Division

Year 1 – group and share small quantities

Children will use objects, diagrams and pictorial representations to solve problems involving both grouping and sharing. They will understand equal groups and share items out in play and problem solving.

They will share a set of objects equally:

6 sweets shared between 2 people - how many will they each get?

They will understand division as repeated subtraction, which should be shown on a numberline, on a bead string and using Numicon:

12 ÷ 3 = 4

Children should be presented with practical problem solving activities involving counting equal sets or groups:

How many groups of 4 can be made with 12 stars? = 3

Children should have access to a wide range of counting equipment, everyday objects, number tracks and number lines, and be shown numbers in different contexts.

Key skills:
- Solve one-step problems involving division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher
- Make connections between arrays, number patterns, and counting in twos, fives and tens
- Begin to understand halving using concrete objects and pictorial representations.

Key vocabulary:
share, share equally, one each, two each..., group, groups of, lots of, array
Division

Year 2 – group and share, using the ÷ and = signs

Children use repeated subtraction, grouping, sharing and arrays to develop their understanding of division.

\[ 12 \div 3 = 4 \]

Children should be able to model a division calculation using an array. This represents \( 12 \div 3 \), posed as how many groups of 3 are in 12? Pupils should also show that the same array can represent \( 12 \div 4 = 3 \) if grouped horizontally:

They should understand the difference, and the relationship, between grouping and sharing:

- 6 sweets shared between 2 people – how many will they each get?
- There are 6 sweets, how many people can have 2 sweets each?

They will use symbols to stand for unknown numbers to complete equations using inverse operations:

\[ \Box \div 2 = 4 \]
\[ 20 \div \triangle = 4 \]
\[ \Box \div \triangle = 4 \]

Key skills:
- Recall and use division facts for the 2, 5 and 10 multiplication tables, including recognising odds and evens
- Calculate mathematical statements for division within the multiplication tables and write them using the ÷ and = signs.
- Know that division of one number by another cannot be done in any order
- Solve a range of problems involving division, using concrete objects, arrays, repeated subtraction, mental methods, and division facts derived from multiplication facts
- Use a variety of language to discuss and describe multiplication.

Key vocabulary:
share, share equally, one each, two each…, group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over
Division

Year 3 – divide 2-digit numbers by a single digit number

Children will continue to use repeated subtraction on an empty numberline to divide. They will begin to use a more formal written method (‘chunking’) when dividing larger numbers where there is no remainder.

24 ÷ 4 = 6

They will extend this method to calculations where there is a remainder:

13 ÷ 4 = 3 r 1

Once children are secure with division as grouping and can demonstrate this using number lines, arrays etc., a more formal written method (‘chunking’) should be introduced, initially with carefully selected examples which have no remainders:

70 ÷ 5

Key skills:
- Recall and use division facts for the 2, 3, 4, 5, 8 and 10 multiplication tables, and divide multiples of 10
- Write and calculate number statements using the multiplication tables they know, including 2-digit ÷ single digit, drawing upon mental methods, and progressing to formal written methods
- Solve division problems, including missing number problems
- Solve simple problems in contexts, deciding which operations and methods to use
- Develop efficient mental methods to solve a range of problems, for example, using multiplication and division facts (e.g. using 3 × 2 = 6, 6 ÷ 3 = 2 and 2 = 6 ÷ 3) to derive related facts (30 × 2 = 60, so 60 ÷ 3 = 20 and 20 = 60 ÷ 3).

Key vocabulary:
share, share equally, one each, two each..., group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, inverse, chunking, carry, remainder, multiple
Division
Year 4 – divide up to 3-digit numbers by a single digit number

Children will move develop their use of chunking. They will be introduced to short division if appropriate.

They will develop their understanding of chunking, including calculations which have a remainder:

\[
\begin{align*}
96 \div 6 &= 16 \\
196 \div 6 &= 32 \text{ r } 4
\end{align*}
\]

Answer: 16
Answer: 32 r 4

Children who are confident and accurate when dividing 2 and 3-digit numbers by a single digit this way can be introduced to short multiplication:

They should start with numbers that don’t involve carrying (each digit is a multiple of the divisor):

\[
\begin{array}{c}
32 \\
3) \ 96
\end{array}
\]

They will extend this method to calculations where there is no remainder in the final answer, but with remainders occurring within the calculation:

\[
\begin{array}{c}
18 \\
4) \ 732
\end{array}
\]

Questions should include money and measures contexts when they are confident.

Key skills:
- Recall division facts for all numbers up to 12 x 12
- Use place value, known and derived facts to divide mentally, e.g. dividing by 0, 1, 10 and 100
- Use the formal written method for short division to divide by a one-digit number
- Solve two-step problems in contexts, choosing the appropriate operation, working with increasingly complex numbers.

Key vocabulary:
share, share equally, one each, two each..., group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, inverse, chunking, carry, remainder, multiple, divisible by, factor, short division
Division

Year 5 – divide up to 4-digit numbers by a single digit

Children will develop their understanding of short division and extend the method to more complex calculations. They will continue to use chunking for long division. They must be taught to approximate first in order to minimise errors.

Children move onto dividing numbers with up to 3-digits by a single digit:

\[
\begin{array}{c}
218 \\
\hline
4 \\
\end{array}
\]

When the answer for the first column is zero, children should write a zero above to acknowledge its place, and must always carry the number over to the next digit as a remainder:

\[
\begin{array}{c}
037 \\
5 \overline{1835} \\
\end{array}
\]

When confident, they can extend the method to calculations involving remainders. They should use the context of the question to interpret the remainder appropriately:

\[
\begin{array}{c}
0663 \underline{r} 5 \\
8 \overline{53029} \\
\end{array}
\]

Children should continue to practise chunking as a formal written method for long division (when dividing by a 2-digit number).

Key skills:

- Identify multiples and factors, using knowledge of multiplication tables to 12x12
- Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers
- Establish whether a number up to 100 is prime and recall prime numbers up to 19
- Divide numbers mentally using known facts
- Divide numbers up to 4 digits by a 1-digit number using the formal written method of short division and interpret remainders appropriately for the context
- Divide integers and decimals by 10, 100 and 1000
- Solve division problems using knowledge of factors and multiples, squares and cubes
- Solve division problems including scaling by simple fractions and problems involving simple rates
- Solve problems involving combinations of operations, choosing and using calculations and methods appropriately.

Key vocabulary:

share, share equally, one each, two each..., group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, inverse, chunking, carry, remainder, multiple, divisible by, factor, short division, quotient, prime number, prime factors, composite number (non-
Division

Year 6 – divide at least 4-digit numbers by both 1-digit and 2-digit numbers

Children will use the formal methods for short and long division to answer questions involving more complex numbers. They must continue to approximate first.

When given examples that give rise to remainders, children should consider the meaning of the remainder within the context of the problem and decide how to express it, i.e. as a fraction, a decimal, or as a rounded number or value:

Key skills:
- Use rounding and place value to make approximations before calculating and use these to check answers
- Recall and use multiplication and division facts for all numbers to 12 x 12 for more complex calculations
- Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
- Divide numbers up to 4 digits by a 1-digit number using the formal written method of short division and interpret remainders appropriately for the context
- Use formal written methods to divide money and measures, and to divide numbers with up to 2 decimal places by a single digit
- Perform mental calculations, including with mixed operations and large numbers
- Solve division problems in a range of contexts.

Key vocabulary:
share, share equally, one each, two each..., group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, inverse, chunking, carry, remainder, multiple, divisible by, factor, short division, quotient, prime number, prime factors, composite number (non-prime), common factor