

**National Curriculum
For
Mathematics
2014**



Calculation Policy

Routes through Division

Revised and amended September 2013

EARLY SKILLS - most children from foundation stage onwards

For children to understand division they need to experience solving problems including: **grouping and sharing/ Doubling and halving**
 Pupils should experience the different types of division in a **wide range of practical, relevant contexts with real objects**

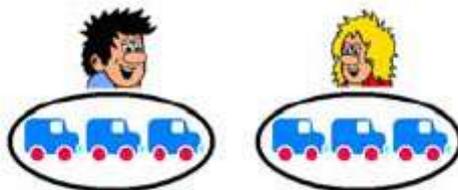
Most children from year 1 onwards

SHARING

Equal sharing occurs when a quantity is shared out equally into a given number of portions, and we work out how many there are in each portion.

When we share we know how many we have to share out and how many to share between but not how many they will each get.

6 toy cars are shared between 2 children. How many will they have each?

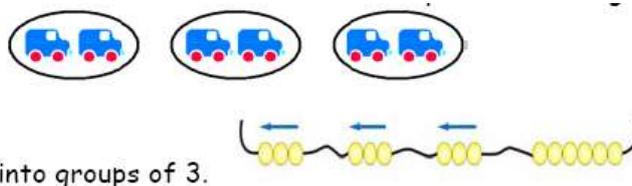


GROUPING

Grouping occurs when we are asked to find how many groups of the divisor are in the original amount.

We know how many we have and how many to put into each 'set' but not the number of 'sets' we will have.

There are 6 cars; each child can have 2 cars. How many children will get 2 cars?



ARRAYS

(Link with Multiplication)

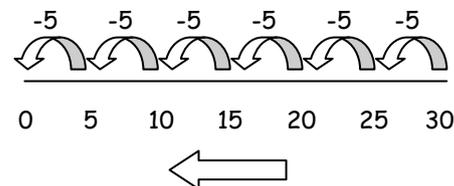


$8 \div 2 = 4, 8 \div 4 = 2$

REPEATED SUBTRACTION - most children from year 2 onwards

This moves on from drawing dots or pictures and uses numbers.
 Children use knowledge that we are subtracting the same number each time to find out how many groups we have altogether.
 Model both ways for different learners

$30 \div 5 = 6$
 - 5 = 25
 - 5 = 20
 - 5 = 15
 - 5 = 10
 - 5 = 5
 - 5 = 0
 Now count groups to get your answer



Number line modelling repeated subtraction

Recall and use Division facts for 2/5/10

Progression towards efficient written methods(including chunking) - Most children from year 3

It is important that children's mental methods of calculation are practised and secured alongside their learning and use of an efficient written method for division (Divisor 2,3,4,5,8,10. Dividend > x12 of divisor and exact answers no remainders)

The key to the efficiency of chunking lies in the estimate that is made before the chunking starts.

Estimating for HTU ÷ U involves multiplying the divisor by multiples of 10 to find the two multiples that are nearest to the HTU dividend.

For example; 174 divided by 5. $20 \times 5 = 100$, $30 \times 5 = 150$, $40 \times 5 = 200$. An estimate for 174 divided by 5 would be somewhere within the range of 30 and 40.

Estimating has two purposes when doing a division:

- to help to choose a starting point for the division;
- to check the answer after the calculation.

Children who have a secure knowledge of multiplication facts and place value should be able to move on quickly to the more efficient recording on the right.

<p>Expanded</p> $70 \div 5 = 14$ $\begin{array}{r} 14 \\ 5 \overline{) 70} \\ \underline{5} \quad (1 \times 5) \\ 65 \\ \underline{5} \quad (1 \times 5) \\ 60 \\ \underline{5} \quad (1 \times 5) \\ 55 \\ \underline{0} \\ 0 \end{array}$	<p>Shorter more efficient Method</p> $70 \div 5 = 14$ $\begin{array}{r} 14 \\ 5 \overline{) 70} \\ \underline{50} \quad (10 \times 5) \\ 20 \\ \underline{20} \quad (4 \times 5) \\ 0 \end{array}$ <p style="text-align: center;">https://www.youtube.com/watch?v=bV_ZxHguF3Q Division A</p> <p>Now try: 91 ÷ 7 54 ÷ 6 84 ÷ 4</p>
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Recall and use Division facts for 3,4,8

Progression towards efficient written methods - Most children from year 4

Short Method (No remainders)

$75 \div 5 = 15$ $\begin{array}{r} 15 \\ 5 \overline{) 75} \end{array}$	<p>https://www.youtube.com/watch?v=5TTnUyW-ICK Division B</p>	<p>Now try: 91 ÷ 7 54 ÷ 6 84 ÷ 4</p>
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Recall and use Division facts up to 12 x 12

EXPANDED' METHOD FOR HTU ÷ U LINKED TO REPEATED SUBTRACTION/CHUNKING Most children from year 5

<p>$139 \div 5 = 27 \text{ r}4$</p> $\begin{array}{r} 27 \\ 5 \overline{) 139} \\ \underline{100} \quad (20 \times 5) \\ 39 \\ \underline{35} \quad (7 \times 5) \\ 4 \end{array}$	<p>$139 \div 5 = 27 \text{ r}4$</p> $\begin{array}{r} 27 \text{ r}4 \\ 5 \overline{) 139} \end{array}$ <p style="text-align: center;">https://www.youtube.com/watch?v=gNUnk-4z6KU Division D</p> <p>Now Try: 184 ÷ 6 258 ÷ 5</p>
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Children may need to go back to the expanded method with larger numbers

<https://www.youtube.com/watch?v=836E9TngU7o>
Division C

SHORT DIVISION - most children from year 6 onwards

4-digit by 1-digit interpreting remainders within the context.
Again allow for estimation prior to short division method.

$$8 \overline{) 2347} \begin{array}{l} 29 \\ 288 \\ \hline 67 \\ 64 \\ \hline 39 \end{array}$$

Remainder as a fraction or as a decimal.
e.g; $\frac{39}{8}$ or 0.875

https://www.youtube.com/watch?v=FC_vW463YxQ

Division E

Now try:

$7353 \div 7$

$2479 \div 5$

LONG DIVISION - LINKED TO REPEATED SUBTRACTION - most children from year 6 onwards

$$24 \overline{) 6272} \begin{array}{l} 261 \text{ r } 8 \\ 2400 \text{ (100 x 24)} \\ \hline 3872 \\ 2400 \text{ (100 x 24)} \\ \hline 1472 \\ 960 \text{ (40 x 24)} \\ \hline 512 \\ 480 \text{ (20 x 24)} \\ \hline 32 \\ 24 \\ \hline 8 \end{array}$$



$$24 \overline{) 6272} \begin{array}{l} 261 \text{ r } 8 \\ 4800 \text{ (200 x 24)} \\ \hline 1472 \\ 1340 \text{ (60 x 24)} \\ \hline 32 \\ 24 \text{ (1 x 24)} \\ \hline 8 \end{array}$$

Now try:

$4763 \div 24$

$4849 \div 32$

<https://www.youtube.com/watch?v=coIMGcweSq0>

Division F

Thank you for using Berkswell's Route Through Calculation.

Please be aware that there are many very similar *and* different methods to these. You may have learnt slightly different methods to that which your children are learning within school. There may be differences between layout and presentation in these examples. The most important thing is that we encourage your children to learn a method which they are comfortable with and do not confuse them with too many contradictory strategies. The 'Route Through' is a way of making sure children understand what is happening in their maths. Skipping to the end without having been through the rest of the route may not harm you child in the short term, but could harm their chances of progressing further with maths in secondary school, due to a lack of understanding which is key to many of the more developed areas such as algebra. Thank you again for taking the time to view these examples and read through our route through calculation. It was created by a team of local schools and updated for the National Curriculum 2014.

Mr M. Penn