

Progression in Addition

Stage 1

Use concrete objects and pictorial representations to solve simple addition problems counting all. Introduce counting on using a number track putting the largest number first.

Stage 2

Continue to use practical resources to *support* calculation. Introduce and *model* the use of the number-line. Children begin to use numbered lines to support their own calculations.

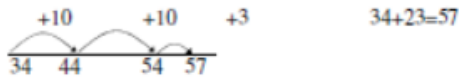
Bead strings or bead bars can be used to illustrate addition including bridging through ten by counting on 2 then counting on 3 when doing $8+5$.



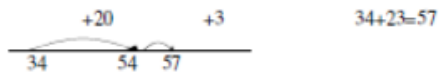
Stage 3

Children will begin to use 'empty number lines' themselves starting with the larger number and counting on irrespective of the order of calculation.

First counting on in tens and ones then helping children to become more efficient by adding the units in one jump (e.g. by using the known fact $4 + 3 = 7$).



Followed by adding the tens in one jump and the units in one jump.



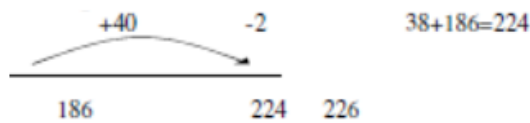
Children should use their understanding of addition to begin to add fractions with the same denominator.

$$\frac{2}{4} + \frac{2}{4} = \frac{4}{4}$$

Stage 4

Children will continue to use empty number lines with increasingly large numbers, including compensation where appropriate.

Compensation



ALWAYS COUNT FORWARDS ON A NUMBER-LINE WHEN ADDING SO THE CHILDREN DO NOT GET CONFUSED.

COUNT ON = ADDITION

Children will **begin** to use informal pencil and paper methods (jottings) to support, record and explain mental methods building on existing strategies.

E.g. Partitioning – record mental methods using partitioning.

$$47 + 76 = 76 + 40 + 7 = 116 + 7 = 123$$

Leading to:

$$70 + 6$$

$$\underline{40 + 7}$$

$$110 + 13 = 123$$

Progression in Subtraction

Stage 1

Use concrete objects and pictorial representations to solve simple subtraction problems, involving:-

- **'taking away'** finding how many are left when some are removed
- **'finding the difference'** by using practical objects/resources (e.g. beadstrings, cube towers or number tracks) to make a comparison between the numbers
- **'part/whole' situations** finding how many in a set fit a criteria e.g. 5 cars, 3 are red and the rest are blue. How many are blue?

Stage 2

Continue to use practical resources to *support* calculation. Introduce and *model* the use of the number-line. Children begin to use numbered lines to support their own calculations.

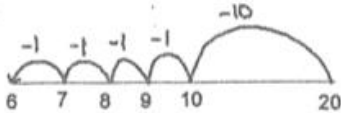
ALWAYS COUNT BACK ON A NUMBER-LINE WHEN SUBTRACTING SO THE CHILDREN DO NOT GET CONFUSED.

COUNT BACK = SUBTRACTION

➤ Taking Away

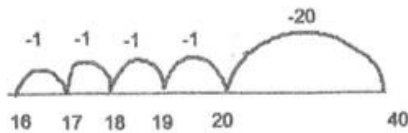
1st) **COUNTING BACK** in tens and ones.

$$20 - 14 = 6$$



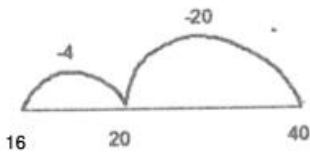
2nd) **COUNTING BACK** tens in one jump and units/ones in ones.

$$40 - 24 = 16$$



3rd) **COUNTING BACK** tens in one jump and units/ones in one jump.

$$40 - 24 = 16$$



Stage 3

Children will continue to use structured number lines leading to empty number lines.

Partitioning and decomposition

Initially, the children will be taught using examples that do not need the children to regroup.

$$\begin{array}{r} 89 \\ -57 \\ \hline \end{array} = \begin{array}{r} 80 + 9 \\ 50 + 7 \\ \hline 30 + 2 \end{array} = 32$$

Progression in Multiplication

Stage 1

Children will use concrete objects, pictorial representations and arrays in context, with the support of the teacher, to work on practical problem solving activities involving equal sets or groups. They will begin to make connections between different representations and to count in twos, fives and tens and extend to other patterns.

Stage 2

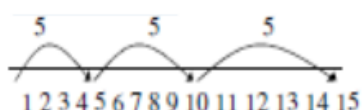
Children will begin to develop their recording using pictures and written descriptions and continue to use a wide range of representations including repeated addition, commutativity, arrays and scaling.

➤ Repeated addition

3 times 5 is $5 + 5 + 5 = 15$ or 3 lots of 5 or 5×3

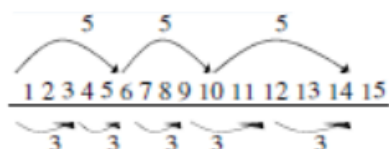
Repeated addition can be shown easily on a number line:

$$5 \times 3 = 5 + 5 + 5$$



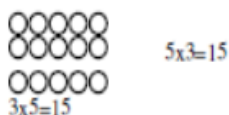
➤ Commutativity

Children should know that 3×5 has the same answer as 5×3 . This can also be shown on the number line.



➤ Arrays

Children should be able to model a multiplication calculation using an array.



➤ Scaling

Children will develop an understanding of scaling and comparative language e.g. twice as high, half as long, linked to doubling and halving.

Progression in Division

Stage 1

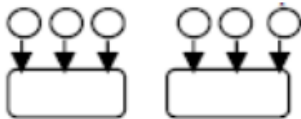
Children will use concrete objects, pictorial representations and arrays in context, with the support of the teacher, to work on practical problem solving activities involving equal sets or groups. Children will begin to find simple fractions of objects, numbers and quantities.

Stage 2

Children will begin to develop their recording using pictures and written descriptions and continue to use a wide range of representations including:

➤ **Sharing equally:**

6 sweets shared between 2 people, how many do they each get?

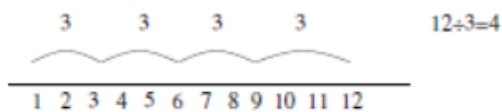


➤ **Grouping or arrays:**

There are 6 sweets. How many people can have 2 sweets each?



➤ **Counting on or back using a number line or bead bar:**



Link fractions to division and find simple fractions ($\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$) of a length, shape, set of objects or quantity.

Stage 3

Use arrays and link to counting on or back using a number line

Children will use an empty number line to support their calculation.

