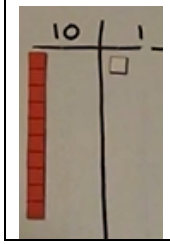
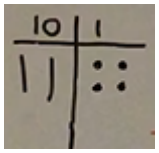
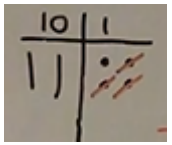
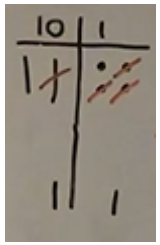
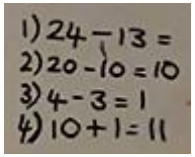
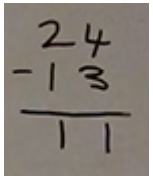


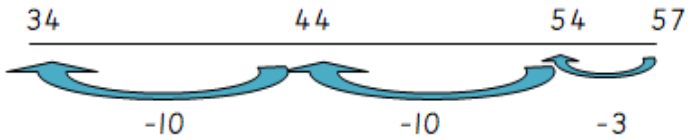
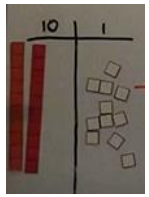
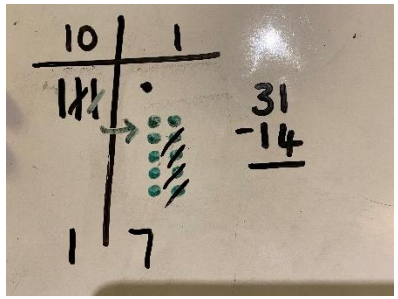
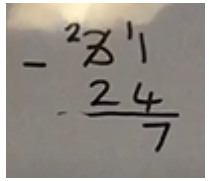
15-7 = 8

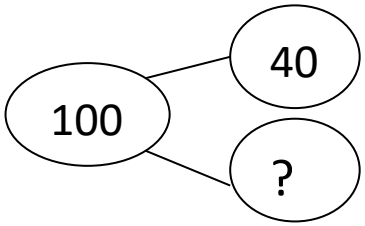
Children practise partitioning the number they are subtracting into parts which help bridge the 10. 	 Start at 13. Take away 3 to reach 10. Then take away the remaining 4 so you have taken away 7 altogether. You have reached your answer.	13 – 7 = How many do we take off to reach 10? 13 – 3 = 10 How many do we have left to take off? 10 – 4 = 6
Use numicon to find the difference between numbers. e.g. The difference between 10 and 6.  Compare amounts and objects to find the difference.  Use cubes to build towers or make bars to find the difference  Use basic bar models with items to find the difference	 Count on to find the difference. Draw bars to find the difference between 2 numbers. **Comparison Bar Models** *Lisa is 13 years old. Her sister is 22 years old. Find the difference in age between them.* 	Hannah has 22 shells; Helen has 13 shells. Find the difference between the numbers of shells. 22 – 13 = 9

Year 2 Objectives:

- solve problems with subtraction:
  - using concrete objects and pictorial representations, including those involving numbers, quantities and measures
  - applying their increasing knowledge of mental and written methods
- recall and use subtraction facts to 20 fluently, and derive and use related facts up to 100
- subtract numbers using concrete objects, pictorial representations, and mentally, including:
  - a two-digit number and ones
  - a two-digit number and tens
  - two two-digit numbers
  - adding three one-digit numbers
- show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
- recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems

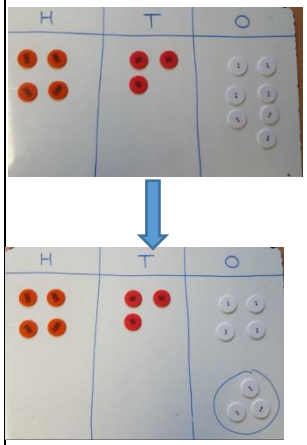
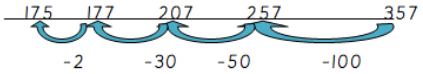
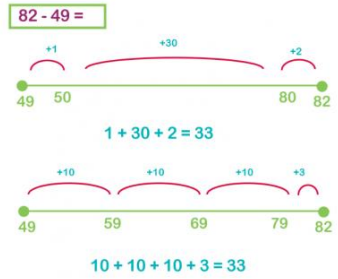
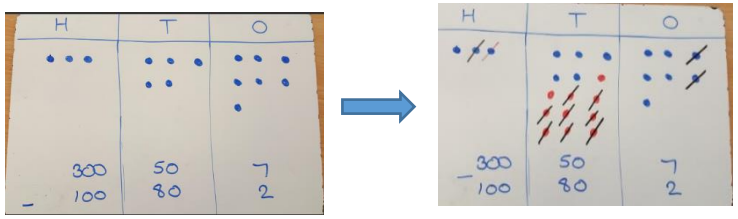
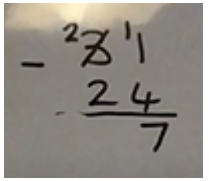
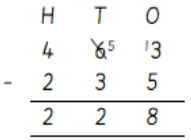
Concrete	Pictorial	Abstract
Subtract a single digit from a two digit, initially without an exchange. Example: 24 - 13 Start by using base 10 to partition the number into tens and ones:  Physically take away the 13 by taking away 3 ones and 1 ten:  	Encourage the children to use the same method as the concete, but this time drawing it. Start by drawing the tens and ones:  Cross off 3 ones and 1 ten to leave you with your answer, 11:   Progress to subtraction of two digits, without exchange. Progress on to counting back/subtraction using an unmarked number line, when place value is secure :	24 – 13:  If the children are secure, move on to extended written method (no exchange): 24 – 13: 

	E.g. 57 – 23 = 34  	
Progressing to an exchange. 31 – 24: Use base 10 to partition your start number (in this case 31):  Ask yourself if you can take away 4 ones. The answer is no, so exchange a tens stick for 10 ones:  You can now physically take away 4 ones and then 2 tens to leave you with the answer, 7:  	Repeat the process for the concrete, this time drawing lines and dots to represent the base ten. Example: 31- 14  Start by drawin 3 tens and 1 one. Can you take away 4 ones? No. Exchange 1 ten for 10 ones. Take away 4 ones and 1 ten.	When the children are secure, they can move on to a compact subtract method. Make sure your tens and ones are writtne in the correct columns. Can you take 4 away from 1? No. Take a ten away from the 3, leaving 20 in the tens column and 11 in the ones column. 11- 4 = 7 2-2 = 0 

Use part, part, whole frames to illustrate that addition and subtraction are inverse calculations – used for missing number problems.	Use part, part, whole and bar models to illustrate and secure the structures of the mathematics.  100 60 	40 + 60 = ☐ 100 = 40 - ☐ 60 = 100 - ☐

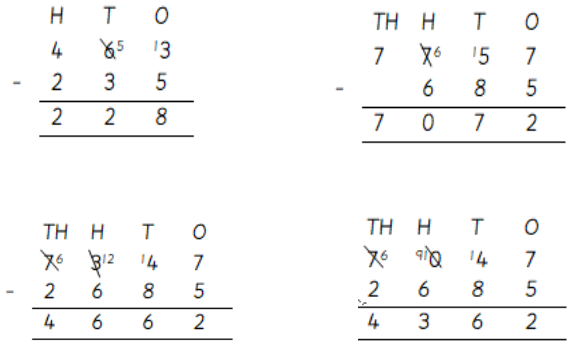
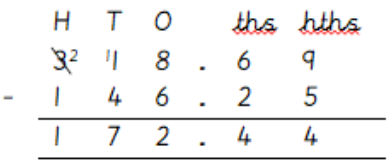
Year 3 Objectives:

- subtract numbers mentally, including:
  - a three-digit number and ones
  - a three-digit number and tens
  - a three-digit number and hundreds
- subtract numbers with up to three digits, using formal written methods of columnar subtraction
- estimate the answer to a calculation and use inverse operations to check answers
- solve problems, including missing number problems, using number facts, place value, and more complex subtraction.

Concrete	Pictorial	Abstract
Building on Year 2, using concrete resources to show subtraction, including when exchanging. Move on to three digit numbers. Example: 437 – 3 	Using number lines to subtract and count on using 3 digit numbers 357 - 182 = 175  Encourage the children to use their knowledge of number in order to subtract larger numbers. Using counting on:   (this example shows an exchange- you cannot take away 8 tens from the tens column, so you need to take 1 hundred from the hundreds column).	Extended written method: 31 – 24:  Leading to three digits: 463 – 235: 

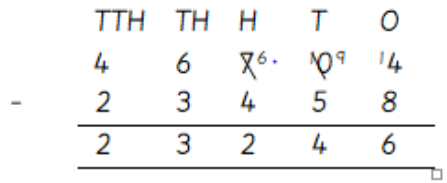
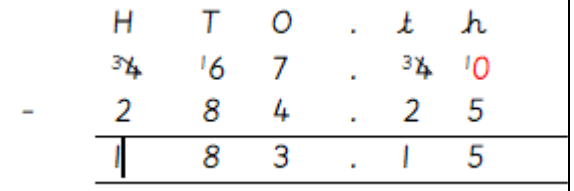
Year 4 Objectives:

- Subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate
- estimate and use inverse operations to check answers to a calculation
- solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.

Concrete	Pictorial	Abstract
Build on previous year group models and images.	Continue to explore formal columnar written method and how to exchange in order to calculate. Begin with 3 digit subtract 3 digit; moving to 4 digit subtract 3 digit and then 4 digit subtract 4 digit. At each stage, only make one exchange initially.	Continue to explore formal columnar written method and how to exchange in order to calculate. Begin with 3 digit subtract 3 digit; moving to 4 digit subtract 3 digit and then 4 digit subtract 4 digit. At each stage, only make one exchange initially. Begin to include 0 as a place holder: model how to exchange. 
Progress to subtraction of numbers with 2 decimal places in context £318.69 - £146.25 = £172.44 Estimate answers before calculation e.g. 318.69 – 146.25 = 320 – 150 = 170	Use pictorial representations as shown above where appropriate.	

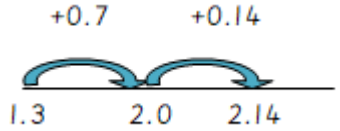
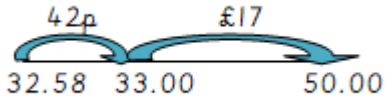
Year 5 Objectives:

- subtract whole numbers with more than 4 digits, including using formal written methods (columnar subtraction)
- subtract numbers mentally with increasingly large numbers
- use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- solve subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

Concrete	Pictorial	Abstract
Continue to build on Year 4 before subtracting with more than 4 digits, including numbers with differing decimal places e.g 134.25 – 23.4 =		Subtracting 5 digit numbers, moving towards 6 digit numbers and using 0 as a place holder. Discrete teaching of the requirement to make more than one exchanges must be taught, when dealing with 0.  Model how to use 0 as a place holder when calculating with numbers with different decimal places.  N.B. in years 5 and 6, we encourage the children away from the vocabulary 'we can't do it' when subtracting a larger number from a smaller number. You can, it just gives you a negative number so it we carry instead.

Year 6 Objectives:

- solve subtraction multi-step problems in contexts, deciding which operations and methods to use and why

Concrete	Pictorial	Abstract
Apply knowledge and understanding to the solving of different problems involving subtraction dealing with digits to 1,000,000. Subtract numbers with up to 3 decimal places, in context such as measure.		H T O . t h th 8 $\not{6}^{5}$ $\not{4}^{13}$. $\not{0}^{9}$ 14 6 - 5 3 6 . 8 7 3 3 2 7 . 1 7 3
	Use counting on to subtract smaller numbers with decimals. 2.14 – 1.3 = 0.84  Use counting on to subtract money from multiples of 10 e.g. £50. £50 – 32.58 = £17.42  	Solve problems in real contexts e.g. A car company needed to sell 345,234 cars in 3 months. In the first month they sold 122,408 and in the second month they sold 159,386 cars. How many did they need to sell in the third month? 345,234 – (122,408 + 159,386) =63,440