Upper Key Stage 2

SUBTRACTION

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Developing Conceptual Understanding:
CONTEXTUAL – LINGUISTIC - PRACTICAL – CONCRETE

Continue to reinforce the strategies outlined in the LKS2 section, to support subtraction in different contexts such as decimals, money etc

Upper Key Stage 2

SUBTRACTION

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Developing Conceptual Understanding:
PICTORIAL – MENTAL

Practise and refine the use of counting on (number line strategy) as a mental method – it is much easier to count on than back (or do column method) when working out differences or subtractions without pencil and paper.

Number line strategy should be kept as the default mental strategy – and is often quicker for one mark SATs Arithmetic Paper questions – as it is invaluable for working in UKS2 contexts such as negative number and time.
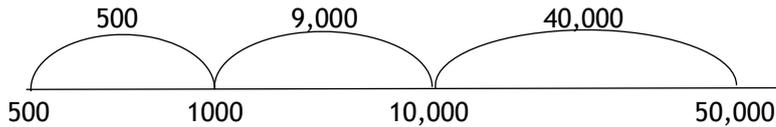
Upper Key Stage 2

SUBTRACTION
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Abstract Recording:
INFORMAL JOTTINGS
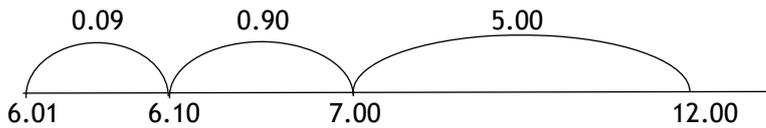
- ## Number line Strategy:

Eg; 50,000 – 500

$$\begin{array}{r} 40000 \\ +\ \ 9500 \\ \hline 49500 \end{array}$$

- ## Subtracting decimal numbers:

Eg; 12 – 6.01

'Counting on'

$$\begin{array}{r} 5\bullet00 \\ +\ \ 0\bullet99 \\ \hline 5\bullet99 \end{array}$$
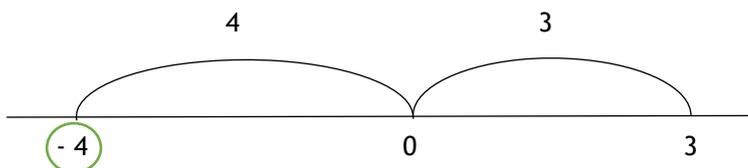
OR 'Counting back'

- ## Subtracting negative numbers:

E.g.;   3 – 7   'The temperature was 3°C. Overnight, it dropped by 7°. What is the new temperature?'

Draw an open number line and place the first number in the question on the right. Now count back to zero. Use number bond knowledge to count back what's left of the number we are subtracting until you reach the answer.

Note that this strategy builds on KS1 knowledge of number bonds, and the number line strategies of counting <u>back</u> and 'moving to the nearest 10'.

- Also use vertical number lines to consolidate understanding of negative numbers and links to reading thermometers
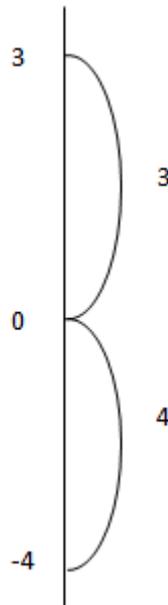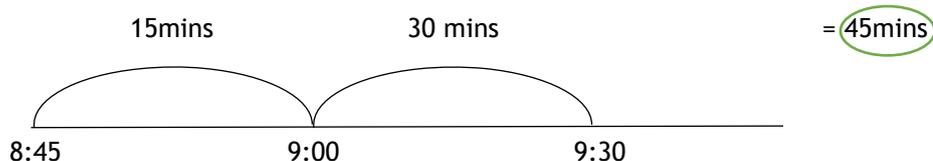

- <u>Number lines for Time:</u>

  Because time is not in base 10 (60 mins in an hour etc), children have to know that they <u>cannot use column methods</u> when calculating with it.

  Depending on the nature of the question, we need to use one of the three forms of Number line to calculate time questions correctly:

1) Closed number lines for 'elapsed time':

   Eg; I leave home at 8:45 and arrive at 9:30. How long does my journey take?

   15mins   30 mins   = 45mins

   8:45   9:00   9:30

   Draw the number line – it is 'closed' because we can put both start and finish time at either end of the line. Start from the start time, count on to the next hour, see how much more is needed to get to the finish time and add that on. The answer is the total of the jumps.

2) Open number lines for additional time:

   Eg; A television programme starts at 10:25 and lasts for 48 minutes. What time will it finish?

   35mins   13mins   35 + 13 = 48 mins
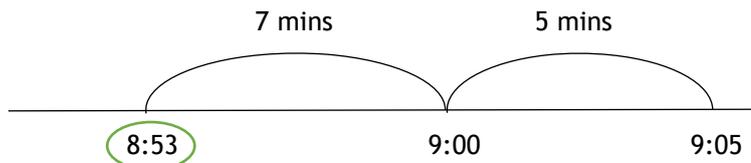
10:25   11:00   (11:13)

Draw the number line and the only time given (hence the number line is <u>open</u>-ended). Count on to the next hour, work out how much more time needs to be counted on and jump on that amount. You will land on the answer.

3) Counting back on an open number line:

E.g.; Stefan's watch shows 9:05. His watch is 12 minutes fast. What is the correct time?

```
           7 mins              5 mins

      ⌒‾‾‾‾‾‾⌒      ⌒‾‾‾‾‾⌒
_____/_____/_____
      (8:53)              9:00              9:05
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Start by drawing the open number line with the only time given. The watch is fast so we have to count back – go back to the nearest hour and adjust to count back the remaining time. You will land on the answer.

Upper Key Stage 2

SUBTRACTION

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Abstract Recording:
STANDARD WRITTEN METHOD

- Column Subtraction:

Decimal column subtraction:

E.g.;   48.42 – 37.61

$$\begin{array}{r} ^7\\ 4\!\!\!/\ 8\cdot{}^1 4\ 2 \\ -\ 3\ 7\cdot 6\ 1 \\ \hline 1\ 0\cdot 8\ 1 \end{array}$$

E.g.;   1.125kg – 785g

Units aren't the same, so convert (usually the smaller) one – eg 785g = 0.785kg

$$\begin{array}{r} 0\ \ ^1 0\\ 1\!\!\!/\cdot 1\!\!\!/\ {}^1 2\ 5 \\ -\ 0\cdot 7\ 8\ 5 \\ \hline 0\cdot 3\ 4\ 0\ \ kg \end{array}$$ or 340 g

With different numbers of place value columns in decimal numbers, use 0 as a place holder:

E.g.; 15.4 – 8.88

$$\begin{array}{r} 0\ \ ^1 4\ \ ^1 3\\ 1\!\!\!/\ 5\!\!\!/\cdot 4\!\!\!/\ {}^1 0 \\ -\ 8\cdot 8\ 8 \\ \hline 0\ 6\cdot 5\ 2 \end{array}$$

The 0 has been added as a place holder to reduce confusion prior to subtracting in the hundredths column.