Calculation Guidelines for Gifted and Talented Children Working Beyond Primary Level

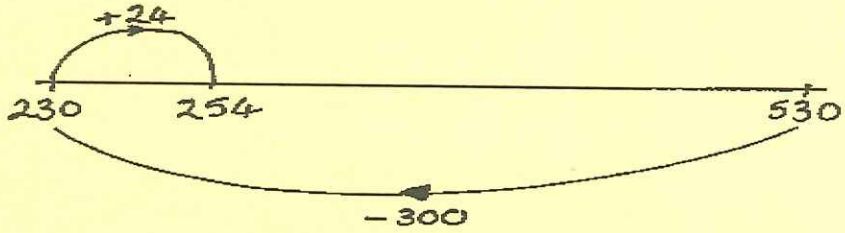
SUBTRACTION

Mental methods

Use compensation by subtracting too much, and then compensating

Use jottings such as an empty number line to support or explain methods for adding mentally.

$$530 - 276 = 530 - 300 + 24$$
$$= 230 + 24$$
$$= 254$$



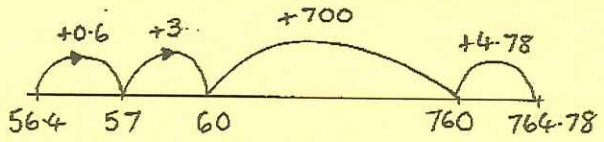
Pencil and paper procedures (Written methods)

Extend to decimals with up to 2 decimal places, including:

- differences with different numbers of digits
- totals of more than two numbers.

Complementary addition

$764.78 - 56.4 = 708.38$



Subtract more complicated fractions
For Example:

Know that fractions can be added/subtracted if they have the same denominator.

$\frac{5}{6} - \frac{3}{4}$

$\frac{10 - 9}{12} = \frac{1}{12}$

SUBTRACTION GUIDELINES

Year One

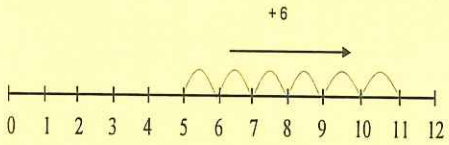
- = signs and missing numbers

7 - 3 = □ □ = 7 - 3
7 - □ = 4 4 = □ - 3
□ - 3 = 4 4 = 7 - □
□ - ∇ = 4 4 = □ - ∇

- Understand subtraction as 'take away'

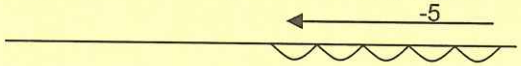
- Find a 'difference' by counting up;

I have saved 5p. The socks that I want to buy cost 11p. How much more do I need in order to buy the socks?



- Use practical and informal written methods to support the subtraction of a one-digit number from a one digit or two-digit number and a multiple of 10 from a two-digit number.

I have 11 toy cars. There are 5 cars too many to fit in the garage. How many cars fit in the garage?



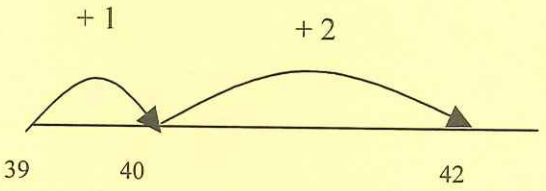
Use the vocabulary related to addition and subtraction and symbols to describe and record addition and subtraction number sentences
Recording by
- drawing jumps on prepared lines
- constructing own lines

Year Two

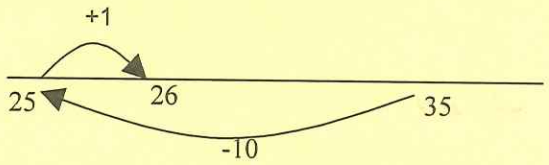
- = signs and missing numbers

Continue using a range of equations as in Year 1 but with appropriate numbers.
Extend to 14 + 5 = 20 - □

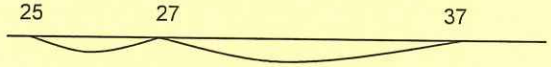
Find a small difference by counting up
42 – 39 = 3



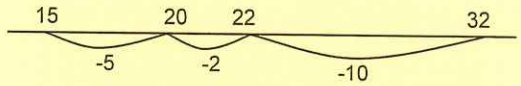
Subtract 9 or 11. Begin to add/subtract 19 or 21
35 – 9 = 26



Use known number facts and place value to subtract
(partition second number only)
37 – 12 = 37 – 10 – 2
= 27 – 2
= 25



Bridge through 10 where necessary
32 - 17



Year Three

- = signs and missing numbers

Continue using a range of equations as in Year 1 and 2 but with appropriate numbers.

Find a small difference by counting up

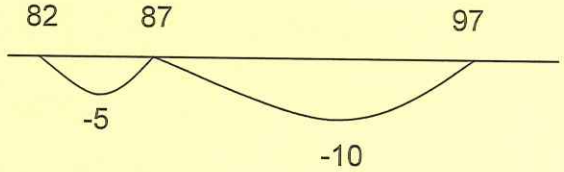
Continue as in Year 2 but with appropriate numbers e.g. 102 – 97 = 5

Subtract mentally a 'near multiple of 10' to or from a two-digit number

Continue as in Year 2 but with appropriate numbers e.g. 78 – 49 is the same as 78 – 50 + 1

Use known number facts and place value to subtract

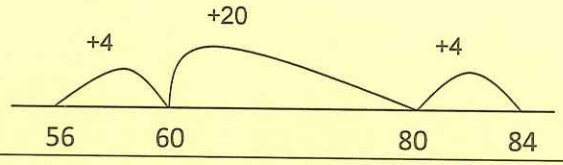
Continue as in Year 2 but with appropriate numbers e.g.**97 – 15 = 72**



With practice, children will need to record less information and decide whether to count back or forward. It is useful to ask children whether counting up or back is the more efficient for calculations such as 57 – 12, 86 – 77 or 43 – 28.

Pencil and paper procedures

Complementary addition
84 – 56 = 28



SUBTRACTION GUIDELINES

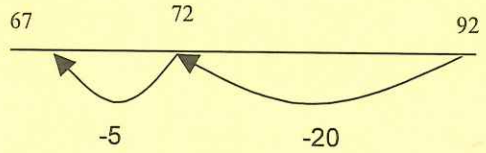
(- = signs and missing numbers: Continue using a range of equations as in Year 1 and 2 but with appropriate numbers.)

Year Four

Find a small difference by counting up
e.g. 5003 – 4996 = 7
This can be modelled on an empty number line (see complementary addition below). Children should be encouraged to use known number facts to reduce the number of steps.

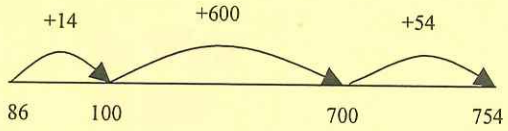
Subtract the nearest multiple of 10, then adjust.
Continue as in Year 2 and 3 but with appropriate numbers.

Use known number facts and place value to subtract
92 – 25 = 67



Pencil and paper procedures

Complementary addition
754 – 86 = 668



For those children with a secure mental image of the number line they could record the jumps only:

754 – 86 = 668

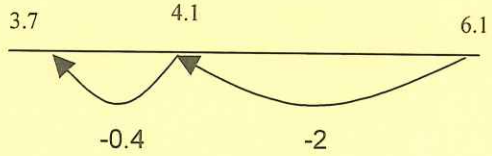
14 (100)
600 (700)
54 (754)
668

Year Five

Find a difference by counting up
e.g. 8006 – 2993 = 5013
This can be modelled on an empty number line (see complementary addition below).

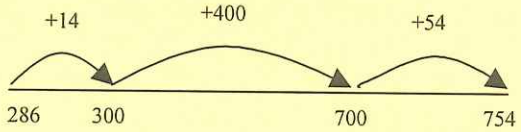
Subtract the nearest multiple of 10 or 100, then adjust.
Continue as in Year 2, 3 and 4 but with appropriate numbers.

Use known number facts and place value to subtract
6.1 – 2.4 = 3.7



Pencil and paper procedures

Complementary addition
754 – 286 = 468



OR
754 - 286 = 468

14 (300)	can be refined to	14 (300)
400 (700)		454 (754)
54 (754)		468
468		

Reduce the number of steps to make the calculation more efficient.
Extend to 2 places of decimals

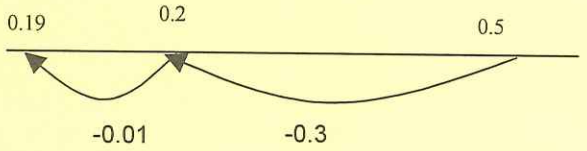
Year Six

Find a difference by counting up
e.g. 8000 – 2785 = 5215
To make this method more efficient, the number of steps should be reduced to a minimum through children knowing:

- Complements to 1, involving decimals to two decimal places (0.16 + 0.84)
- Complements to 10, 100 and 100

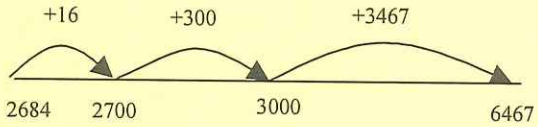
Subtract the nearest multiple of 10, 100 or 1000, then adjust
Continue as in Year 2, 3, 4 and 5 but with appropriate numbers.
Use known number facts and place value to subtract

0.5 – 0.31 = 0.19



Pencil and paper procedures

Complementary addition
6467 – 2684 = 3783



OR
6467 – 2684 = 3783

16 (2700)	can be refined to	316 (3000)
300 (3000)		3467 (6467)
3467 (6467)		3783
3783		

Reduce the number of steps to make the calculation more efficient.
Extend to 2 places of decimals