

Progression in Subtraction

Vocabulary:

Taking away: finding how many are left when some are removed

Finding the difference: to make a comparison between the numbers

Finding complements: finding how many in a set fit a criteria. Eg. There are 12 children. 7 of them are boys. How many are girls?

Stage 1:

Use concrete objects and pictorial representations to solve simple subtraction problems involving 'taking away', 'finding the difference' (use bead strings, cube towers and number tracks), 'finding complements'.

Example:

$$7 - 2 =$$

Children to 'build' the problem by having 7 cubes and then taking 2 away.

Stage 2:

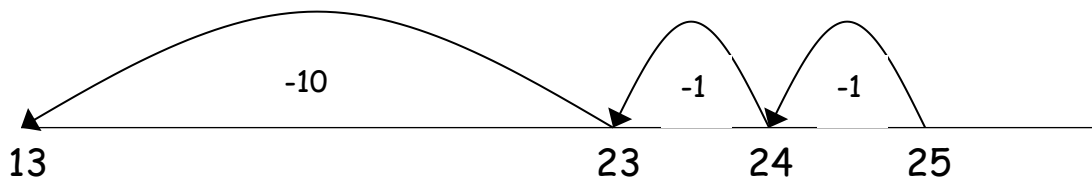
Continue to use practical resources to support calculation. Introduce and model the use of the number line. Children begin to use numbered lines to support their own calculations.

Taking away:

First, children begin by counting back in tens and ones:

Example:

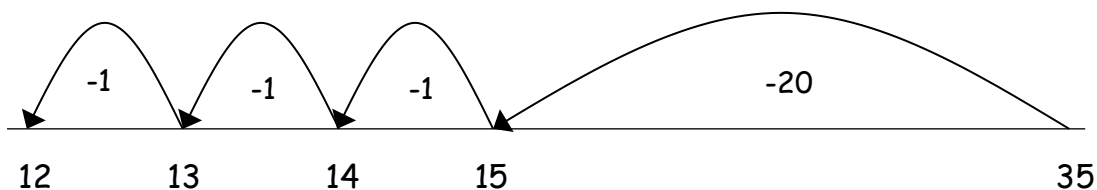
$$25 - 12 = 13$$



Second, this is developed by counting back tens in one jump and units in ones:

Example:

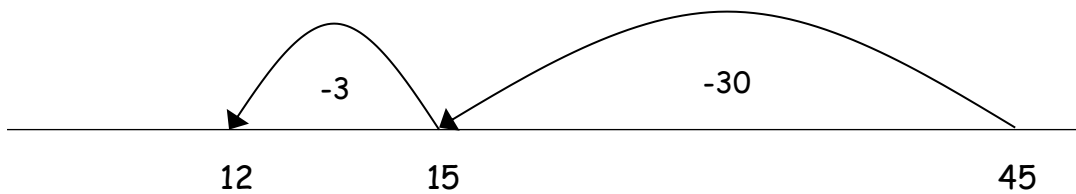
$$35 - 23 = 12$$



Third, this then develops on to counting back tens in one jump and units in one jump.

Example:

$$45 - 33$$



Finding the difference:

Counting on to be used when numbers are close together.

Stage 3:

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

Stage 4:

Children will continue to use empty number lines with increasingly large numbers and will begin to use informal pencil and paper methods (jottings) to support, record and explain mental methods building on existing strategies.

Partitioning and decomposition:

Initially, the children are taught examples where they do not need to regroup.

Example:

$$89 - 57 =$$

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

At this point children will play place value games to help them understanding regrouping. From this children will then regroup:

$$\begin{array}{r} 60 \quad 1 \\ \cancel{70} \quad 1 \\ - 40 \quad 6 \\ \hline 20 \quad 5 \end{array} = 25$$

Children should demonstrate their place value knowledge lining ones up under ones, tens up under tens etc.

They should continue to use an empty number line where the numbers are close together or near to multiples of 10, 100 etc. to count on. A number line can also be used for subtracting decimals.

Stage 5:

Children should be secure in a method for subtraction. Some children may continue confidently working in subtraction on a number line.

Partitioning and decomposition

Children will then solve problems that involve 'regrouping' more than one number.

Example:

$$\begin{array}{r} 600 \quad 140 \quad 1 \\ \cancel{700} \quad 50 \quad \cancel{4} \\ - \quad \quad 80 \quad 6 \\ \hline 600 \quad 60 \quad 8 = 668 \end{array}$$

This will then be developed on to using the formal column subtraction method including decomposition.

Example:

932 – 457 becomes

$$\begin{array}{r} 8 \quad 12 \quad 1 \\ \cancel{9} \quad \cancel{3} \quad 2 \\ - \quad 4 \quad 5 \quad 7 \\ \hline \quad 4 \quad 7 \quad 5 \\ \hline \end{array}$$

Answer: 475

Stage 6:

Children should extend the decomposition method to numbers with any number of digits, including decimals in a range of contexts, for example, money and measurement. Number lines and mental methods should also be used, if more efficient than decomposition.

Children should use their understanding of subtraction to subtract fractions with the same denominator and fractions with denominators of the same number.

Example:

$$\frac{4}{5} - \frac{2}{5} = \frac{2}{5} \qquad \frac{2}{3} - \frac{1}{2} = \frac{4}{6} - \frac{3}{6} = \frac{1}{6}$$

Stage 7:

Children should extend the re-grouping method to numbers with any number of digits, including decimals and apply their understanding of subtraction and equivalent fractions to subtract fractions with different denominators and mixed numbers:

Example:

$$\frac{1}{2} - \frac{1}{8} = \frac{3}{8}$$