

Progression In Division

Vocabulary:

Sharing: e.g. 6 sweets shared between 2 people, how many do they each get?

Grouping: e.g. There are 6 sweets. How many people can have 2 sweets each?

Stage 1:

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

Stage 2:

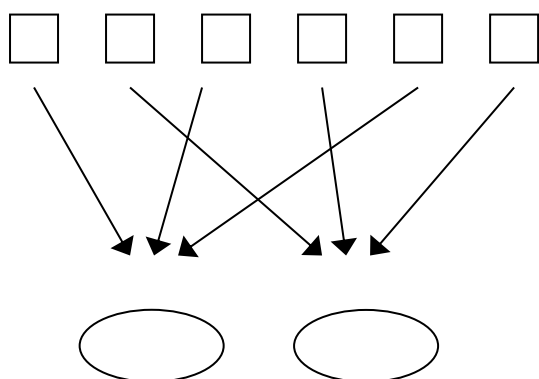
Children will begin to develop their recording using pictures and written description and continue to use a wide range of representations including:

Sharing equally:

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

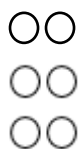
$$6 \div 2 = 3$$

Example:



Grouping or arrays:

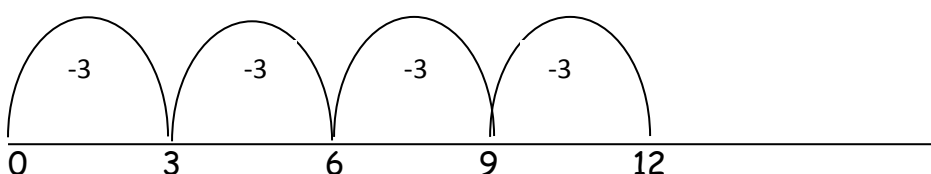
Example: There are 6 sweets. How many people can have 2 sweets each?



Repeated Subtraction: (using a number line or bead string)

Example: 12 divided by 3 is how many groups of 3 in 12?

$$12 \div 3 = 4$$

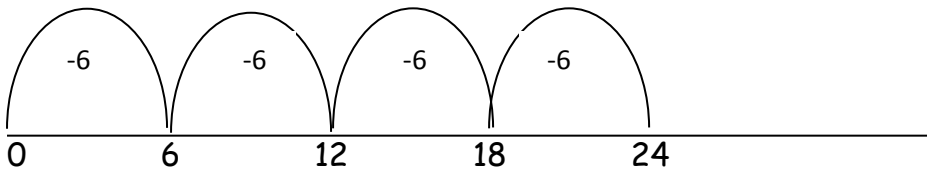


Stage 3:

Using arrays and link to counting on or back using a number line.
Children will use an empty number line to support their calculation.

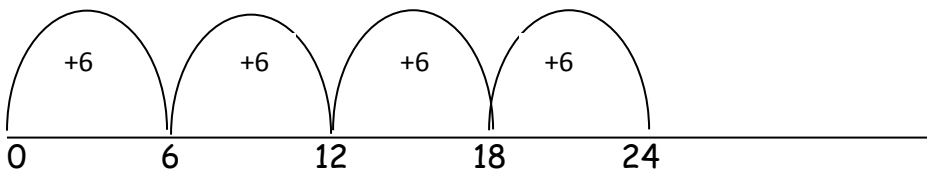
Counting back:

$$24 \div 6 = 4$$



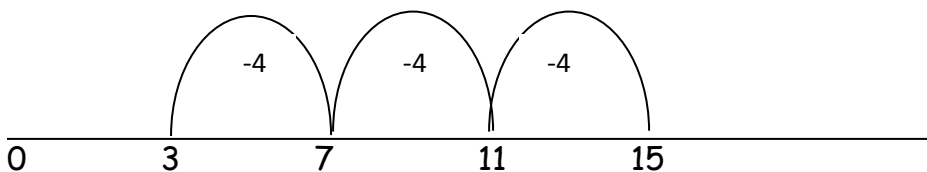
Counting on:

$$24 \div 6 = 4$$



Children should also move onto calculations involving remainders:

$$15 \div 4 = 4r3$$



Begin to use division to find unit and non-unit fractions of quantities, understand the effect of dividing a whole number by 10 or 100.

Stage 4:

Children will develop their use of the number line to add or subtract multiples of the divisor for calculations with or without a remainder.

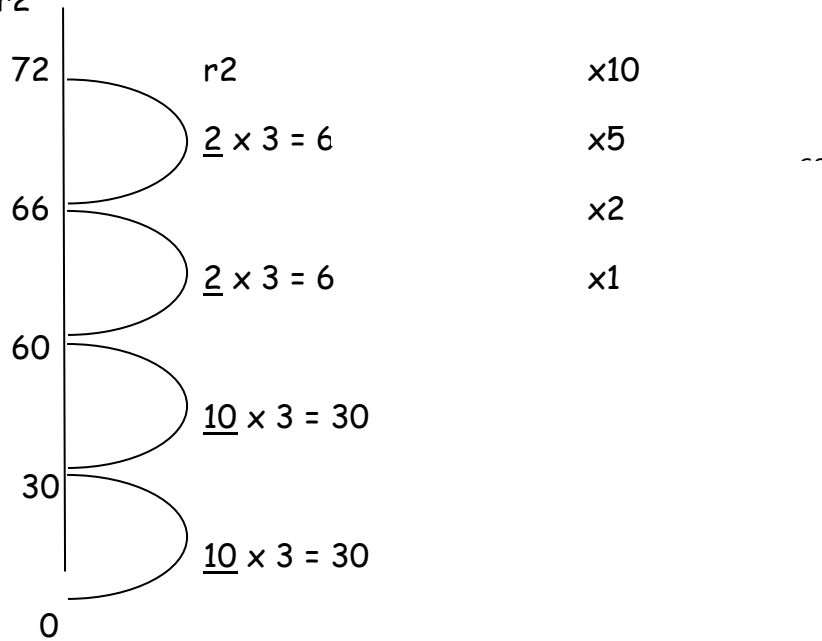
Chunking on a number line:

For this we will turn the number line vertically so that we have more space for calculations.

The children begin by identifying the times tables they find the easiest. They will then have these displayed to 'chunk' with (e.g. $\times 10$, $\times 5$, $\times 2$, $\times 1$ etc.).

Example:

$$74 \div 3 = 24 \text{ r}2$$



Any remainders should be shown as integers, i.e. 24 remainder 2 or 24 r2.

Children need to be able to decide what to do after division for word problems and round up or down if necessary according to the context of the division.

Stage 5:

Children will develop their understanding of division to use short division for numbers up to THTU÷U, interpreting remainders for the context.

Short Division:

Example:

98 ÷ 7 becomes

$$\begin{array}{r} 14 \\ 7 \overline{) 98} \\ \underline{7} \\ 28 \\ \underline{28} \\ 0 \end{array}$$

Answer: 14

432 ÷ 5 becomes

$$\begin{array}{r} 86 \text{ r } 2 \\ 5 \overline{) 432} \\ \underline{40} \\ 32 \\ \underline{30} \\ 2 \end{array}$$

Answer: 86 remainder 2

496 ÷ 11 becomes

$$\begin{array}{r} 45 \text{ r } 1 \\ 11 \overline{) 496} \\ \underline{44} \\ 56 \\ \underline{55} \\ 1 \end{array}$$

Answer: $45\frac{1}{11}$

Stage 6:

Children will use their knowledge and understanding of division to use a formal written method to divide numbers up to 4 digits by a 2 digit number. Any remainders should be shown as fractions, i.e. if the children were dividing 32 by 10, the answer should be shown as $3\frac{2}{10}$ which could be written as $3\frac{1}{5}$ in its lowest terms. They should also apply their knowledge and understanding of division and use materials and diagrams to divide proper fractions by whole numbers.

Long Division:

Example:

432 ÷ 15 becomes

$$\begin{array}{r} 28 \text{ r } 12 \\ 15 \overline{) 432} \\ \underline{30} \\ 132 \\ \underline{150} \\ 12 \end{array}$$

Answer: 28 remainder 12

432 ÷ 15 becomes

$$\begin{array}{r} 28 \\ 15 \overline{) 432} \\ \underline{30} \\ 132 \\ \underline{150} \\ 12 \end{array}$$

15×20
 15×8

$$\frac{12}{15} = \frac{4}{5}$$

Answer: $28\frac{4}{5}$

432 ÷ 15 becomes

$$\begin{array}{r} 28.8 \\ 15 \overline{) 432.0} \\ \underline{30} \\ 132 \\ \underline{150} \\ 120 \\ \underline{150} \\ 0 \end{array}$$

Answer: 28.8