

Vocabulary

Key Questions

share, share equally, one each, two each..., group, groups of, lots of, array

How many groups of...?
 How many in each group?
 Share... equally into...
 What can do you notice?

Example Questions

Basic



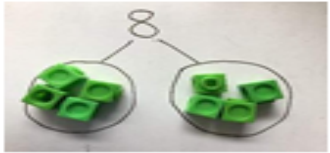


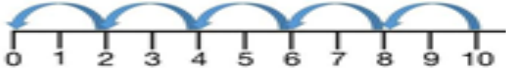

Advancing

Deep

Use ...and ... in a number sentence.
Illustrate the problem
Memorise the division facts for the ... times table
Match the answers to the number problems
Tell a friend how you solved the problem

Compare which method you prefer to use
Modify the numbers to change the answer
Organise the numbers into a number sentence.

Prove how you know the answer is...
Investigate how many different ways you can make ...using division.
Explain your method
Create two division number sentences from the given numbers.

	Objective	Concrete	Pictorial	Abstract
Year 1/2	Sharing	I have 8 cubes, can you share them equally between two people? 	Children use pictures or shapes to share quantities.  $8 \div 2 = 4$	Share 8 buns between two people. $8 \div 2 = 4$ 
	Grouping	Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.  	Use a number line to show jumps in groups. The number of jumps equals the number of groups.  Think of the bar as a whole. Split it into the number of groups you are dividing by and work out how many would be within each group.  $10 \div 5 = ?$ $5 \times ? = 10$	$10 \div 5 = 2$ Divide 10 into 5 groups. How many are in each group?

Key Questions

How many 10s can you subtract from 60?
 I think of a number and double it. My answer is 8. What was my number?
 If $12 \times 2 = 24$, what is $24 \div 2$?
 Questions in the context of money and measures (e.g. how many 10p coins do I need to have 60p? How many 100ml cups will I need to reach 600ml?)

Vocabulary

group in pairs, 3s ... 10s etc
 equal groups of, divide, \div , divided by, divided into, remainder

Example Questions

Basic



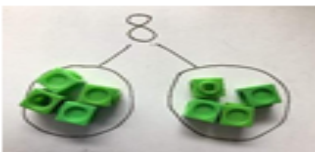


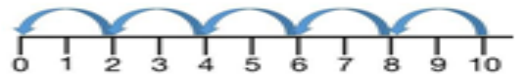
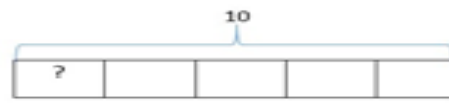
Advancing

Deep

Use ...and ... in a number sentence.
Illustrate the problem
Memorise the division facts for the ... times table
Match the answers to the number problems
Tell a friend how you solved the problem

Compare which method you prefer to use
Modify the numbers to change the answer
Organise the numbers into a number sentence.

Prove how you know the answer is...
Investigate how many different ways you can make ...using division.
Explain your method
Create two division number sentences from the given numbers.

	Objective	Concrete	Pictorial	Abstract
Year 1/2	Sharing	I have 8 cubes, can you share them equally between two people? 	Children use pictures or shapes to share quantities.  $8 \div 2 = 4$	Share 8 buns between two people. $8 \div 2 = 4$ 
	Grouping	Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.  	Use a number line to show jumps in groups. The number of jumps equals the number of groups.  Think of the bar as a whole. Split it into the number of groups you are dividing by and work out how many would be within each group.  $10 \div 5 = ?$ $5 \times ? = 10$	$10 \div 5 = 2$ Divide 10 into 5 groups. How many are in each group?

Vocabulary

Key Questions

See Y1 and Y2 inverse

Questions in the context of money and measures that involve remainders (e.g. How many lengths of 10cm can I cut from 81cm of string? You have £54. How many £10 teddies can you buy?) What is the missing number? $17 = 5 \times 3 + \underline{\quad}$ $\underline{\quad} = 2 \times 8 + 1$

Example Questions

Basic





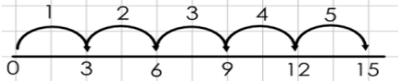
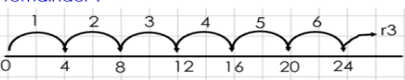
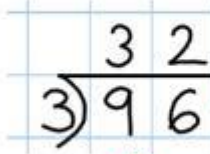
Advancing

Deep

Arrange your division calculation in a different order
Use a different division method to solve the calculation.
Describe your method of division to a partner.
Tell a friend how you solved the problem

Organise your calculation as a written method.
Explain your method
Estimate the answer
Compare two written methods and **explain** which one is your preferred method.
Apply your written method to solve.

Prove you are correct
Create a word problem
Create a help sheet to explain the written method that you have used.
Investigate the daily journey time/distance if travelled for x amount of days.

	Objective	Concrete	Pictorial	Abstract
Year 3/4	Division with arrays	Link division to multiplication by creating an array and thinking about the number sentences that can be created. Eg $15 \div 3 = 5$ $5 \times 3 = 15$ $15 \div 5 = 3$ $3 \times 5 = 15$ 	 <p>Draw an array and use lines to split the array into groups to make multiplication and division sentences.</p>	Find the inverse of multiplication and division sentences by creating four linking number sentences. $5 \times 3 = 15$ $3 \times 5 = 15$ $15 \div 5 = 3$ $15 \div 3 = 5$
	Short division	Use place value counters to divide using the short division method alongside. $96 \div 3$  $42 \div 3$ <p>Start with the biggest place value. We are sharing 40 into three groups. We can put 1 ten in each group and we have 1 ten left over. We exchange this ten for 10 ones and then share the ones equally among the groups. We look at how many are in each group.</p> 	$15 \div 3 = 5$ Count in 3s until reaching 18.  $27 \div 4 = 6 \text{ r } 3$ For 'remainders', count in 4s until just before 27, as you can't land directly on 27. What is left over is the 'remainder'. 	<p>Short division: Limit numbers to NO remainders in the answer OR carried (each digit must be a multiple of the divisor).</p> 

Vocabulary

Key Questions

see year 4
 common factors, prime number, prime factors
 composite numbers, short division
 square number, cube number
 inverse, power of

What do you notice?
 What's the same? What's different?
 Can you convince me?
 How do you know?

Basic

Advancing

Deep

Use bus stop method to divide... by ...
List all the different vocabulary for division.
Tell me the method you have used to find the total

Predict if $a \div b$ would total an odd or an even number.
Estimate the answer to ..., work out the answer to check your estimation.
Explain your method.
Organise your calculation

Create your own word problem.
Design your own recipe for 4 meal then scale it down for 2 people.
Investigate how many miles would be travelled each day if given a distance and total number of days travelled.

	Objective	Concrete	Pictorial	Abstract
Year 5	Division With remainders	See Year 4 for concrete method. (Using numbers where there would be a remainder.)	<p>division by chunking on a numberline</p> <p>$96 \div 4 = 24$</p> <p>How many lots of 4 altogether? $10 + 10 + 4 = 24$</p>	<p>$96 \div 6 = 16$ (without remainders)</p> $\begin{array}{r} 96 \\ - 60 \\ \hline 36 \\ - 36 \\ \hline 0 \end{array}$ <p>The idea is to get as close to 0 as possible subtracting away multiples</p> <p>$98 \div 6 = 16r2$ (with remainders)</p> $\begin{array}{r} 98 \\ - 60 \\ \hline 38 \\ - 36 \\ \hline 2 \end{array}$ <p>no more 'chunks of 6' can be subtracted So 2 becomes the remainder</p> <p>$98 \div 6 = 16r2$</p>
	Short division With remainders	<p>$364 \div 3 =$</p> $\begin{array}{r} 121 \text{ rem } 1 \\ 3 \overline{) 364} \end{array}$	See above.	<p>Move onto divisions with a remainder.</p> $\begin{array}{r} 86 \text{ r } 2 \\ 5 \overline{) 432} \end{array}$

Vocabulary

Key Questions

see years 4 and 5

What do you notice?
 What's the same? What's different?
 Can you convince me?
 How do you know?

Example Questions

Basic

Advancing

Deep

Use bus stop method to divide... by ...
List all the different vocabulary for division.
Tell me the method you have used to find the total

Predict if $a \div b$ would total an odd or an even number.
Estimate the answer to ..., work out the answer to check your estimation.
Explain your method.
Organise your calculation

Create your own word problem.
Design your own recipe for 4 meal then scale it down for 2 people.
Investigate how many miles would be travelled each day if given a distance and total number of days travelled.

Concrete

Pictorial

Abstract

Short division with fraction remainder

$364 \div 3 =$

$$\begin{array}{r} 121 \text{ rem } 1 \\ 3 \overline{) 364} \end{array}$$

Children will draw their own counters to show their calculation.

$748 \div 9 =$

$$\begin{array}{r} 083 \frac{1}{9} \\ 9 \overline{) 748} \end{array}$$

$748 \div 16 =$

$$\begin{array}{r} 046 \frac{12}{16} = \frac{3}{4} \\ 16 \overline{) 748} \end{array}$$

The remainder above is simplified to $\frac{3}{4}$.

Short division with decimal remainder

$364 \div 3 =$

$$\begin{array}{r} 121 \text{ rem } 1 \\ 3 \overline{) 364} \end{array}$$

Children will draw their own counters to show their calculation.

$748 \div 9 =$

$$\begin{array}{r} 083.11 \\ 9 \overline{) 748.00} \end{array}$$

$748 \div 16 =$

$$\begin{array}{r} 046.75 \\ 16 \overline{) 748.00} \end{array}$$

Long division

432 ÷ 15 becomes

$$\begin{array}{r} 28 \text{ r}12 \\ 15 \overline{) 432} \\ \underline{300} \\ 132 \\ \underline{120} \\ 12 \end{array}$$

Answer: 28 remainder 12

432 ÷ 15 becomes

$$\begin{array}{r} 28 \\ 15 \overline{) 432} \\ \underline{300} \quad 15 \times 20 \\ \underline{132} \\ 120 \quad 15 \times 8 \\ \underline{120} \\ 0 \end{array}$$

$$\frac{\cancel{12}}{\cancel{15}} = \frac{4}{5}$$

Answer: $28\frac{4}{5}$

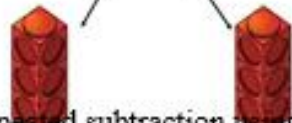
432 ÷ 15 becomes

$$\begin{array}{r} 28.8 \\ 15 \overline{) 432.0} \\ \underline{300} \quad \downarrow \\ \underline{132} \quad \downarrow \\ \underline{120} \quad \downarrow \\ 120 \quad \downarrow \\ \underline{120} \\ 0 \end{array}$$

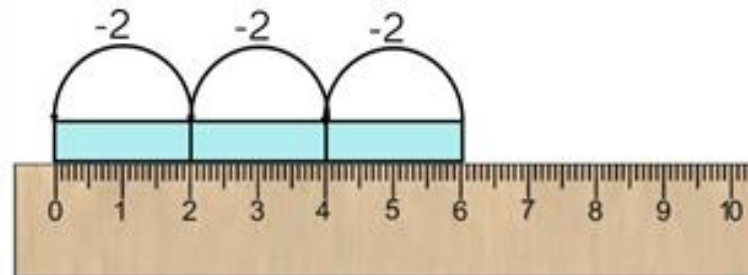
Answer: 28.8

Concrete

Sharing using a range of objects.
 $6 \div 2$



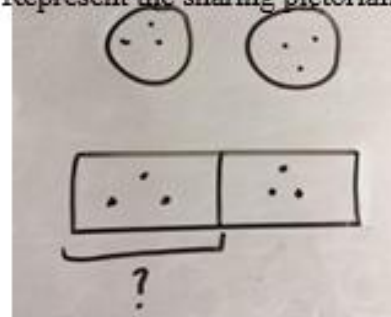
Repeated subtraction using Cuisenaire rods above a ruler.
 $6 \div 2$



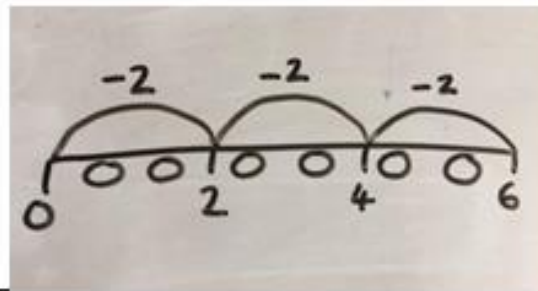
3 groups of 2

Pictorial

Represent the sharing pictorially.

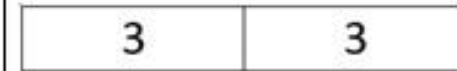


Children to represent repeated subtraction pictorially.



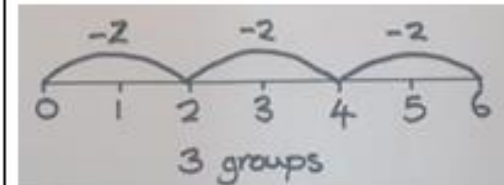
Abstract

$$6 \div 2 = 3$$



Children should also be encouraged to use their 2 times tables facts.

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



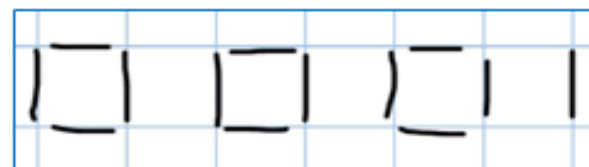
$2d \div 1d$ with remainders using lollipop sticks.
Cuisenaire rods, above a ruler can also be used.
 $13 \div 4$

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.

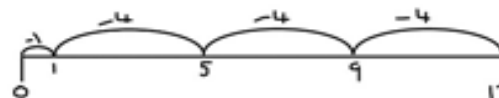


There are 3 whole squares, with 1 left over.

$13 \div 4 = 3$ remainder 1

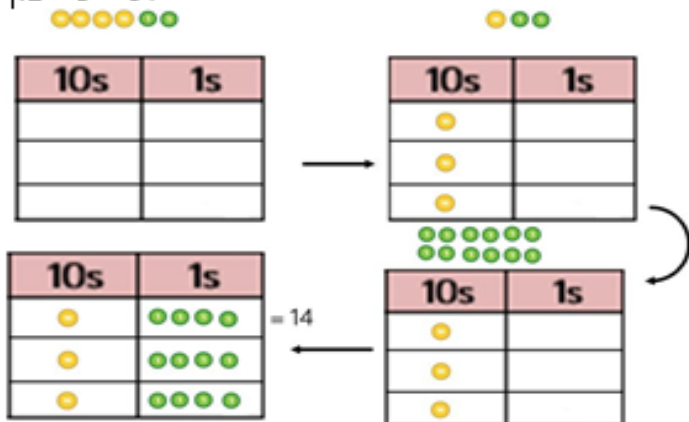
Children should be encouraged to use their times table facts; they could also represent repeated addition on a number line.

'3 groups of 4, with 1 left over

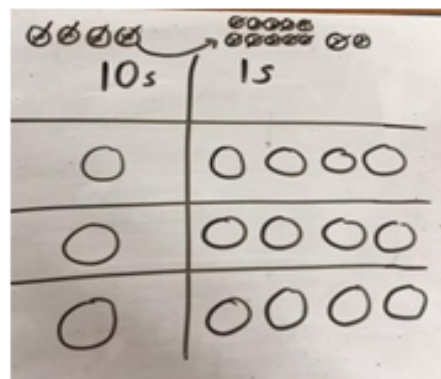


Sharing using place value counters

$42 \div 3 = 14$



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.

$42 \div 3$

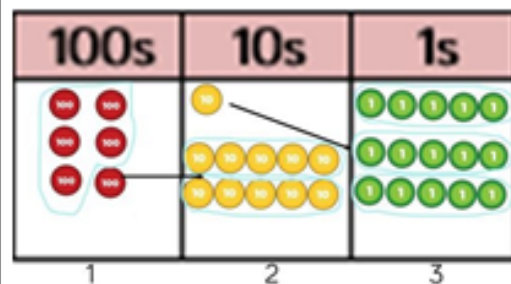
$42 = 30 + 12$

$30 \div 3 = 10$

$12 \div 3 = 4$

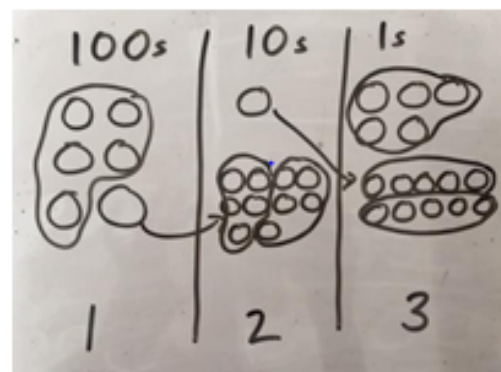
$10 + 4 = 14$

Short division using place value counters to group.
 $615 \div 5$



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.



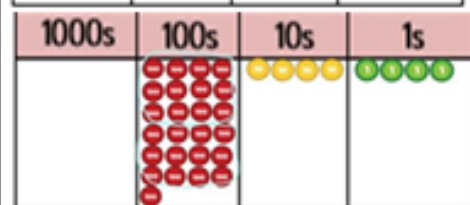
Children to the calculation using the short division scaff

$$5 \overline{) 615} \begin{matrix} 123 \\ \underline{615} \\ 0 \end{matrix}$$

Long division using place value counters - $2544 \div 12$

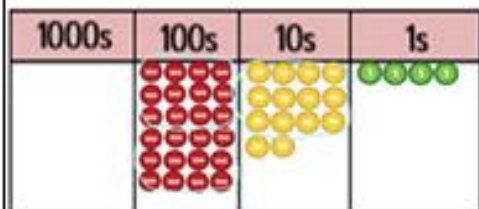


We can't group 2 thousands into groups of 12 so will exchange them.



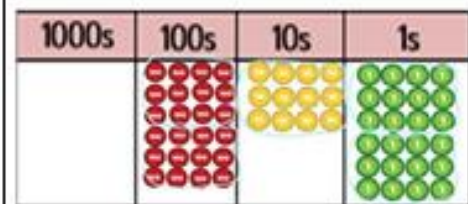
We can group 24 hundreds into groups of 12 which leaves with 1 hundred.

$$12 \overline{) 2544} \begin{matrix} 02 \\ \underline{24} \\ 1 \end{matrix}$$



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

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

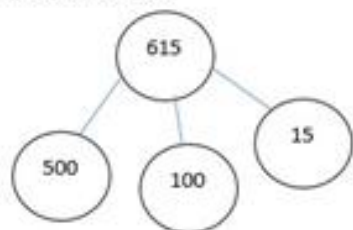


After exchanging the 2 tens, we have 24 ones. We can group 24 ones into 2 groups of 12, which leaves no remainder.

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

Conceptual variation; different ways to ask children to solve $615 \div$

Using the part whole model below, how can you divide 615 by 5 without using short division?



I have £615 and share it equally between 5 bank accounts. How much will be in each account?

615 pupils need to be put into 5 groups. How many will be in each group?

$$5 \overline{) 615}$$

$$615 \div 5 =$$

$$\square = 615 \div 5$$

What is the calculation? What is the answer?

