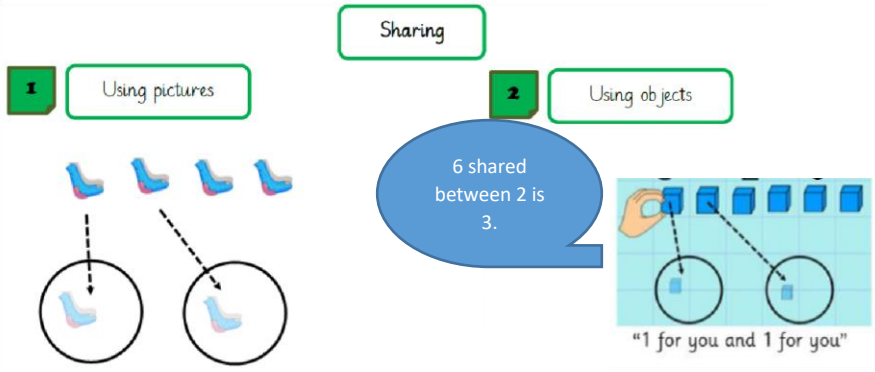
Foundation Stage 1 - Division

Curriculum 2014 Statutory Requirements

Pupils should be taught to:

- Birth to 11 months - notice changes in number of objects / images, sounds in groups of and up to 3.
- 8 to 20 months - has some understanding that things exist even when out of sight.
- 16 to 26 months - begins to organise and categorise objects.
- 22 to 36 months - knows that a group of things changes in quantity when something is added or taken away.
- 30 to 50 months - shows an interest in number problems.
- 40 to 60 months - counts objects to 10 and is beginning to count beyond 10.

In practical activities and discussions begins to use the vocabulary involved with multiplying.



Teaching points:

Use number lines 0 – 10.

Explore numbers in the environment, inside and out.

Use a range of objects.

Model in role-play areas.

Start introducing the idea of halving.

Key vocabulary

Group of, lots of, count out, share out.

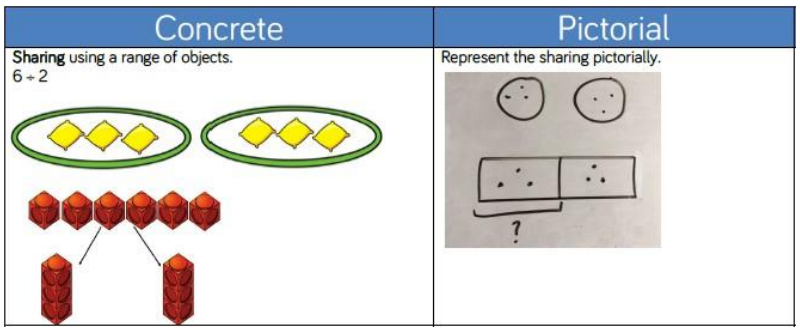
Foundation Stage 2 – Division

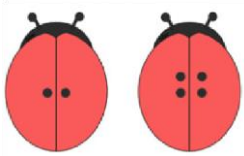
Curriculum 2014 Statutory Requirements

Pupils should be taught to:

Early Learning Goals:

- Count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number.
- Using quantities and objects, add and subtract two single digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing.





Practically halving objects – both halves being exactly the same size. Start with playdough and objects you can cut and then progress to practical objects, e.g. cut the pizza in half to make two pieces. Then add toppings, e.g. If we have 2 tomatoes, we will need to put 1 on each half.

Teaching points:

Use number lines 0 – 20.

Counting and reading numbers to 20.

Halving using objects.

Sharing using objects.

Opportunities to apply in real life situations – role play and sharing out fruit at snack time.

Model in role-play areas, including halving.

Key vocabulary

Group of, lots of, count out, share out, double, halve, half of, halving, times, array.

Year 1 – Division

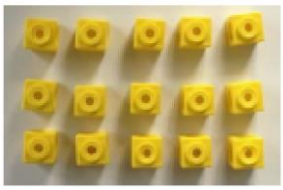
Curriculum 2014 Statutory Requirements

Pupils should be taught to:

- Solve one-step problems, including division, by calculating the answer using concrete objects, pictorial representations and arrays, with the support of the teacher.

Pupils begin by reinforcing prior learning where division is understood by grouping and sharing:

12 girls play a game in groups of 4. How many groups are there?

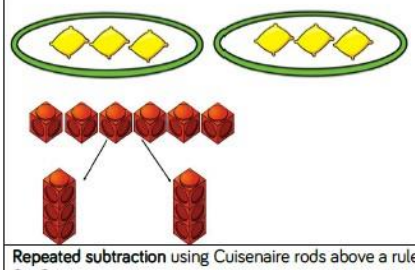
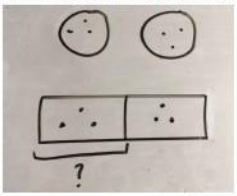
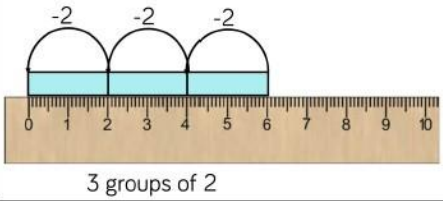
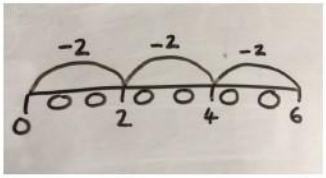
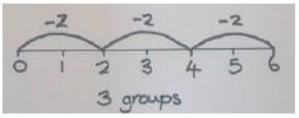


Eg $15 \div 3 = 5$ $5 \times 3 = 15$
$15 \div 5 = 3$ $3 \times 5 = 15$

Teaching points:

Children physically group items and count in groups. Model forming arrays, to be organised and systematic to aid counting in multiples.

Link division and multiplication by creating an array and thinking about the number sentences that can be created.

Concrete	Pictorial	Abstract
Sharing using a range of objects. $6 \div 2$ 	Represent the sharing pictorially. 	$6 \div 2 = 3$  Children should also be encouraged to use their 2 times tables facts.
Repeated subtraction using Cuisenaire rods above a ruler. $6 \div 2$  3 groups of 2	Children to represent repeated subtraction pictorially. 	Abstract number line to represent the equal groups that have been subtracted. 

Key vocabulary (new words to year 1 are in red)

Double, halve, half of, share, array, share equally, one/ two/ three… each, group in pairs, threes…tens, equal groups of, ÷, divide, divided by, divided into, left, left over.

Year 2 - Division

Curriculum 2014 Statutory Requirements

Pupils should be taught to:

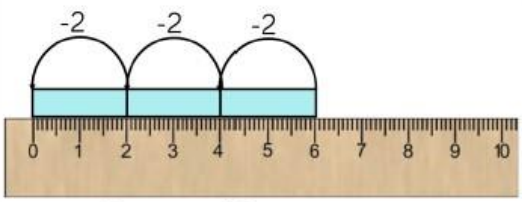
- Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers.
- Calculate mathematical statements for division within the multiplication tables and write them using the signs ÷ and =
- Show that multiplication of two numbers is commutative but division is not.
- Solve problems involving division using materials, arrays, repeated addition, mental methods and division facts, including problems in contexts.

Teaching points:

Calculations here build on expected known multiplication facts, where division is by a divisor of 2 , 5 and 10 initially, progressing to Y3 multiplication facts of 3, 4 and 6 also.

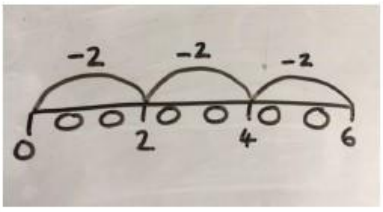
Methods should build on that from Year 1:

Repeated subtraction using Cuisenaire rods above a ruler.
6 ÷ 2

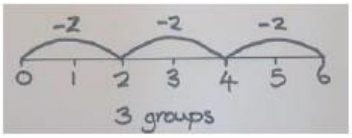


3 groups of 2

Children to represent repeated subtraction pictorially.



Abstract number line to represent the equal groups that have been subtracted.

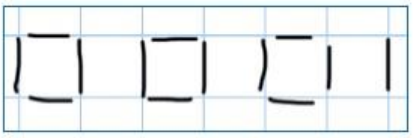


2d ÷ 1d with remainders using lollipop sticks. Cuisenaire rods, above a ruler can also be used.
13 ÷ 4

Use of lollipop sticks to form wholes- squares are made because we are dividing by 4.

There are 3 whole squares, with 1 left over.

Children to represent the lollipop sticks pictorially.

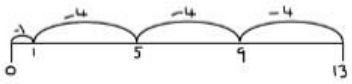


There are 3 whole squares, with 1 left over.

13 ÷ 4 = 3 remainder 1

Children should be encouraged to use their times table facts; they could also represent repeated addition on a number line.

'3 groups of 4, with 1 left over'



Key vocabulary (new words to year 2 are in red)

Double, halve, half of, share, array, share equally, one/ two/ three… each, group in pairs, threes…tens, equal groups of, ÷, divide, divided by, divided into, left, left over, remainder.

Year 3 - Division

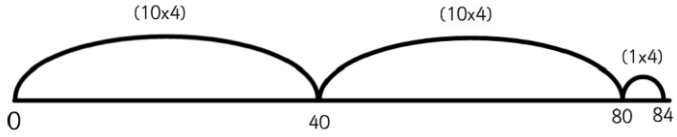
Curriculum 2014 Statutory Requirements

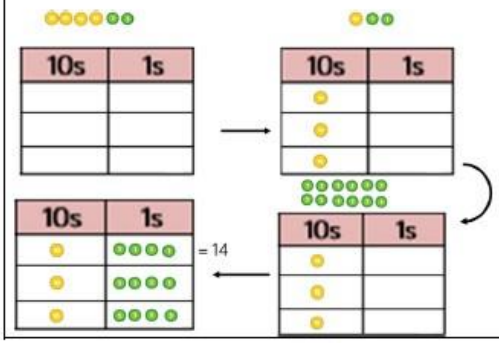
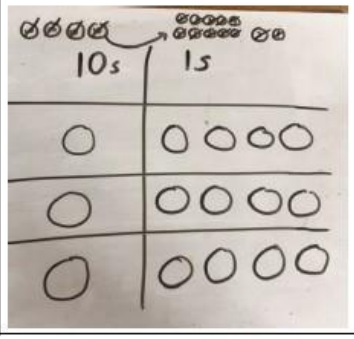
Pupils should be taught to:

- Recall and use multiplication and division facts for the 3, 4 and 8 x tables.
- Write and calculate mathematical statements for division using the multiplication tables they know, including 2 digit divided by 1 digit using mental and progressing to formal written methods.
- Solve problems, involving missing number problems, involving di vision, including positive number scaling.
- Problems and correspondence problems where 'n' objects are connected to m objects.

Teaching points:

Build on understanding of using a number line to develop chunks.



Concrete	Pictorial	Abstract
Sharing using place value counters. 42 ÷ 3 = 14 	Children to represent the place value counters pictorially. 	Children to be able to make sense of the place value counters and write calculations to show the process. 42 ÷ 3 42 = 30 + 12 30 ÷ 3 = 10 12 ÷ 3 = 4 10 + 4 = 14

Key vocabulary (new words to year 3 are in red)

Double, halve, half of, share, array, share equally, one/ two/ three… each, group in pairs, threes…tens, equal groups of, ÷, divide, division, divided by, divided into, left, left over, remainder, how many groups of … go into…?

Year 4 - Division

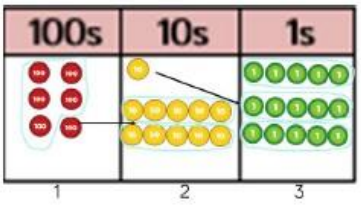
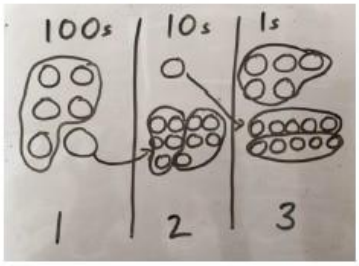
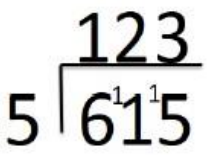
Curriculum 2014 Statutory Requirements

Pupils should be taught to:

- Recall multiplication and division facts up to 12 x 12.
- Use place value, known and derived facts to divide mentally, including dividing by 1.
- Solve problems involving division.

Teaching points:

Ensuring an understanding of the relationship between ÷ and X, pupils build on Year 3 to divide 3 digit numbers by 1 digit numbers.

Concrete	Pictorial	Abstract
Short division using place value counters to group. 615 ÷ 5  1. Make 615 with place value counters. 2. How many groups of 5 hundreds can you make with 6 hundred counters? 3. Exchange 1 hundred for 10 tens. 4. How many groups of 5 tens can you make with 11 ten counters? 5. Exchange 1 ten for 10 ones. 6. How many groups of 5 ones can you make with 15 ones?	Represent the place value counters pictorially.  	Children to the calculation using the short division scaffold. 

Key vocabulary (new words to year 4 are in red)

Double, halve, half of, share, array, share equally, one/ two/ three… each, group in pairs, threes…tens, equal groups of, ÷, divide, divided by, divided into, divisible by, remainder, factor, quotient, inverse.

Year 5 - Division

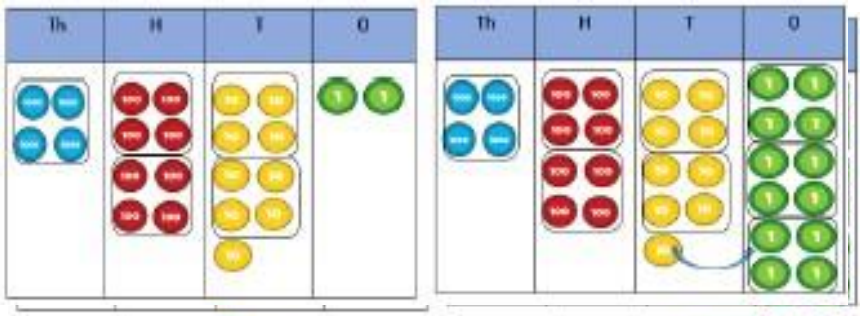
Curriculum 2014 Statutory Requirements

Pupils should be taught to:

- Identify multiples and factors, including finding all factor pairs of a number, common factors of two numbers, know and use the vocabulary of prime numbers and establish whether a number up to 100 is prime.
- Multiply and divide numbers mentally drawing on known facts.
- Divide numbers up to 4 digits by a one digit number using a written method and interpret remainders appropriately for the context.
- Divide whole numbers and those involving decimals by 10, 100 and 1000.

Teaching points:

Pupils develop use of the short division method started in Year 4.
These concrete, pictorial and abstract approaches should also be used to develop and consolidate understanding of remainders.

Concrete	Pictorial	Abstract
		1223 4 | 4894 r2

Place value sliders could be used to support division by powers of 10.

Key vocabulary (new words to year 5 are in red)

Double, halve, half of, share, share equally, one/ two/ three… each, group in pairs, threes…tens, equal groups of, ÷, divide, divided by, divided into, divisible by, divisor, remainder, factor, quotient, inverse, long division, short division.

Year 6 - Division

Curriculum 2014 Statutory Requirements

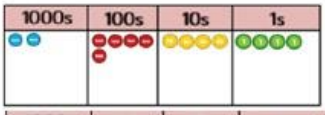
Pupils should be taught to:

- Divide numbers up to 4 digits by a two-digit 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 two-digit number using the formal written method of short division as appropriate.

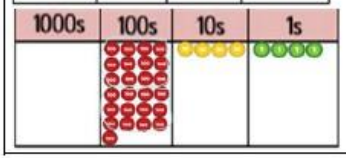
Teaching points:

Concrete	Pictorial	Abstract

Long division using place value counters
2544 ÷ 12

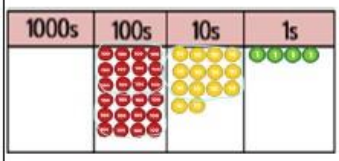


We can't group 2 thousands into groups of 12 so will exchange them.



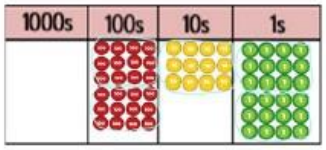
We can group 24 hundreds into groups of 12 which leaves with 1 hundred.

$$\begin{array}{r} 02 \\ 12\overline{)2544} \\ 24 \\ \hline 1 \end{array}$$



After exchanging the hundred, we have 14 tens. We can group 12 tens into a group of 12, which leaves 2 tens.

$$\begin{array}{r} 021 \\ 12\overline{)2544} \\ 24 \\ \hline 14 \\ 12 \\ \hline 2 \end{array}$$



After exchanging the 2 tens, we have 24 ones. We can group 24 ones into 2 group of 12, which leaves no remainder.

$$\begin{array}{r} 0212 \\ 12\overline{)2544} \\ 24 \\ \hline 14 \\ 12 \\ \hline 24 \\ 24 \\ \hline 0 \end{array}$$

Key vocabulary (new words to year 6 are in red)

Double, halve share, share equally one each, two each, three each... group in pairs, threes... tens equal groups of divide, divided by, divided into, divisible by, divisor, remainder factor, quotient, divisible by inverse long division, short division