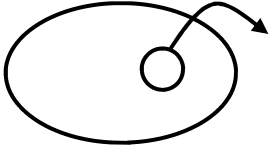

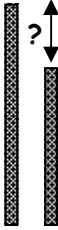
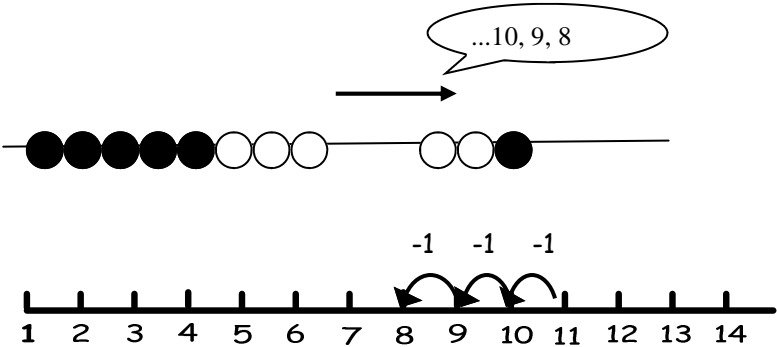
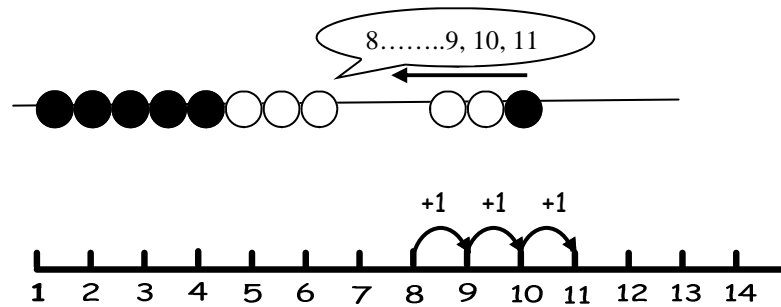


Stage	Progression for Subtraction
1	<p>PRE-UNDERSTANDING/PRACTICAL EXPERIENCES</p> <ul style="list-style-type: none"> Use developing mathematical ideas and methods to solve practical problems involving counting and comparing in a real or role play context. <p>DEVELOPING UNDERSTANDING</p> <ul style="list-style-type: none"> Understand subtraction as 'taking away.....'  <p>...and 'finding the difference (note the shorter bar is always more than half the longer bar)</p>  <p style="text-align: center;">and</p>  <ul style="list-style-type: none"> Interpret situations as subtraction calculations and explain reasoning. For example, answer questions such as: <i>There are 18 bean bags. Kim takes 5. How many bean bags are left?</i> <i>There are 9 people on a bus and 5 people in a car. How many more people are there on the bus than in the car?</i> <p>Derive and recall subtraction facts - See appendices for yearly expectations and possible models and images to aid this learning. NB: Children should develop and use a 'toolbox' of mental calculation strategies from which they can choose the most efficient strategy to solve a calculation depending on the numbers involved in it.</p> <p>GENERAL STRATEGIES Developing mental calculation practically first and then with jottings</p>
2	<p><u>Taking away</u></p> <p>11 - 3</p> 

- Finding a difference by counting up (when numbers are relatively close together)

$11-8$



Partitioning:

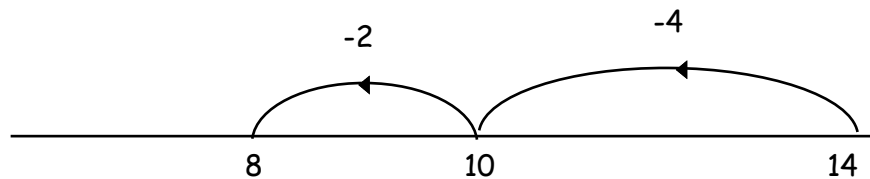
Consider where children are at in relation to their use of marked, partially marked or blank number lines to determine their use with the models below.

Use counting and developing recall of number facts to subtract a pair of numbers mentally by...

- Partitioning numbers to enable bridging through 10....

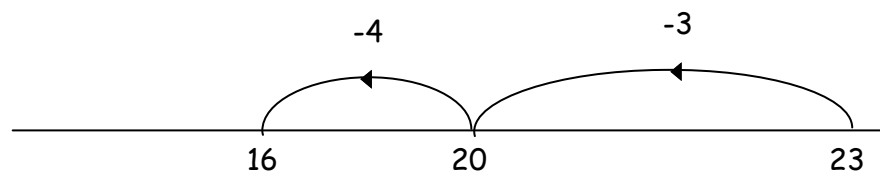
$14-6$

2



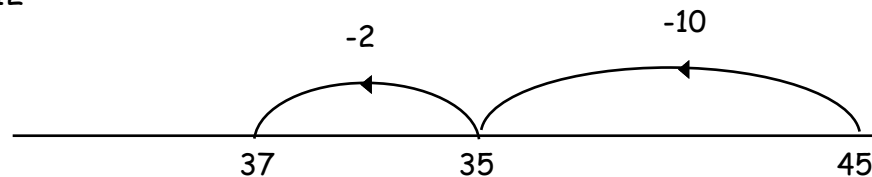
... progressing to bridging through other multiples of 10

$23-7$



- Partitioning two digit numbers into their component parts

$45-12$



And/
or

$$45-12 = 45-10-2$$

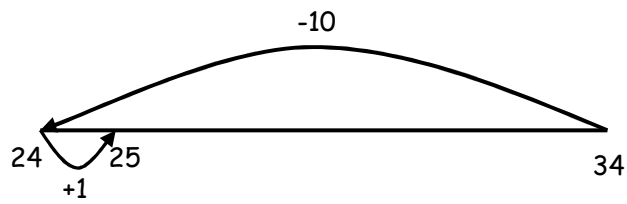
$$= 35-2$$

$$= 33$$

SPECIAL CASE STRATEGIES

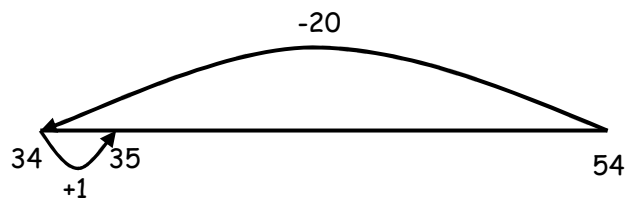
- **Rounding and adjusting** (subtracting nearest multiple of 10, 100 etc and adjusting) Could also be modelled on a bead bar.

$$34 - 9$$

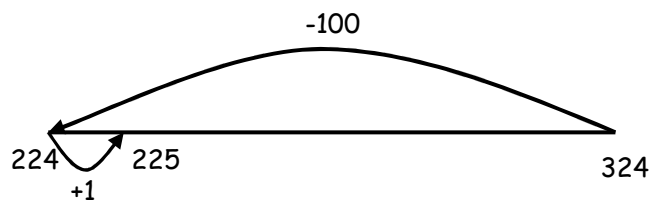


Progression through this strategy occurs through the number involved

$$54 - 19$$

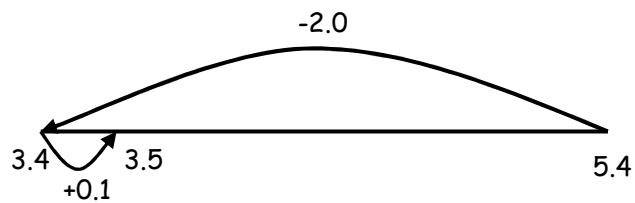


$$324 - 99$$



This method can be extended to 4 and 5 digit numbers and decimals

$$5.4 - 1.9$$



WRITTEN METHODS:

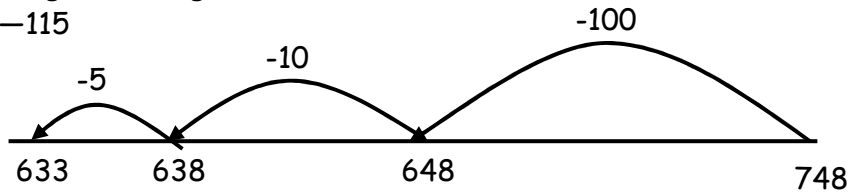
Children should be encouraged to select an appropriate calculation method, be it mental or written, depending on the numbers involved in the calculation. To develop this skill children should be taught to ask themselves 'Can I do this mentally?' Therefore, it is important that children's mental methods of calculation are practised and secured alongside their learning and development towards a compact written method.

USING THE NUMBER LINE AS A WRITTEN METHOD FOR LARGER

NUMBERS. Counting back or counting on dependent upon numbers involved. For example:

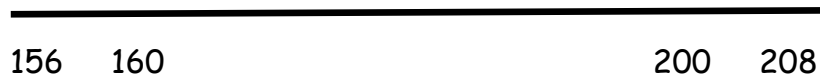
Counting back (larger difference)

748-115



Counting on (smaller difference)

208-156 +4 +40 +8



INFORMAL EXPANDED METHOD:

This leads children to the more compact written method developing an understanding of its structure and efficiency. Two and three digit subtraction:

Start with subtracting the units, then the tens etc

3

No adjustment

$$\begin{array}{r}
 800 \quad 60 \quad 4 \\
 - 600 \quad 20 \quad 1 \\
 \hline
 200 \quad 40 \quad 3
 \end{array}$$

One adjustment

Encourage children to practise the skill of partitioning numbers in different ways e. g.

$$\begin{aligned}
 437 &= 300 + 130 + 7 \\
 &= 300 + 120 + 17 \\
 &= 300 + 110 + 27
 \end{aligned}$$

Tens to ones: 151 - 36 (Discuss how the 51 could be partitioned into 40 and 11)

$$\begin{array}{r}
 100 \quad 50 \quad 1 \\
 - \quad \quad 30 \quad 6 \\
 \hline
 \end{array}
 \rightarrow
 \begin{array}{r}
 \text{Intermediate stage if} \\
 \text{required} \\
 100 \quad 40 \quad 11 \\
 - \quad \quad 30 \quad 6 \\
 \hline
 100 \quad 10 \quad 5
 \end{array}
 \rightarrow
 \begin{array}{r}
 \quad \quad 40 \quad 11 \\
 100 \quad \cancel{50} \quad \cancel{1} \\
 - \quad \quad 30 \quad 6 \\
 \hline
 100 \quad 10 \quad 5
 \end{array}$$

...hundreds to tens 412 - 271

Intermediate stage if required

$$\begin{array}{r}
 400 \quad 10 \quad 2 \\
 - 200 \quad 70 \quad 1 \\
 \hline
 \end{array}
 \rightarrow
 \begin{array}{r}
 300 \quad 110 \quad 2 \\
 - 200 \quad 70 \quad 1 \\
 \hline
 100 \quad 40 \quad 1
 \end{array}
 \rightarrow
 \begin{array}{r}
 \cancel{300} \quad \cancel{110} \quad 2 \\
 - 200 \quad 70 \quad 1 \\
 \hline
 100 \quad 40 \quad 1
 \end{array}$$

3

Two adjustments

$$\begin{array}{r}
 643 - 385 \quad 500 \quad 130 \\
 \quad \quad \quad \cancel{30} \quad 13 \\
 \quad \quad \quad \cancel{600} \quad \cancel{40} \quad \cancel{3} \\
 - 300 \quad 80 \quad 5 \\
 \hline
 200 \quad 50 \quad 8
 \end{array}$$

COMPACT METHOD:

NB: For some children the number line will still be the most efficient and reliable calculation method.

The method doesn't change but the recording is reduced. Only children who can calculate independently and efficiently with the expanded method should be introduced to the compact method. For some children the number line will be the most efficient and accurate recording method.

No adjustment

$$\begin{array}{r}
 247 \\
 - 23 \\
 \hline
 224
 \end{array}$$

$$\begin{array}{r}
 864 \\
 - 621 \\
 \hline
 243
 \end{array}$$

4

One adjustment, tens to units

$$\begin{array}{r}
 \\
 2 \cancel{5} \cancel{1} \quad (200 + 40 + 11) \\
 - 36 \\
 \hline
 215
 \end{array}$$

$$\begin{array}{r}
 \\
 4 \cancel{2} \cancel{2} \quad (400 + 20 + 12) \\
 - 217 \\
 \hline
 215
 \end{array}$$

One adjustment, hundreds to tens

$$\begin{array}{r}
 \\
 \cancel{3} \cancel{7} \quad (300 + 130 + 7) \\
 - 182 \\
 \hline
 255
 \end{array}$$

Two adjustments, tens to units then hundreds to tens,

$$\begin{array}{r} \cancel{3} \cancel{12} \cancel{12} \\ \cancel{4} \cancel{3} \cancel{2} \\ - 187 \\ \hline 245 \end{array} \quad (300 + 120 + 12)$$

Dealing with zeroes,

$$\begin{array}{r} \cancel{4} \cancel{9} \cancel{13} \\ \cancel{5} \cancel{0} \cancel{3} \\ - 278 \\ \hline 225 \end{array}$$

- Extend use of method to subtract sums of money or measures, with or without adjustments, and the same number of decimal places.

$$\begin{array}{r} \cancel{1} \cancel{13} \cancel{12} \\ \cancel{2} \cancel{4} \cancel{2} \\ - 8.71 \\ \hline 15.53 \end{array}$$

4

NB: For children displaying a lack of understanding of recording at Stage 4, return to the expanded method of recording at Stage 3.

- Extend method to numbers with at least four digits.

$$\begin{array}{r} 1587 \\ - 475 \\ \hline 1112 \end{array}$$

$$\begin{array}{r} 3582 \\ - 1675 \\ \hline 1907 \end{array}$$

- Use the compact method extending to numbers with any number of digits.
- Use the compact method to subtract decimal fractions with up to 4 digits and either 1 or 2 decimal places.