PROGRESSION IN CALCULATIONS

SUBTRACTION

KS1 Mental Skills

- Count back in ones and tens from any number
- Know number facts for numbers to 20
- Subtract multiples of 10 from any number
- Partition and recombine numbers (only partitioning the number to be subtracted)
- Bridge through 10

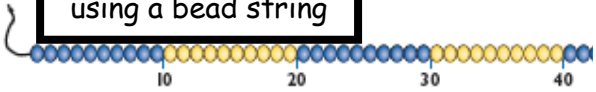
Vocabulary

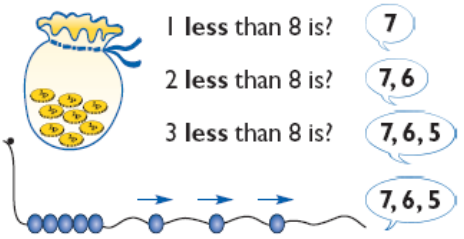
count back
take away
fewer
subtract
minus
less
difference between

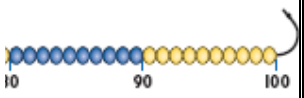
10, 9, 8, 7...

Continue the count back in ones from any given number

Count back in tens from any number using a bead string

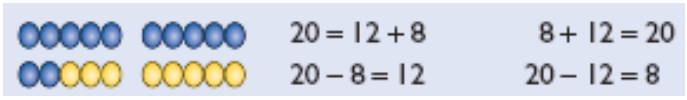






Find one less than a number

Know by heart subtraction facts for numbers up to 10 and 20

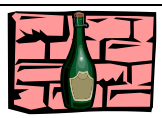
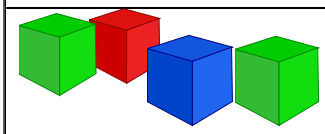
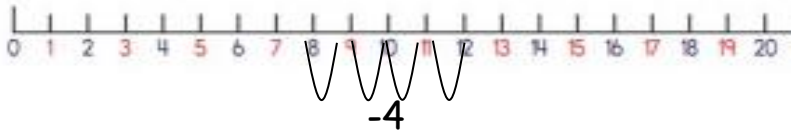
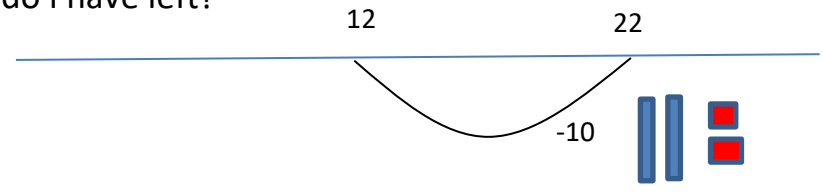


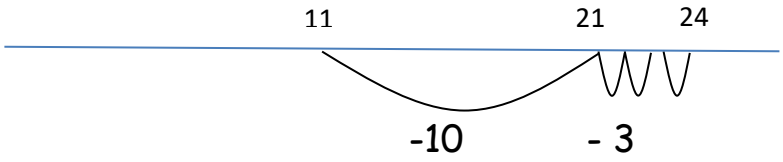
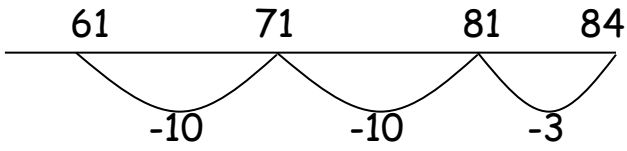
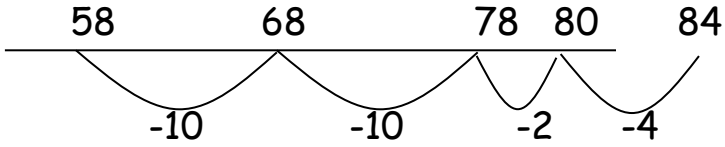
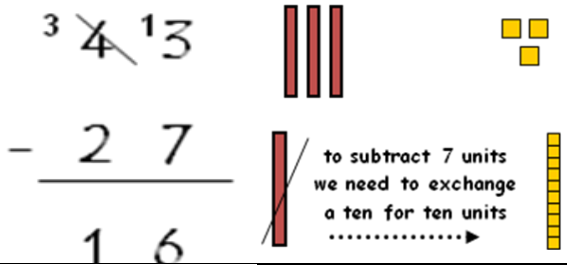
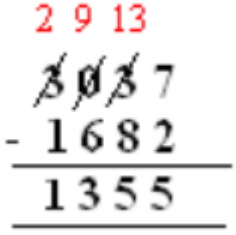
6 + ? = 10
10 – 6 = ?

? + 6 = 10
10 – 4 = 6

SUBTRACTION – taking away

Children are taught to understand subtraction as taking away (counting back).

<table>
<tr><td rowspan="3">Year R (ARE)</td><td>5 fat sausages sizzling in the pan....
 
 
10 green bottles hanging on the wall..</td><td>Children will count down from 20 in familiar contexts such as rhymes and stories.</td></tr>
<tr><td> 
One less than five is four
  </td><td>Children will practically find one less than any given number to 20.</td></tr>
<tr><td>I had 3 teddies and I gave one to my sister. How many did I have left?
  </td><td>Begin to relate subtraction to taking away. Using objects, drawing pictures and counting back.</td></tr>
<tr><td rowspan="2">Year 1 (ARE)</td><td>7 – 3 =
Mum baked 7 biscuits. I ate 3. How many were left?
  </td><td>The total number can be represented using dots which are then crossed out showing the take away.</td></tr>
<tr><td>12 – 4 =
Mum baked 12 biscuits. I ate 4. How many were left?
  </td><td>A numbered numberline is used to support numerical understanding. Count backwards from 12 along the number line, stopping after 4 jumps.</td></tr>
<tr><td>Year 2 (ARE)</td><td>22 - 10=
I have 22p and I buy a book for 10p. How much money do I have left?
  </td><td>As children become more confident with taking away ten from a number, they can begin to do this on a number line.</td></tr>
</table>

Year 2 (GD)	24 – 13 = There were 24 people on the bus. 13 people got off at the next stop. How many people were left on the bus?  	First a numbered numberline, then an unstructured numberline can also be used subtracting 2 digit numbers. The ones can be taken away in 1 step or individually, then the tens.
	84 – 23 = I cut 23cm off a ribbon measuring 84cm. How much is left?  	Children can use an unstructured number line to keep a record of the steps they have taken. Place value apparatus may be used alongside the number line.
Year 3 (ARE)	84 – 26 = I cut 26cm off a ribbon measuring 84cm. How much is left?  	Children use an unmarked number line, jumping back to the nearest ten, then taking the rest of the ones before taking away the tens.
	43 – 27 =  	Children use place value equipment to model exchanging as they learn to use formal column subtraction with up to three digits.
Year 4 (ARE)	 	Using their place value knowledge they will now be able to use the standard written method by the end of Year 4 to subtract with numbers up to 4 digits. Place value equipment will be used as needed to support understanding of exchange.

Year 5 & 6 (ARE)

274,897 - 45,996 =

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   6 3
 2 7 4 8 9 7
-  4 5 9 9 6
   2 2 8 9 0 1
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15.7 – 8.28 =

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 0 1   6 1
   1 5 . 7 0
-    8 . 2 8
     7 . 4 2
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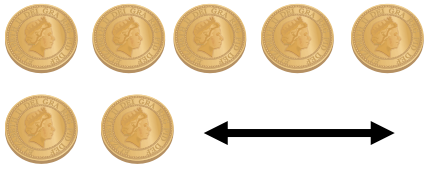
In Year 5 and 6 children will use the column method for subtraction, applying it to larger numbers and decimal numbers. It is critical that they use their place value knowledge to line up the digits accurately.

SUBTRACTION – finding the difference

Children are taught to understand subtraction as finding the difference (counting up).

Year 1 (ARE)

A teddy bear costs £5 and a doll costs £2. How much more does the bear cost?



Lining up the equipment for both numbers allows children to see the difference.

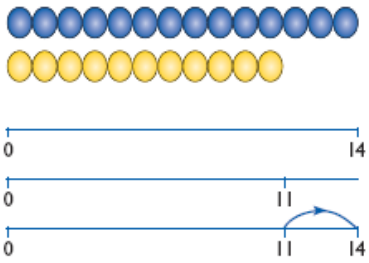
Find the difference between 2 and 5?

5 – 2 =

Numicon apparatus can be laid one top of each other to identify the difference between the two numbers. Children will be encouraged to record this calculation as a subtraction sentence.

Year 2 (ARE)

Find the difference between 11 and 14.



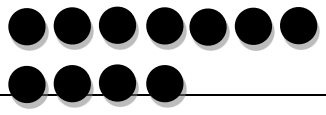
The difference between 11 and 14 is 3.

14 – 11 = 3

11 + □ = 14

Begin to find the difference by counting up from the smallest number.

Lisa has 7 felt tip pens and Tim has 4. How many more does Lisa have?



Lined up dots can be used to show how many they each have, making the difference clearer.

Mental Skills KS2

- Place Value: count back in tens, hundreds, thousands etc. *(appropriate to year group, both larger numbers and decimals)*
- Place value: 70 - 50 *(use knowledge of 7 - 5)*
- Partition: count back in tens and ones and recombine *(model on empty numberline, use larger numbers in higher year groups)*
- Partition: count back in hours or minutes bridging through 60 *(model on empty numberline)*
- Adjustment: 25 - 9 = 15 + 1, subtracting 10 and adjusting *(use larger numbers and decimals in higher year groups)*