Year 1	Calculating strand: DIVISION

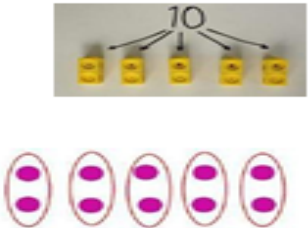| Vocabulary	Key Questions
share, share equally, one each, two each…, group, groups of, lots of, array	How many groups of…? How many in each group? Share… equally into… What can do you notice?

Example Questions

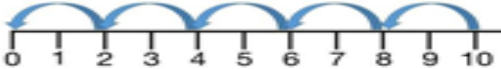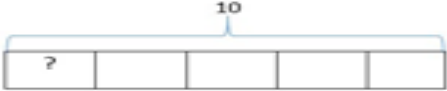| Basic	Advancing	Deep
Use …and … in a number sentence. **Illustrate** the problem **Memorise** the division facts for the … times table **Match** the answers to the number problems **Tell** a friend how you solved the problem	**Compare** which method you prefer to use **Modify** the numbers to change 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** you 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?

Year 2	Calculating strand: DIVISION

Key Questions	Vocabulary
How many 10s can you subtract from 60?	group in pairs, 3s … 10s etc
I think of a number and double it. My answer is 8. What was my number?	equal groups of, divide, ÷, divided by, divided into, remainder
If 12 x 2 = 24, what is 24 ÷ 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?)	

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** you 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 ÷ 2 = 4	Share 8 buns between two people. 8 ÷ 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 10 ÷ 5 = ? 5 x ? = 10	10 ÷ 5 = 2 Divide 10 into 5 groups. How many are in each group?

YEAR 3/4	Calculating strand: DIVISION

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? $17 = 5 \times 3 +$ ___ ___ $= 2 \times 8 + 1$

Example Questions

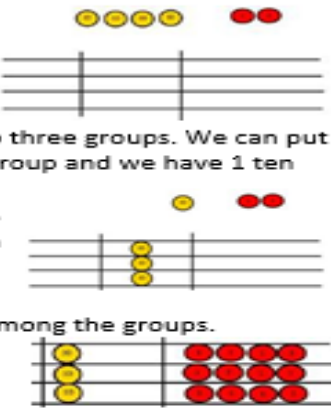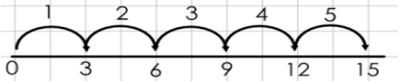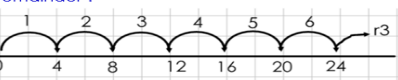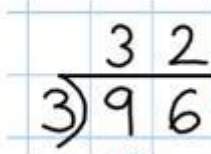| Basic	Advancing	Deep
Arrange your division calculation in a different order **Use** a different division method to solve the calculation. **Describe** your method of division to a partner. **Tell** a friend how you solved the problem	**Organise** your calculation as a written method. **Explain** your 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. $15 \div 3 = 5$ $5 \times 3 = 15$ $15 \div 5 = 3$ $3 \times 5 = 15$	Draw an array and use lines to split the array into groups to make multiplication and division sentences.	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. $96 \div 3$ $42 \div 3$ 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.	$15 \div 3 = 5$ Count in 3s until reaching 18. 1 2 3 4 5 0 3 6 9 12 15 $27 \div 4 = 6$ 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'. 1 2 3 4 5 6 r3 0 4 8 12 16 20 24	**Short division:** Limit numbers to <u>NO</u> remainders in the answer <u>OR</u> carried (each digit must be a multiple of the divisor). $3\overline{)9\ 6}$ = 32

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 ÷ 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.)		
	Short division With remainders	364 ÷ 3 =	See above.	Move onto divisions with a remainder.

YEAR 6	Calculating strand: DIVISION		

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

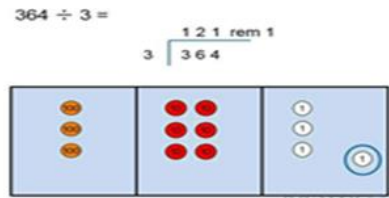| Basic	Advancing	Deep
Use bus stop method to divide… by … **List** all the different vocabulary for division. **Tell** me the method you have used to find the total	**Predict** if a ÷ b would total an odd or an even number. **Estimate** the answer to ..., work out the answer to check your estimation. **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	$364 \div 3 =$ 121 rem 1 3 ⟌ 3 6 4	Children will draw their own counters to show their calculation.	$748 \div 9 =$ 083 $\frac{1}{9}$ 9⟌74^{2}8 $748 \div 16 =$ 046 $\frac{12}{16} = \frac{3}{4}$ 16⟌74^{10}8 The remainder above is simplified to ¾.
Short division with decimal remainder	$364 \div 3 =$ 121 rem 1 3 ⟌ 3 6 4	Children will draw their own counters to show their calculation.	$748 \div 9 =$ 083.11 9⟌74^{2}8·^{1}0^{1}0 $748 \div 16 =$ 046·75 16⟌74^{10}8·^{12}0^{8}0
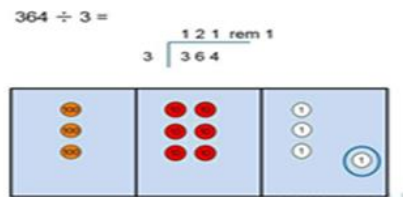
Long division

432 ÷ 15 becomes

```
        2   8   r 12
1   5 | 4   3   2
        3   0   0
        1   3   2
        1   2   0
        1   2
```

Answer: 28 remainder 12

432 ÷ 15 becomes

```
        2   8
1   5 | 4   3   2
        3   0   0     15×20
        1   3   2
        1   2   0     15×8
        1   2
```

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

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

432 ÷ 15 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

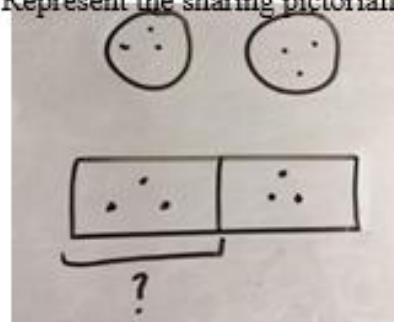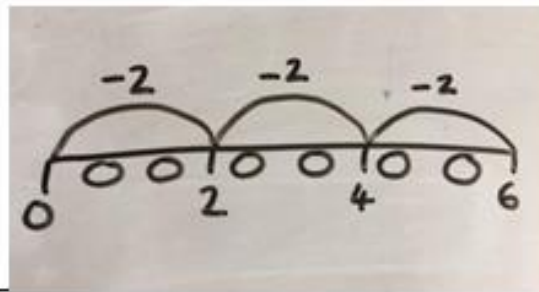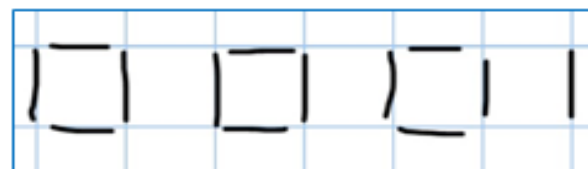| Concrete	Pictorial	Abstract
Sharing using a range of objects. 6 ÷ 2 Repeated subtraction using Cuisenaire rods above a ruler. 6 ÷ 2 3 groups of 2	Represent the sharing pictorially. Children to represent repeated subtraction pictorially. 	6 ÷ 2 = 3 Children should also be encouraged to use their 2 times tables facts. Abstract number line to represent the equal groups that have been subtracted.
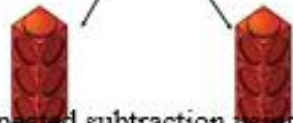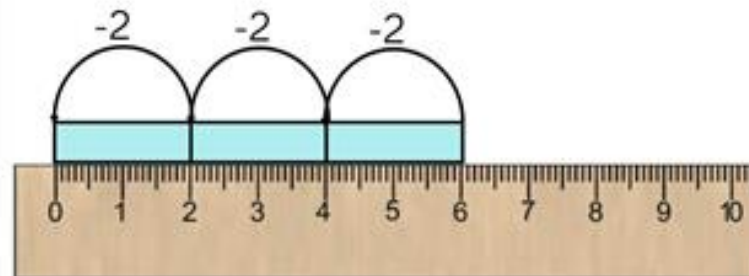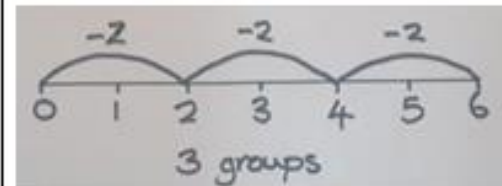
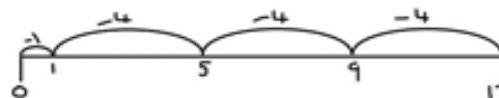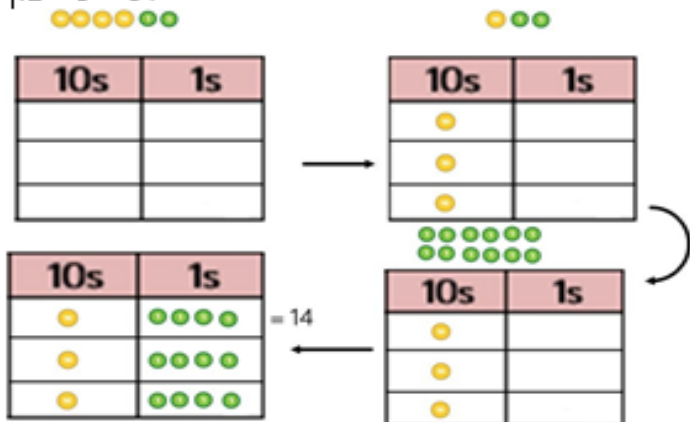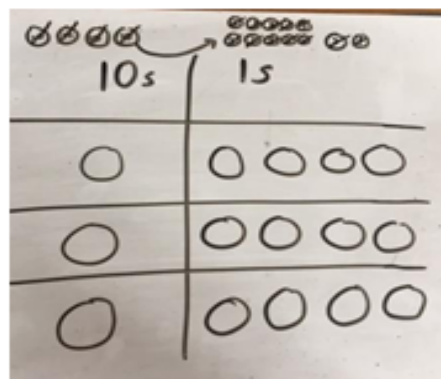|		
2d ÷ 1d with remainders using lollipop sticks. Cuisenaire rods, above a ruler can also be used. 13 ÷ 4 Use of lollipop sticks to form wholes- squares are made because we are dividing by 4. There are 3 whole squares, with 1 left over.	Children to represent the lollipop sticks pictorially. There are 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
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. $42 ÷ 3$ $42 = 30 + 12$ $30 ÷ 3 = 10$ $12 ÷ 3 = 4$ $10 + 4 = 14$

Short division using place value counters to group.
615 ÷ 5
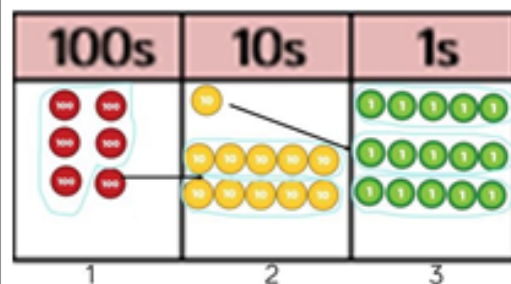
1. Make 615 with place value counters.
2. How many groups of 5 hundreds can you make with 6 hundred counters?
3. Exchange 1 hundred for 10 tens.
4. How many groups of 5 tens can you make with 11 ten counters?
5. Exchange 1 ten for 10 ones.
6. How many groups of 5 ones can you make with 15 ones?

Represent the place value counters pictorially.
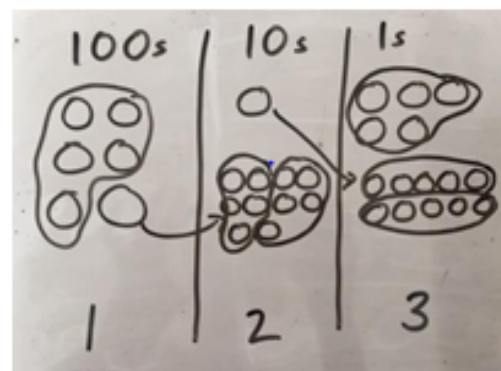
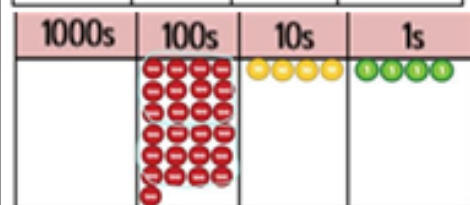Children to the calculation using the short division scaff

$$\begin{array}{r} 123 \\ 5\overline{)6^{1}1^{1}5} \end{array}$$

Long division using place value counters - 2544 ÷ 12

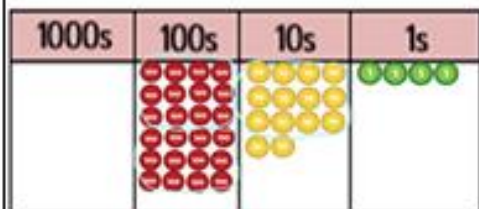

We can't group 2 thousands into groups of 12 so will exchange them.

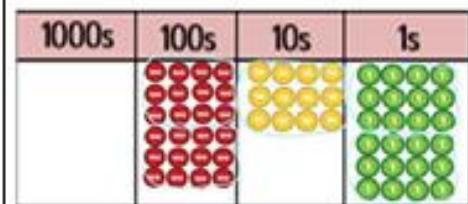We can group 24 hundreds into groups of 12 which leaves with 1 hundred.

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

1000s	100s	10s	1s

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

```
      0 2 1
12 | 2544
     24
     14
     12
      2
```
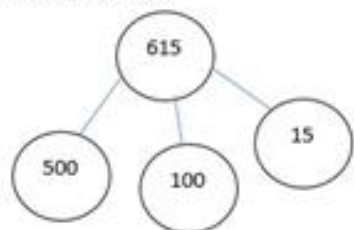
1000s	100s	10s	1s

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

```
      0 2 1 2
12 | 2544
     24
     14
     12
     24
     24
      0
```

Conceptual variation; different ways to ask children to solve 615 ÷

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

615
500
100
15

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?

$$5 \overline{)615}$$

$615 \div 5 =$

$\boxed{} = 615 \div 5$

What is the calculation? What is the answer?

100s	10s	1s