

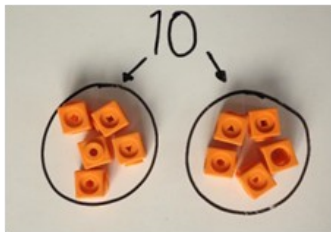


Great Linford
Primary School

Division

A handy pocket guide explaining the different stages of learning your child will go through as they learn about Division in our school.

Concrete > Pictorial > Abstract



$$\begin{array}{r} 32 \\ 3 \overline{) 96} \end{array}$$

Concrete

We begin all of our maths learning journeys with the use of concrete apparatus. This might include counters, cubes, base 10, beadstrings, numicon, weights, measuring jugs etc. Using concrete apparatus helps children to visualise the numbers and understand their relative size.

Pictorial

We then use models/images to show children a pictorial version of the apparatus they have used. We might use symbols, or draw counters instead of handing them out on tables.

Abstract

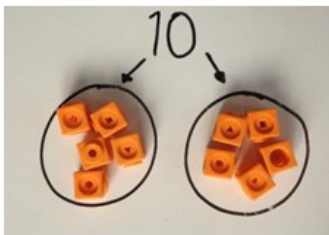
Finally, children are confident enough to just use the abstract style of recording that mathematicians use, made up of numbers and symbols.

Stage 1 - sharing and grouping

Counting objects in groups

Skills needed:

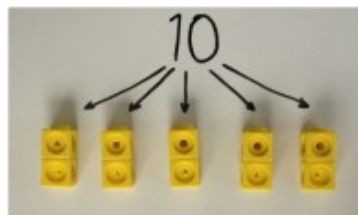
- Counting objects in multiples e.g. Pairs of socks.
- Drawing their own images to represent numbers.
- Sharing equally.
- Vocabulary linked to division e.g. Share, equal, groups
- Halving



Children use cubes, numicon, groups of beads on a beadstring etc to share amounts equally and make equal groups. E.g. I have 10 cubes, can you share them equally in 2 groups?



We then begin to understand division as grouping e.g. I have 10 cubes, can you put them in groups of 2?



At first, the division symbol is not used. Children are instead asked to share or group through real life problem solving.

We use beadstrings, numberlines and cubes to understand division as repeated subtraction. E.g. I have 12 cubes. How many groups of 3 can I take away?

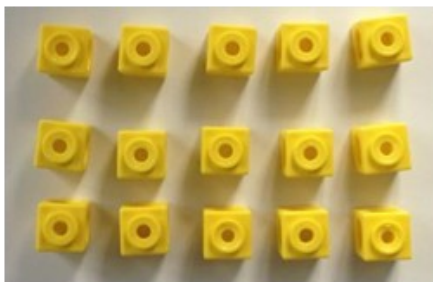


Stage 2 - arrays and numberlines

Solving division calculations using arrays and understanding remainders

Skills needed:

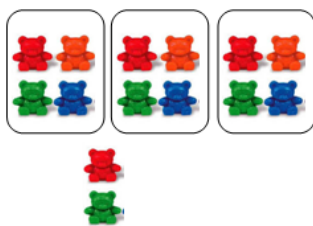
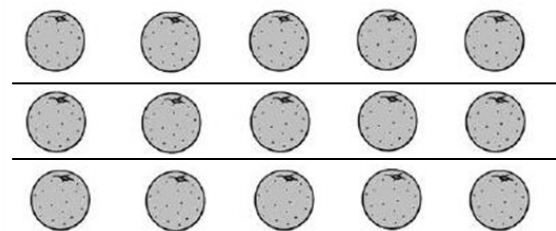
- Counting in groups and sharing equally.
- Recording number sentences using the \div symbol.
- Know the relationship between division and subtraction.
- Know the relationship between multiplication and division.
- Knowledge of times table facts for multiplication.



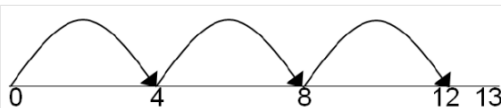
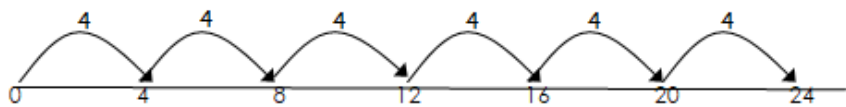
Children learn about the relationship between multiplication and division. They learn to think of division as an inverse calculation.

E.g. For $15 \div 3$ children can think 'how many 3's in 15?'

We learn to create arrays and think about the number sentences that can be created. Drawing lines to 'divide' the arrays helps us to see this connection. Any 'left over' are remainders.



$$24 \div 4 = 6$$



Number lines are used for repeated addition or multiplication to show the inverse relationship. Children begin to record remainders using the letter 'r' e.g. $13 \div 4 = 3r1$.

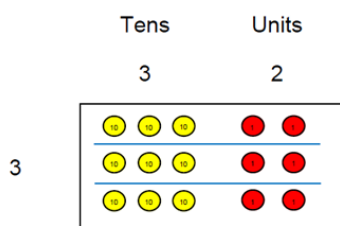
At this stage, it becomes more important for children to be able to count in multiples of different numbers to make dividing more efficient.

Stage 3 - bus stop method

Understanding how to record using formal methods

Skills needed:

- Know the relationship between division and subtraction.
- Mental recall of multiplication facts and how to multiply these by 10, 100 and 1000.
- Subtract mentally, including multiples of 10.
- Place value and partitioning of numbers.
- Place value and multiplication of decimals.



At first, place value counters are used to show the bus stop method.

$$\begin{array}{r} 32 \\ 3 \overline{) 96} \end{array}$$

The children use their known multiplication facts to think about 'how many 3's go into 96'. This simple bus stop method is taught in year 4 to most children.

$$\begin{array}{r} 213 \\ 4 \overline{) 856} \\ - 8 \\ \hline 05 \\ - 4 \\ \hline 16 \\ - 16 \\ \hline 0 \end{array} \quad \begin{array}{l} (4 \times 2 = 8) \\ (4 \times 1 = 4) \\ (4 \times 4 = 16) \end{array}$$

$$\begin{array}{r} 031.4 \\ 25 \overline{) 785.0} \\ - 0 \\ \hline 78 \\ - 75 \\ \hline 35 \\ - 25 \\ \hline 100 \\ - 100 \\ \hline 0 \end{array} \quad \begin{array}{l} (25 \times 0 = 0) \\ (25 \times 3 = 75) \\ (25 \times 1 = 25) \\ (25 \times 4 = 100) \end{array}$$

The 'long division' method involves thinking in the same way, but children record the result of their multiplication fact underneath and subtract to leave the remainder before 'bringing down' the next digit (seen in colours).

This bus stop method, including with decimals, is taught in years 5 and 6.