# DIVISION METHODS

STAGE 1 (From EYFS)

The teaching of division begins with practical activities involving sharing. Pupils are encouraged to solve problems by sharing a given number of objects, including Numicon pegs, equally between 2, 3 etc, with an emphasis on giving everyone the same amount. Children begin to halve numbers, initially by sharing an even number of objects between two.

15 shared between 3 is 5.
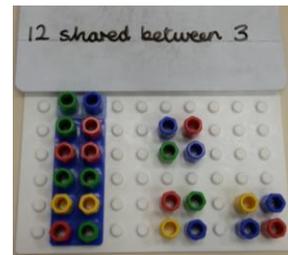
Pupils also begin to explore the concept of grouping through play, by investigating problems such as, how many Numicon 2s fit over a Numicon 10 shape?

WAYS TO SUPPORT YOUR CHILD:

- Use opportunities to share objects equally between people, eg. sharing 10 sweets between 2 people, sharing 4 juice cartons between 4.
- Encourage your child to recognise and discuss the concept of 'fairness' when sharing, for example by trying to share 5 biscuits between 2 people. What shall we do with the remaining biscuit?
- Explore ways to share 1 object between 2 people, eg. a pizza, apple, how many pieces do we need?
- If you have Numicon at home, encourage your child to explore putting repeated smaller shapes over a larger Numicon shape, as well as repeated addition through Numicon printing in playdough, paint etc.
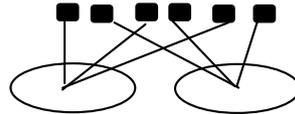
STAGE 2 (From Y1)

From Year 1 pupils begin to understand division as two main strategies and use the Numicon to solve practical problems.

Division as sharing equally

Pupils build on existing knowledge to share objects equally.

6 sweets shared equally between 2 people, how many sweets does each person get?

Given that the Numicon shapes cannot be cut, the Numicon pegs (or 1 shapes) are instead used to explore sharing problems, encouraging pupils to make the correct Numicon patterns with the shared shapes.
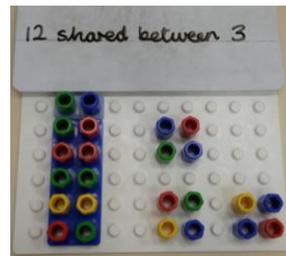
**Division as grouping**

Children begin to understand that division can be calculated by finding 'how many' groups of the same size.

*There are 10 socks on the washing line, how many pairs can we make?*

The Numicon shapes and pegs are used to model this concept, with pupils first exploring by taking away groups of pegs, then the formal use of Numicon shapes to cover the total with 'groups of'.
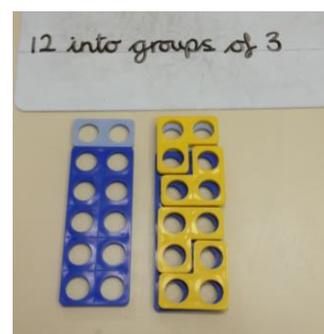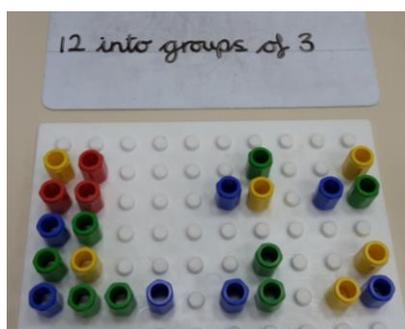
STAGE 2 (Continued)

When ready, pupils will then begin to use the Numicon horizontally along the tens line to explore how many of the same Numicon piece will fit over a given number.
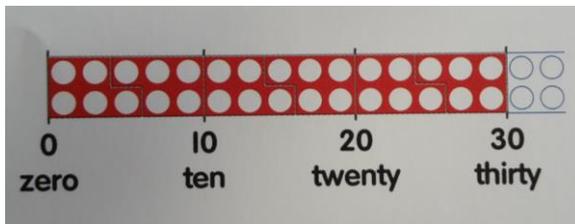
How many 5s in 30?

WAYS TO SUPPORT YOUR CHILD:

- Continue to use opportunities to share objects equally between people, children, teddies etc, eg. I have 12 sweets and there are 4 of us, how can we share them equally?
- Encourage your child to begin to see grouping as an element of division, grouping items into boxes, piles, stacks etc, eg. we need to put these lego bricks into piles of 4, how many groups of 4 can we make? We need to sit on the bus in pairs, how many groups of 2 can we make?
- Begin to discuss the concept of remainders by exploring what happens if a number cannot be divided or grouped equally.

STAGE 3 (From Y2)

When ready, pupils are then introduced to number lines alongside the Numicon image to model the repeated jumps of the same size, using counting on to find how many jumps are needed. Links are made between division and multiplication, with children taught to use their times tables knowledge to support their calculations.

➤ Counting in repeated groups of the same size

$8 \div 2 = 4$
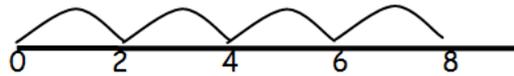
➤ Moving to partitioning to count in different sized groups

$52 \div 4 = 13$
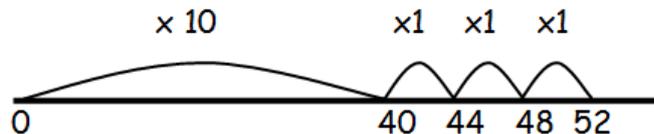
➤ Division including reminders is introduced in Year 3

$51 \div 10 = 5 \text{ r1}$
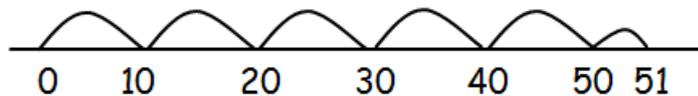
WAYS TO SUPPORT YOUR CHILD:

- Continue to use everyday opportunities to divide practically, both by sharing and grouping.
- Give your child access to bead strings, number lines and hundred squares to move along in repeated jumps to support calculations.
- Encourage your child to learn the division facts associated with times tables, eg. 2 x 3 = 6 so 6 ÷ 2 = 3 and 6 ÷3 = 2.
- Explore the concept of remainders through practical problem solving, eg. stacking 9 pieces of lego into towers of 4, grouping 14 grapes in groups of 5.

<u>STAGE 4 (From Y3)</u>

Children build on their strategy of repeating addition, by recording it more formally through 'chunking'.

Pupils begin by finding large 'chunks' of the divisor (the number they are dividing by) because it is quicker and more efficient than single steps. The chunks are then added to reach the number being divided and the chunks added up to find the answer.

$75 \div 5 = 15$

```
        50  (10)
      + 20  (4)
        70
      +  5  (1)
        75
```

To support their workings, pupils are taught to first calculate 'partial tables' or 'cheat sheets' using known facts to support their workings.

$256 \div 7$

```
1 → 7              140  (20)
2 → 14             70   (10)
4 → 28             210
8 → 56             42   (6)
5 → 35             252
10 → 70             4   (remainder)
                   256
              Answer: 36 r4
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$396 \div 14$

```
1 → 14            280  (20)
2 → 28            112  (8)
4 → 56            392
8 → 112           4   (remainder)
5 → 70           396
10 → 140      Answer: 28 r4
20 → 280
```

<u>WAYS TO SUPPORT YOUR CHILD:</u>

- Continue to rehearse times tables and doubling strategies with your child to support their calculations for partial tables.
- Remind your child to line up the digits carefully by place value.
- Practise estimating what the total of two numbers will be to help prepare your child for choosing chunks of a suitable size.
- Challenge your child to complete partial tables for large numbers.

STAGE 5 (From Y4)

Only when pupils are ready and able to use chunking confidently will they be introduced to the 'compact method' of division (also known as the 'bus stop' method).

Working through left to right, pupils calculate how many times the divisor fits into each digit in turn, recording their answer at the top. They should be able to refer to the actual values of the digits they are using (eg. 9 hundreds, not just 9).

> ➢ Compact method (no remainders)

$$3\overline{)\begin{array}{ccc} 3 & 1 & 2 \\ 9 & 3 & 6 \end{array}}$$

> ➢ Moving to compact method with remainders at the end

$$3\overline{)\begin{array}{ccc} 3 & 1 & 2\,r1 \\ 9 & 3 & 7 \end{array}}$$

> ➢ Moving to compact method with remainders in the middle (and end where appropriate)

$$3\overline{)\begin{array}{ccc} 3 & 2 & 5 \\ 9 & 7 & {}^{1}5 \end{array}}$$

WAYS TO SUPPORT YOUR CHILD:

- Reinforce the place value of each digit as your child divides and records their answer.
- Remind your child to line up digits by place value.
- Encourage your child to choose the appropriate strategy for the question. When dividing by 1 digit compact method is the most efficient, however when dividing by 2 or 3 digit numbers chunking is more suitable.

STAGE 6 (Y6)

If pupils are confident in all aspects of division taught, they will be introduced to 'long division' in Year 6.

Unlike earlier methods, long division can be used to divide by 2 digit numbers so it becomes slightly more complicated. As in 'bus stop' method, pupil begin by working through the dividend (the number being divided) from the left, calculating how many times the divisor fits into the digits and drawing down the remainder to repeat the process. It can be followed through to find the remainder as a decimal.

$$432 \div 15 \text{ becomes}$$

```
              2   8 · 8
    1   5 │ 4  3  2 · 0
            3  0 ↓
          ─────
            1  3  2
            1  2  0 ↓
          ──────────
               1  2  0
               1  2  0
             ──────────
                     0
```

Answer: 28·8

WAYS TO SUPPORT YOUR CHILD:

- Don't panic!
- Encourage your child to work through each step at a time, using squared paper to help ensure their place value is correct.
- Partial tables can also help your child to calculate their chunk before they subtract each time.