Division

| Year | Objective | Concrete | Pictorial | Abstract |
|---|---|---|---|---|
| 1 and 2 | Sharing | I have 8 cubes. Can you share them equally between two people? | Children use pictures or shapes to share quantities.<br><br>$8 \div 2 = 4$ | Share 8 buns between two people.<br>$8 \div 2 = 4$ |
| 1 and 2 | 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.<br><br>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.<br><br>$10 \div 5 = ?$<br>$5 \times ? = 10$ | $10 \div 5 = 2$<br><br>Divide 10 into 5 groups. How many are in each group? |

| 2, 3 and 4 | Times tables | | | |
|---|---|---|---|---|

Use 8 cubes.
Put them into groups of 2.
There are _____ equal groups of 2.

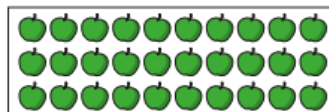Use counters to make arrays:

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

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

Apples are sold in packs of 10

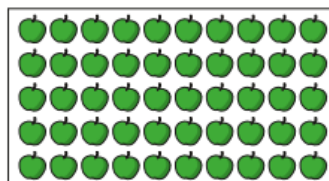Complete the sentences for the number of packs that can be made from each set of apples.
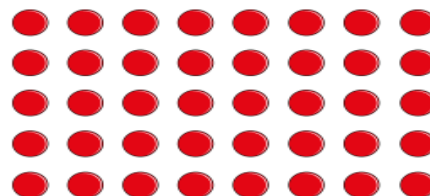
There are _____ apples.

There are _____ apples in each group.

There are _____ groups.

_____ ÷ _____ = _____
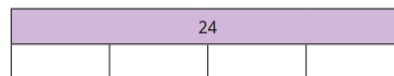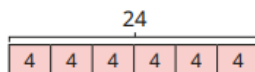
Arrays can be used and drawn on to show workings:

$40 \div 8 = \boxed{\phantom{00}}$

Use number lines with repeated subtraction to help solve division calculations:

$20 \div 4 = 5$

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Bar models can be used to show relationship between multiplication and division and to help solve divisions:

24
4 4 4 4 4 4

24

$\boxed{\phantom{0}} \div \boxed{\phantom{0}} = \boxed{\phantom{0}}$

Initially, children should complete division calculations alongside pictorial representations in arrays.

As their fluency develops, they should be able to complete division sentences:

$42 \div 7 = 6$

By the end of year 2, children should be able to recall all division facts for the 2, 5 and 10 times tables. By the end of year 3, all division facts for the 3, 4 and 8 times tables and by the end of year 4, all division facts up to the 12 times table.

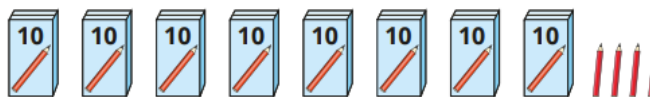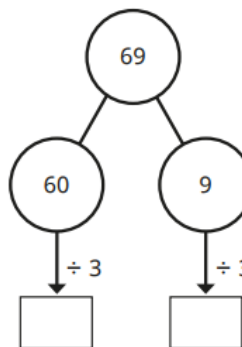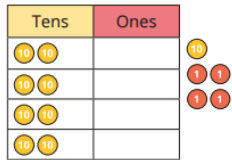| 3 | Divide a 2-digit number by 1 digit. | Use base 10 and concrete objects to divide 2-digit numbers into equal groups – start by dividing the tens.<br><br>Progress to using plave value counters, initially with no exchanges:<br>$39 \div 3 = 13$<br><br>| Tens | Ones |<br>| 10 | 1 1 1 |<br>| 10 | 1 1 1 |<br>| 10 | 1 1 1 |<br><br>Place value counters can be used to solve divisions that include exchanges:<br><br>Ron uses place value counters to work out $42 \div 3$<br>First, he shares the tens into 3 equal groups.<br>He has 1 ten and 2 ones left over.<br><br>Ron exchanges the remaining ten for 10 ones.<br>Then he shares the ones into 3 equal groups.<br>$42 \div 3 = 14$ | When using pictorial representations, encourage children to start with the tens and then move onto ones.<br><br>There are 84 pencils to be shared equally into 4 pots.<br><br>a) Draw the pencils on the place value chart to show how they are shared.<br><br>| Tens | Ones |<br>| --- | --- |<br>|  |  |<br>|  |  |<br>|  |  |<br>|  |  |<br><br>Part whole models with partitioning can be used initially alongside representations with counters and then on their own:<br><br>$69 \div 3$<br><br>69<br>60        9<br>$\div 3$   $\div 3$ | Whilst conceptual understanding is developing, pictorial representations can be used alongside the abstract method. Once secure in understanding, children can be presented with the abstract representation alone and use an appropriate method to solve.<br><br>$45 \div 3 = \boxed{\phantom{0}}$<br><br>$57 \div 3 = \boxed{\phantom{0}}$<br><br>$92 \div 4 = \boxed{\phantom{0}}$<br><br>$23 \div 5 = \boxed{\phantom{0}}$ remainder $\boxed{\phantom{0}}$ |

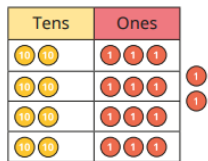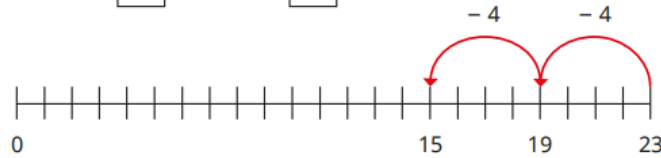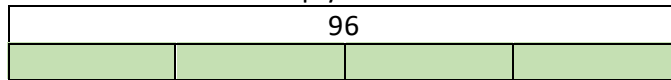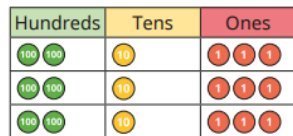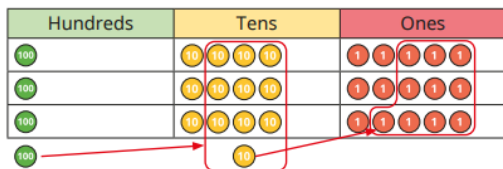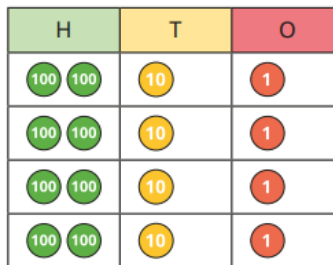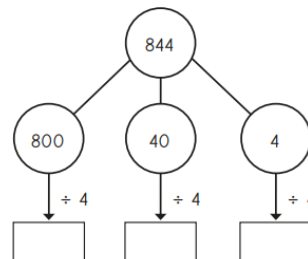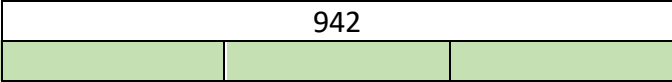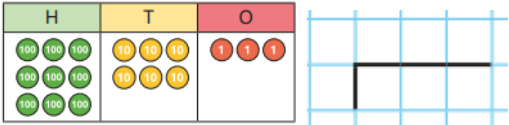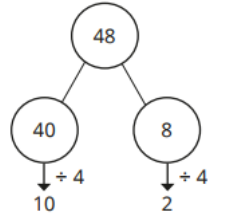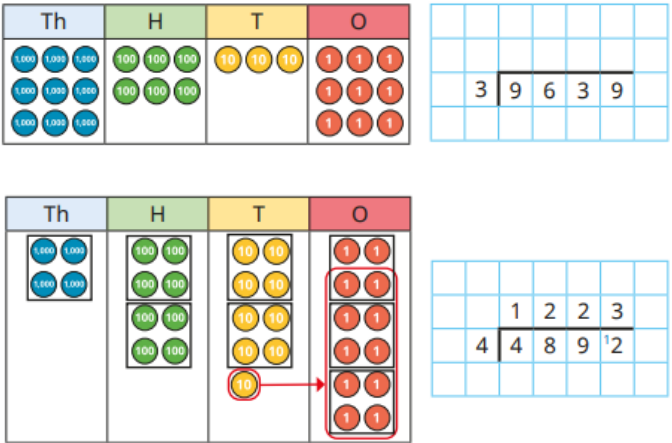| | | Counters can also be used to solve divisions with remainders: | Number lines with repeated subtraction can be used to solve divisions without and with remainders. | |
|---|---|---|---|---|
| | | Alex uses place value counters to work out $94 \div 4$<br><br>First, she shares the tens into 4 equal groups.<br><br>She needs to exchange the remaining ten for 10 ones.<br>Alex shares as many of the ones as possible into 4 equal groups.<br><br>$94 \div 4 = 23 \ r2$ | Use repeated subtraction to complete the divisions.<br><br>Use the number lines to help you.<br><br>a) $23 \div 4 =$ ☐ remainder ☐<br><br>$-4$   $-4$<br><br>0                 15      19    23<br><br>Use the bar model to help you solve $96 \div 4$<br><br>96 | |
| 4 | Divide a 3-digit number by 1 digit. | Counters are used for divisions without exchanges initially:<br><br>$639 \div 3 = 213$<br><br>Counters can also be used to solve divisions with exchanges:<br><br>$435 \div 3 = 145$ | Place value charts with equal groups:<br><br>$844 \div 4 = 211$<br><br>| H | T | O |<br><br>Part whole model to partition and divide:<br><br>844<br>800   40   4<br>$\div 4$  $\div 4$  $\div 4$ | Whilst conceptual understanding is developing, pictorial representations can be used alongside the abstract method. Once secure in understanding, children can be presented with the abstract representation alone and use an appropriate method to solve.<br><br>$525 \div 5 =$ ☐ |
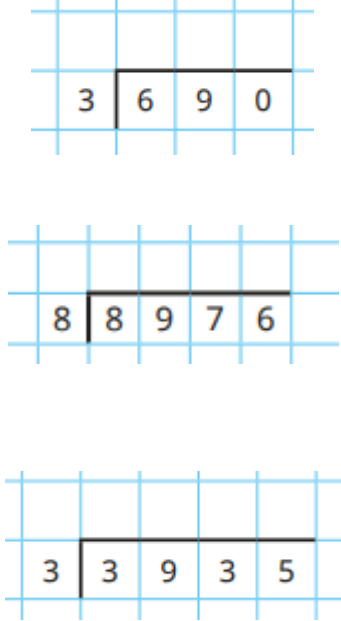
Division

Use the bar model to help you solve 942 ÷ 3

| 942 | | |
|---|---|---|
| | | |

| 5 | Short division | Counters can be used alongside the abstract method:  | The part whole model can be used alongside short division to explore similarities and differences between the two:  10 + 2 = 12, so 48 ÷ 4 = 12 Place value and counters can be used alongside the formal method, without and with exchanges and divisions with remainders:  |  |

| Th | H | T | O |
|---|---|---|---|

|   |   | 1 | 2 | 2 | 3 | r2 |
|---|---|---|---|---|---|---|
| 4 |   | 4 | 8 | 9 | ¹4 |   |

| 6 | Long division | | | |
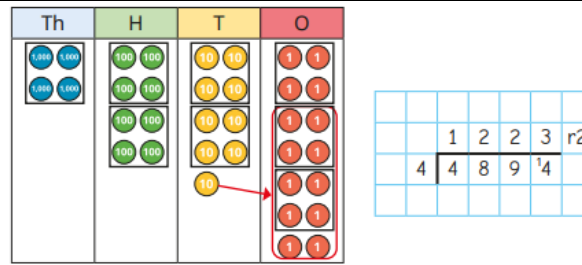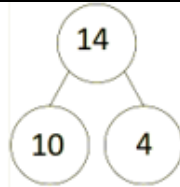
14 can be partitioned into 1 ten and 4 ones.

14 → 10, 4

Show partitioning using part whole models to support the working out of multiples:

10 + 4 = 14
20 + 8 = 28
30 + 12 = 42
40 + 16 = 56
50 + 20 = 70
60 + 24 = 84
70 + 28 = 98
80 + 32 = 112
90 + 36 = 126

Break down into stages:

|   |   | 0 | 3 | 5 |
|---|---|---|---|---|
| 1 3 | 4 | 5 | 5 |
|   | - | 3 | 9 |
|   |   | 6 | 5 |
|   |   | 6 | 5 |
|   |   | 0 |

10 + 3 = 13
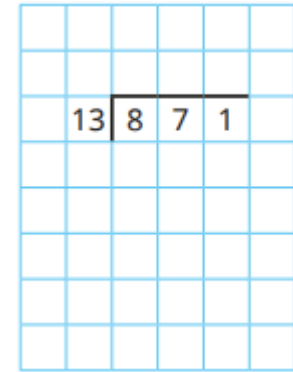20 + 6 = 26
30 + 9 = 39
40 + 12 = 52
50 + 15 = 65

1. Divide
2. Multiples
3. Subtract
4. Bring the next digit down.

13 | 8 7 1

Division

| NB | Be mindful that concrete and pictorial representation will continue to support conceptual understanding at all stages of learning and are good for retrieval. Some learners in higher year groups will still need to use concrete resources and pictorial representations so adaptive practice will be needed to ensure all children can access the learning in all lessons. |