# WILDRIDINGS CALCULATION POLICY

## Multiplication and Division
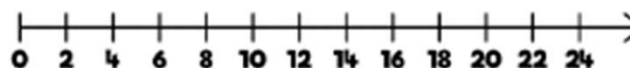
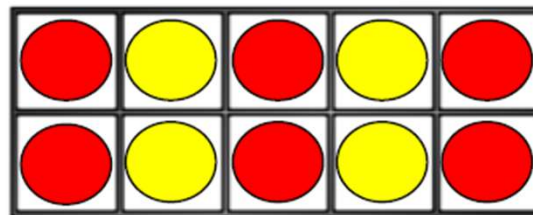# TIMES TABLES

- Encourage daily counting in multiples both forwards and backwards. This can be support using a number line, counting stick or hundred square.

- Look for patterns in the two times table, using concrete manipulatives to support. Notice how all the numbers are even and there is a pattern in the ones.

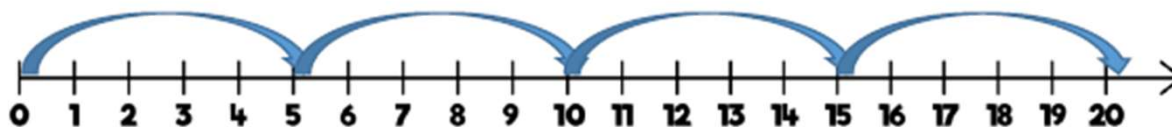- Use different models to develop fluency.

| Skill: 5 times table | Year: 1/2 |
|---|---|
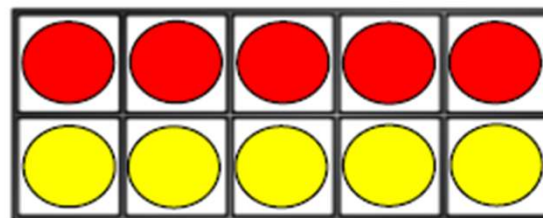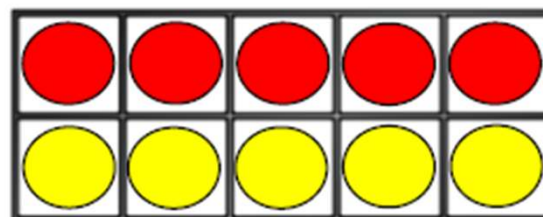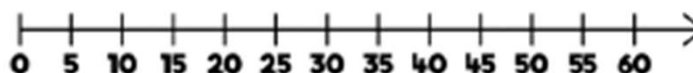


- Encourage daily counting in multiples both forwards and backwards. This can be support using a number line, counting stick or hundred square.

- Look for patterns in the five times table, using concrete manipulatives to support. Notice the pattern in the ones as well as highlighting the odd, even, odd, even pattern.

| Skill: 10 times table | Year: 1/2 |
|---|---|



- Encourage daily counting in multiples both forwards and backwards. This can be support using a number line, counting stick or hundred square.

- Look for patterns in the ten times table, using concrete manipulatives to support. Notice the patterns in the digits – the ones are always 0 and the tens increase by 1 each time.
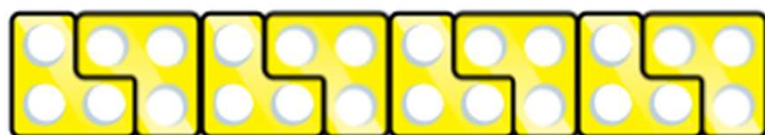
| 1 | 2 | ③ | 4 | 5 | ⑥ | 7 | 8 | ⑨ | 10 |
|---|---|---|---|---|---|---|---|---|---|
| 11 | ⑫ | 13 | 14 | ⑮ | 16 | 17 | ⑱ | 19 | 20 |
| ㉑ | 22 | 23 | ㉔ | 25 | 26 | ㉗ | 28 | 29 | ㉚ |
| 31 | 32 | ㉝ | 34 | 35 | ㊱ | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |

3   6   9   12
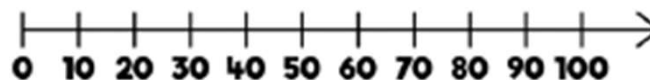
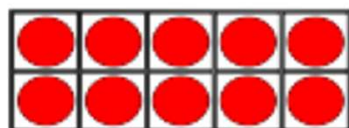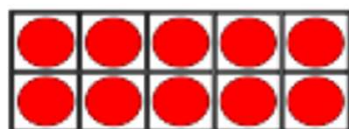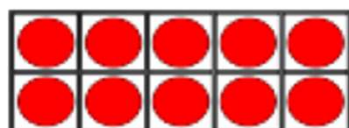0   3   6   9   12   15   18   21   24   27   30   33   36
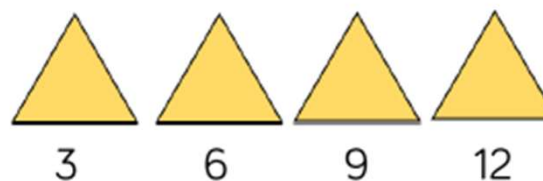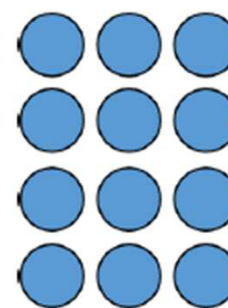
- Encourage daily counting in multiples both forwards and backwards. This can be support using a number line, counting stick or hundred square.

- Look for patterns in the two times table, using concrete manipulatives to support. Notice the odd, even, odd, even pattern using number shapes to support. Highlight the pattern in the ones using a hundred square.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |

| 4 | 8 | 12 | 16 | 20 |
|---|---|---|---|---|
| 24 | 28 | 32 | 36 | 40 |
| 44 | 48 | 52 | 56 | 60 |
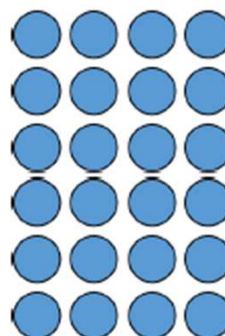
4    8    12    16
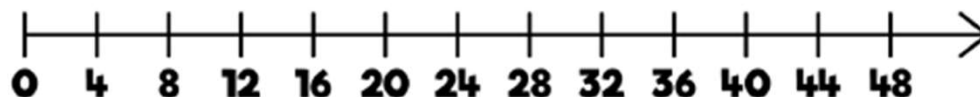
0  4  8  12  16  20  24  28  32  36  40  44  48

- Encourage daily counting in multiples both forwards and backwards. This can be support using a number line, counting stick or hundred square.

- Look for patterns in the four times table, using manipulatives to support. Make links to the 2 times table seeing how each multiple is double the twos. Notice the pattern in the ones within each group of five multiples. Highlight that all the multiples are even using number shapes to support.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

8    16    24    32

| 8 | 16 | 24 | 32 | 40 |
|---|---|---|---|---|
| 48 | 56 | 64 | 72 | 80 |

0  8  16  24  32  40  48  56  64  72  80  88  96

- Encourage daily counting in multiples both forwards and backwards. This can be support using a number line, counting stick or hundred square.

- Look for patterns in the eight times table, using manipulatives to support. Make links to the 4 times table seeing how each multiple is double the fours. Notice the pattern in the ones within each group of five multiples. Highlight that all the multiples are even using number shapes to support.

| 6 | 12 | 18 | 24 | 30 |
|---|----|----|----|----|
| 36 | 42 | 48 | 54 | 60 |
| 66 | 72 | 78 | 84 | 90 |

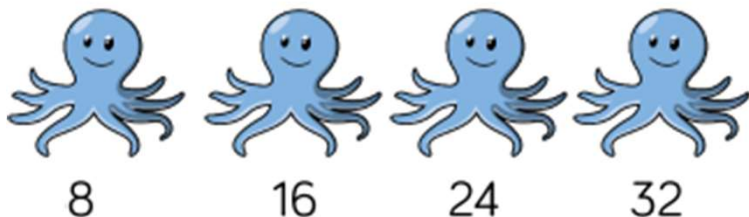| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|----|
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

0  6  12  18  24  30  36  42  48  54  60  66  72
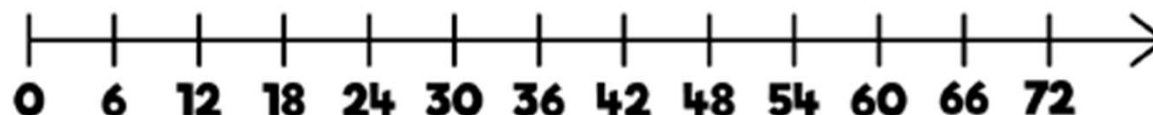
- Encourage daily counting in multiples both forwards and backwards. This can be support using a number line, counting stick or hundred square.

- Look for patterns in the six times table, using manipulatives to support. Make links to the 3 times table seeing how each multiple is double the threes. Notice the pattern in the ones within each group of five multiples. Highlight that all the multiples are even using number shapes to support.

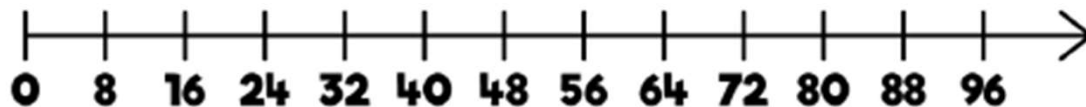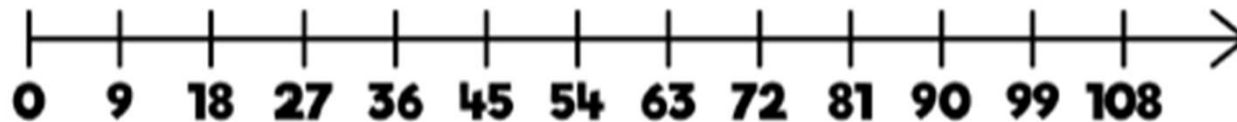| 9 | 18 | 27 | 36 | 45 |
|---|----|----|----|----|
| 54 | 63 | 72 | 81 | 90 |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|----|
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

0  9  18  27  36  45  54  63  72  81  90  99  108

- Encourage daily counting in multiples both forwards and backwards. This can be support using a number line, counting stick or hundred square.

- Look for patterns in the nine times table, using manipulatives to support. Notice the pattern in the tens and ones using the hundred square to support as well as noting the odd, even pattern within the multiples.
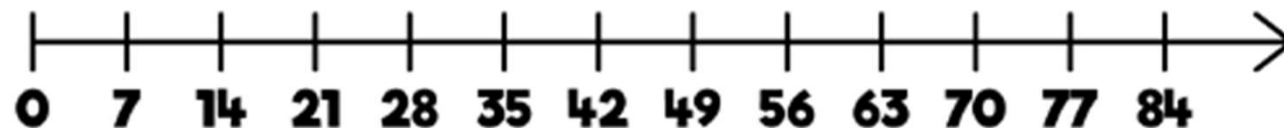
| 7 | 14 | 21 | 28 | 35 |
|---|----|----|----|----|
| 42 | 49 | 56 | 63 | 70 |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|----|
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

0  7  14  21  28  35  42  49  56  63  70  77  84

- Encourage daily counting in multiples both forwards and backwards. This can be support using a number line, counting stick or hundred square.

- The seven times table can be trickier to learn due to the lack of obvious pattern in the numbers, however they already know several facts due to commutativity. Children can still see the odd, even pattern in the multiples using number shapes to support.
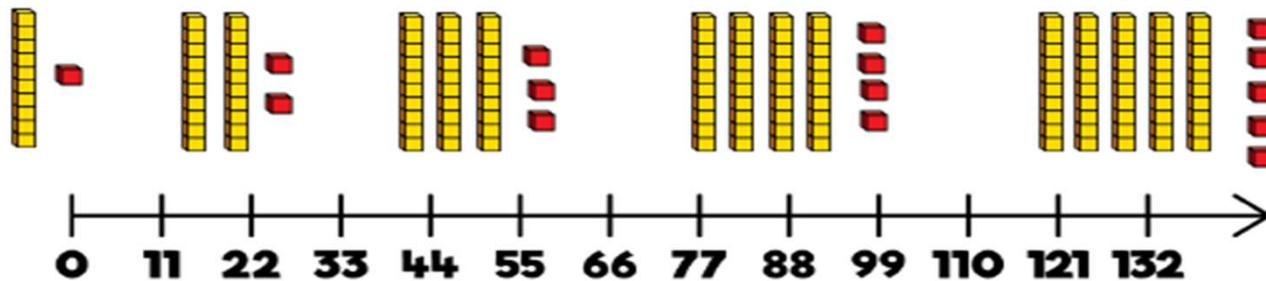
| 11 | 22 | 33 | 44 | 55 | 66 |
|----|----|----|-----|-----|-----|
| 77 | 88 | 99 | 110 | 121 | 132 |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----|----|----|----|----|----|----|----|----|-----|
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

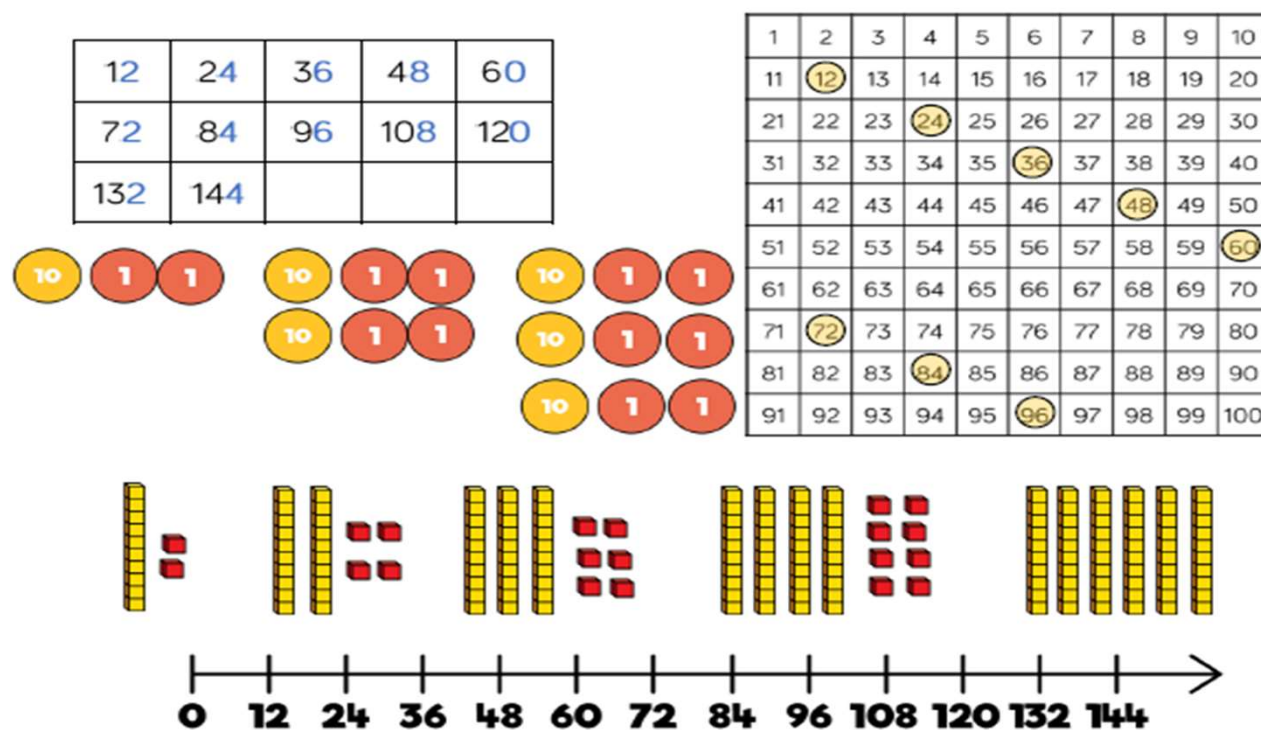0   11   22   33   44   55   66   77   88   99   110   121   132

- Encourage daily counting in multiples both forwards and backwards. This can be support using a number line, counting stick or hundred square.

- Look for patterns in the eleven times table, using manipulatives to support. Notice the pattern in the tens and ones using the hundred square to support. Also consider the pattern after crossing 100.

| 12 | 24 | 36 | 48 | 60 |
|-----|-----|-----|------|------|
| 72 | 84 | 96 | 108 | 120 |
| 132 | 144 | | | |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----|----|----|----|----|----|----|----|----|-----|
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

0   12   24   36   48   60   72   84   96   108   120   132   144

- Encourage daily counting in multiples both forwards and backwards. This can be support using a number line, counting stick or hundred square.

- Look for patterns in the twelve times table, using manipulatives to support. Make links to the 6 times table seeing how each multiple is double the sixes. Notice the pattern in the ones within each group of five multiples. The hundred square can support in highlighting this pattern.
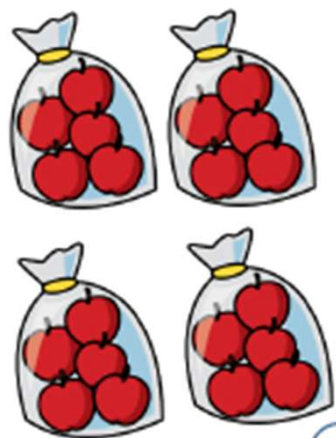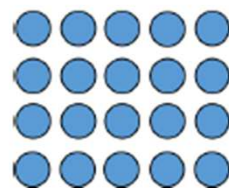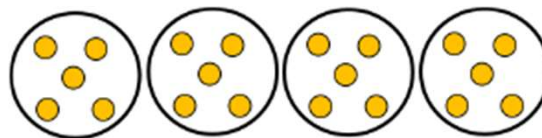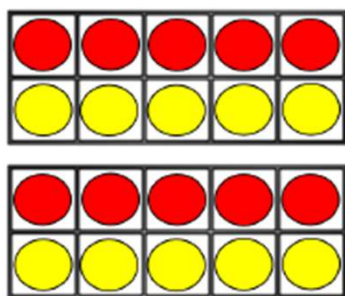
# MULTIPLICATION

| | Skill: Solve 1-step problems using multiplication | Year: 1/2 |
|---|---|---|

One bag holds 5 apples.
How many apples do 4 bags hold?

$5 + 5 + 5 + 5 = 20$

$4 \times 5 = 20$

$5 \times 4 = 20$

- Children represent multiplication as repeated addition in many different ways.

- In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record multiplication formally.

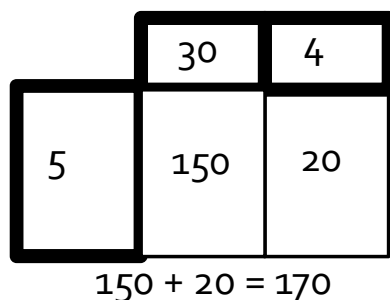- In Year 2, children are introduced to the multiplication symbol.

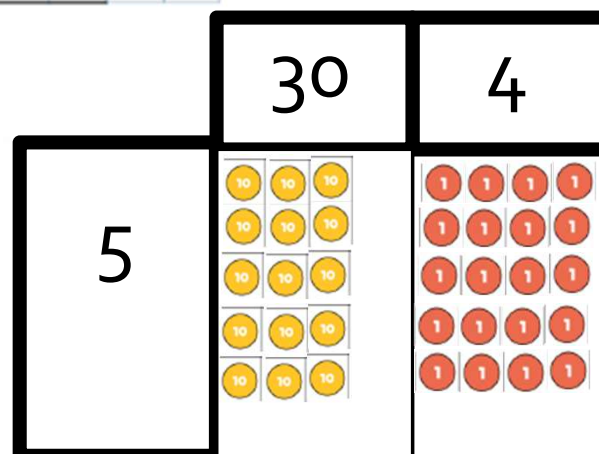| | |
|---|---|
| **Skill: Multiply 2-digit numbers by 1-digit numbers** | **Year: 3/4** |

| Hundreds | Tens | Ones |
|---|---|---|
| | | |
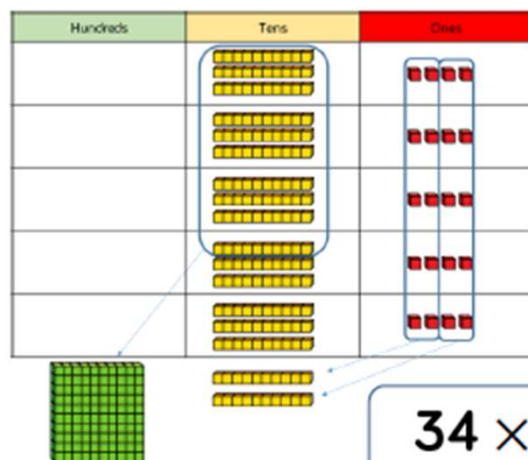
$$34 \times 5 = 170$$

| | H | T | O | |
|---|---|---|---|---|
| | | 3 | 4 | |
| × | | | 5 | |
| | | 2 | 0 | (5 × 4) |
| + | 1 | 5 | 0 | (5 × 30) |
| | 1 | 7 | 0 | |

| | 30 | 4 |
|---|---|---|
| 5 | 150 | 20 |

150 + 20 = 170

| | 30 | 4 |
|---|---|---|
| 5 | | |

- In Year 3, children start by using arrays before moving onto the grid method to show their working out.  The place value counters can be used to support the understanding of the method rather than the multiplication, as children should be using their times tables knowledge.

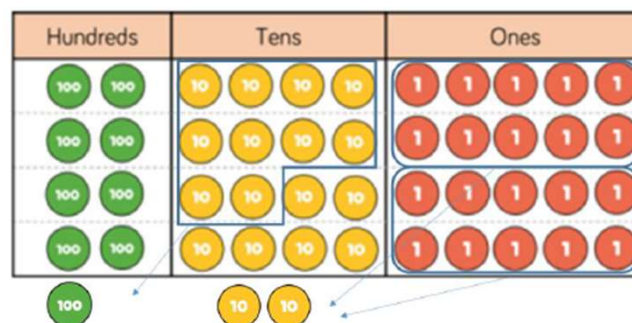- In Year 4, the children move onto the expanded column method.

| | Skill: multiply 3-digit numbers by 1-digit numbers | Year: 4 |
|---|---|---|



$$245 \times 4 = 980$$
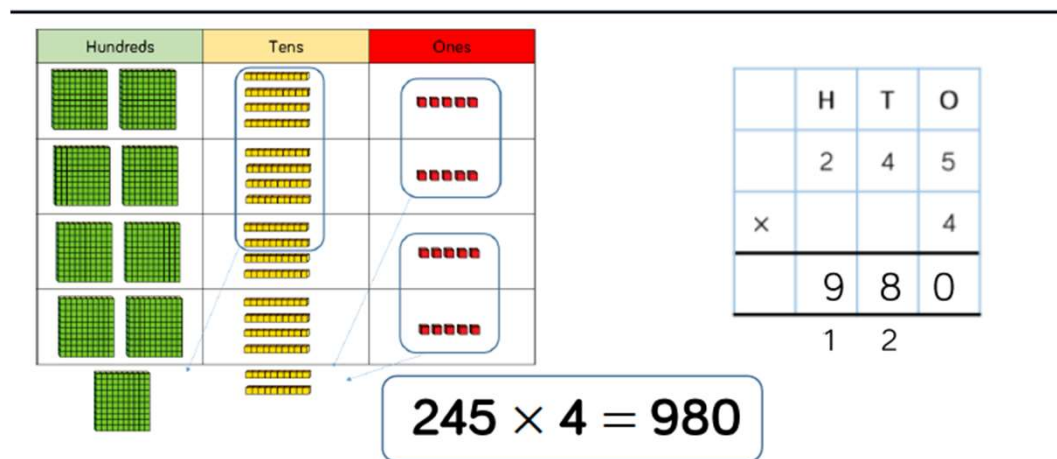
```
  2 4 5
X     4
  2 0    (5x4)
1 6 0    (40x4)
+8 0 0   (200x4)
  9 8 0
```

| | H | T | O |
|---|---|---|---|
| | 2 | 4 | 5 |
| × | | | 4 |
| | 9 | 8 | 0 |
| | | 1 | 2 |

- Start by using the expanded column method before moving onto the short, formal written method.

- Base 10 and place value counters continue to support the understanding of the written method. Limit the number of exchanges needed in the questions and move children away from resources when multiplying larger numbers.

| | |
|---|---|
| **Skill: Multiply 4-digit numbers by 1-digit numbers** | **Year: 5** |
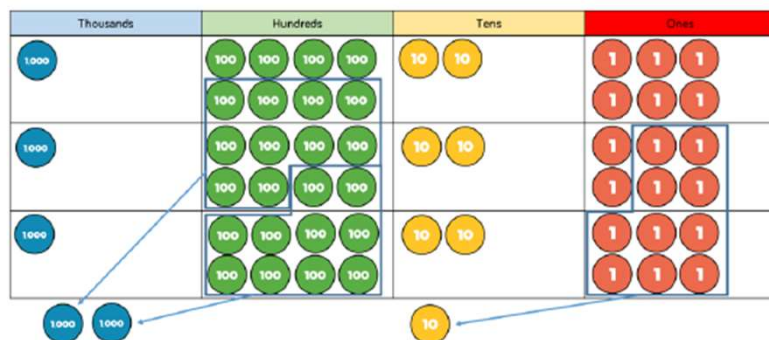


1,826 × 3 = 5,478

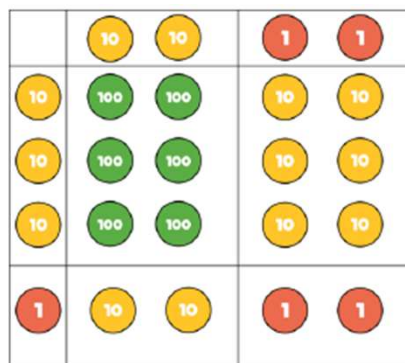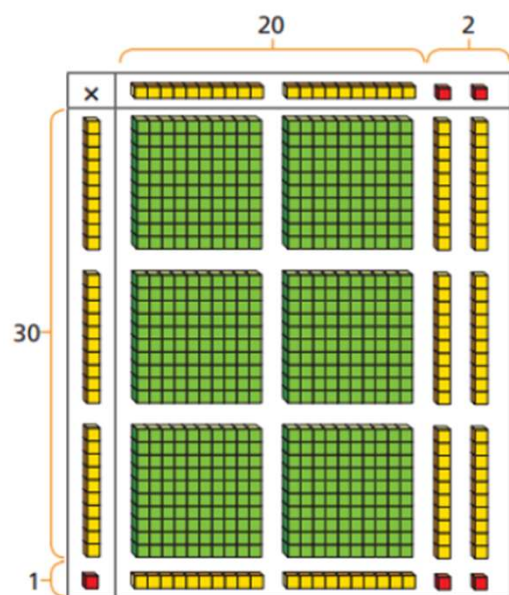| | Th | H | T | O |
|---|---|---|---|---|
| | 1 | 8 | 2 | 6 |
| × | | | | 3 |
| | 5 | 4 | 7 | 8 |
| | | 2 | | 1 |

- When multiplying 4-digit numbers, place value counters are the best manipulative to use to support children in their understanding of the formal written method. If children are multiplying larger numbers and struggling with their times tables, encourage the use of multiplication grids so the children can focus on the use of the written method.

| | | |
|---|---|---|
| **Skill: Multiply 2-digit numbers by 2-digit numbers** | | **Year: 5** |



| × | 20 | 2 |
|---|---|---|
| 30 | 600 | 60 |
| 1 | 20 | 2 |

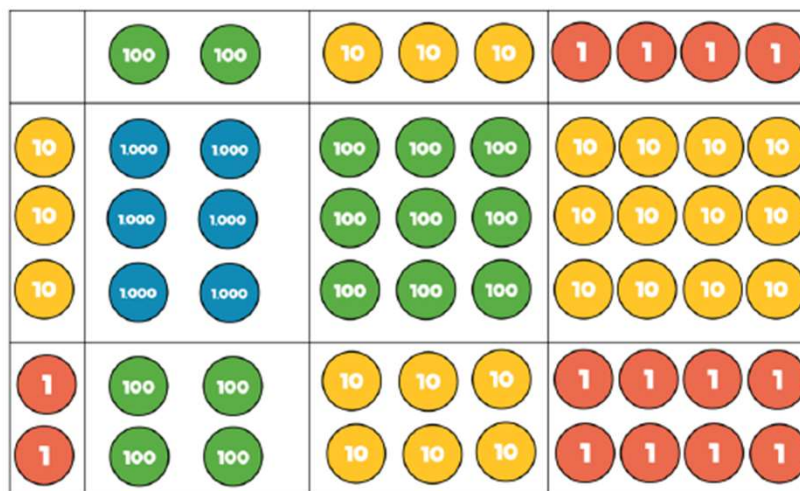| | H | T | O |
|---|---|---|---|
| | | 2 | 2 |
| × | | 3 | 1 |
| | | 2 | 2 |
| | 6 | 6 | 0 |
| | 6 | 8 | 2 |

$22 \times 31 = 682$

- When multiplying a multi-digit number by 2-digits, use the area model to help children understand the size of the numbers they are using. This links to finding the area of a rectangle by finding the space covered by the base 10. The grid method matches the area model as an initial written method before moving on to the formal written multiplication method.

| | | | |
|---|---|---|---|
| Skill: Multiply 3-digit numbers by 2-digit numbers | | | Year: 5/6 |



$$234 \times 32 = 7{,}488$$

| Th | H | T | O |
|---|---|---|---|
| | 2 | 3 | 4 |
| × | | 3 | 2 |
| | 4 | 6 | 8 |
| 1 7 | 1 0 | 2 | 0 |
| 7 | 4 | 8 | 8 |

| × | 200 | 30 | 4 |
|---|---|---|---|
| 30 | 6,000 | 900 | 120 |
| 2 | 400 | 60 | 8 |

- Children can continue to use the area model when multiplying 3-digit numbers by 2-digits. Place value counters become more efficient to use but Base 10 can be used to highlight the size of the numbers.

- Encourage children to move towards the formal written method, seeing the links with the grid method.

| | Skill: Multiply 4-digit numbers by 2-digit numbers | Year: 5/6 |

**Skill: Multiply 4-digit numbers by 2-digit numbers**

**Year: 5/6**

| TTh | Th | H | T | O |
|---|---|---|---|---|
| | 2 | 7 | 3 | 9 |
| × | | | 2 | 8 |
| 2²| 1⁵ | 9³ | 1⁷ | 2 |
| 5 | 4 | 7¹ | 8 | 0 |
| 1 | | | | |
| 7 | 6 | 6 | 9 | 2 |
| | | | 1 | |

$2,739 \times 28 = 76,692$

- When multiplying 4-digits by 2-digits, children should be confident in written method.

- If they are still struggling with the times tables, provide multiplication grids to support when they are focusing on the use of the method.

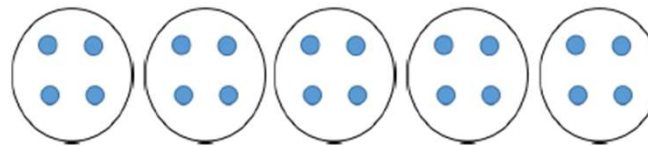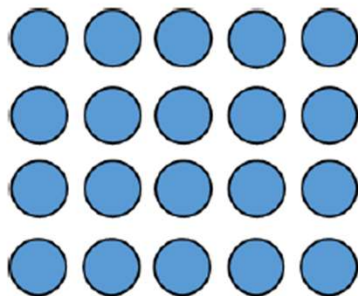- Consider where exchanged digits are placed and make sure this is consistent.

# DIVISION

| **Skill: Solve 1-step problems using division (sharing)** | **Year: 1/2** |
|---|---|

20

? ? ? ? ?
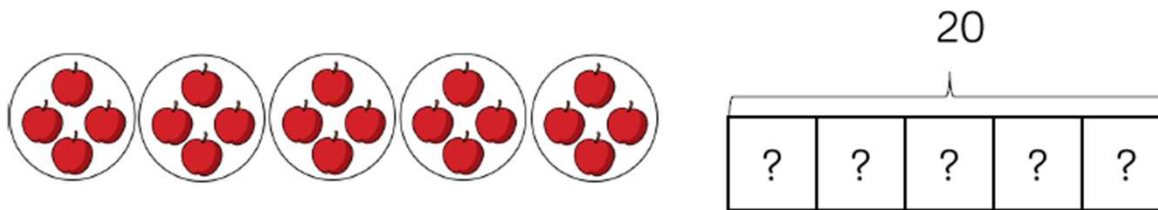
There are 20 apples altogether.
They are shared equally between 5 bags.
How many apples are in each bag?
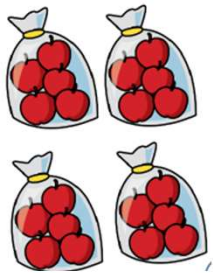
$20 \div 5 = 4$

- Children solve problems by sharing amounts into equal groups.

- In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record division formally.

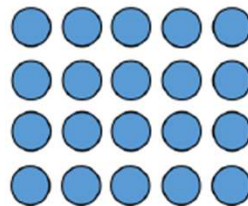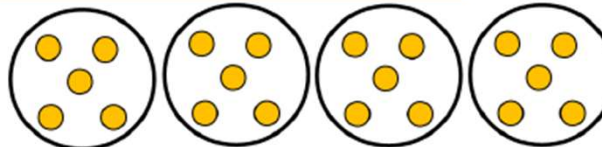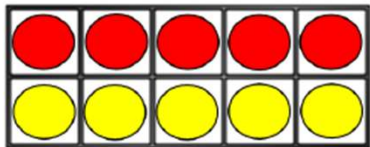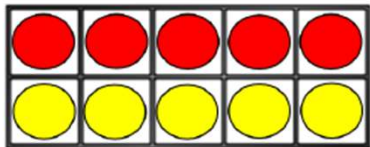- In Year 2, children are introduced to the division suymbol.

| Skill: Solve 1-step problems using division (grouping) | Year: 1/2 |
|---|---|



There are 20 apples altogether.
They are put in bags of 5.
How many bags are there?

$20 \div 5 = 4$

- Children solve problems by grouping and counting the number of groups. Grouping encourages children to count in multiples and links to repeated subtraction on a number line. They can use concrete representations in fixed groups such as number shapes which helps to show the link between multiplication and division.
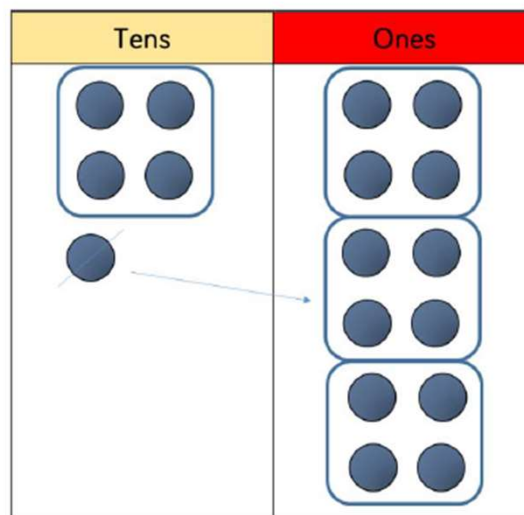
| Skill: Divide 2-digits by 1 digits (grouping) | Year: 3 |
|---|---|



Tens | Ones
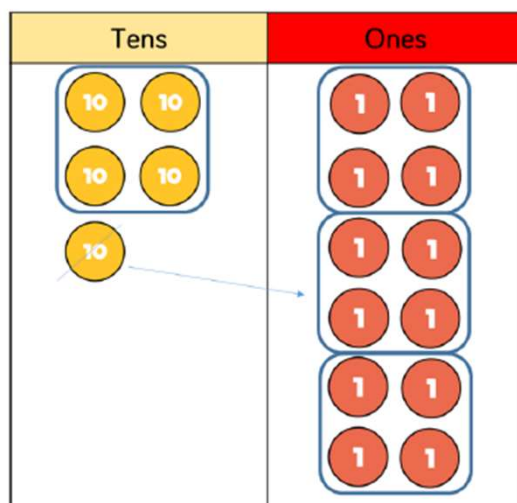
52 ÷ 4 = 13

1 3
4 | 5 ¹2

52
? | ? | ? | ?

- When using the short division method, children use grouping. Starting with the largest place value, they group by the divisior.

- Language is important here. Children should consider 'How many groups of 4 tens can we make?' and 'How many groups of 4 ones can we make?'

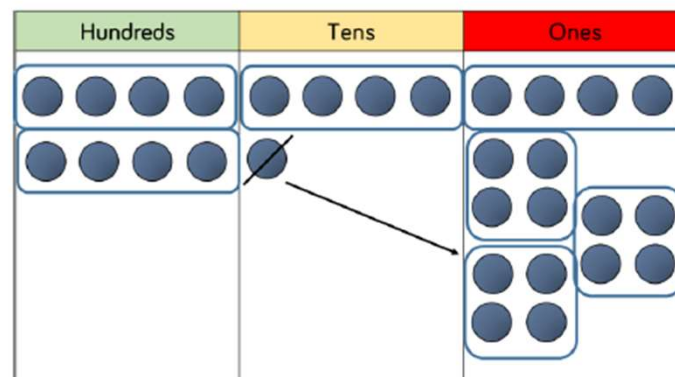- Remainders can also be seen as they are left ungrouped.

| Skill: Divide 3-digits by 1 digits (grouping) | Year: 4/5 |
|---|---|



856

| ? | ? | ? | ? |
|---|---|---|---|
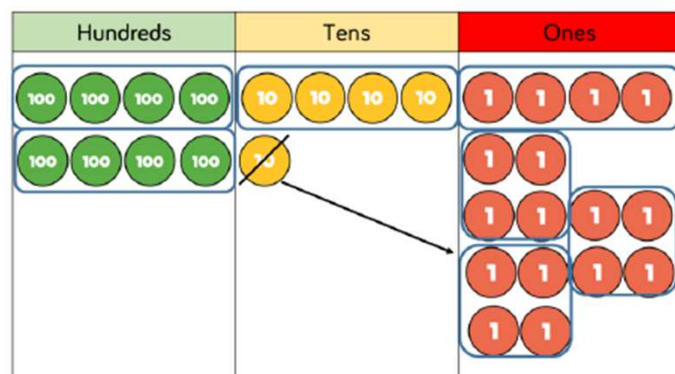
214 ÷ 4 | 8 5 ¹6

856 ÷ 4 = 214

- Children can continue to use grouping to support their understanding of short division when dividing a 3-digit number by a 1-digit number.

- Place value counters of plain counters can be used on a place value grid to support this understanding. Children can also draw their own counters and group then through a more pictorial method.

| | Skill: Divide 4-digits by 1-digit (grouping) | Year: 5 |
|---|---|---|
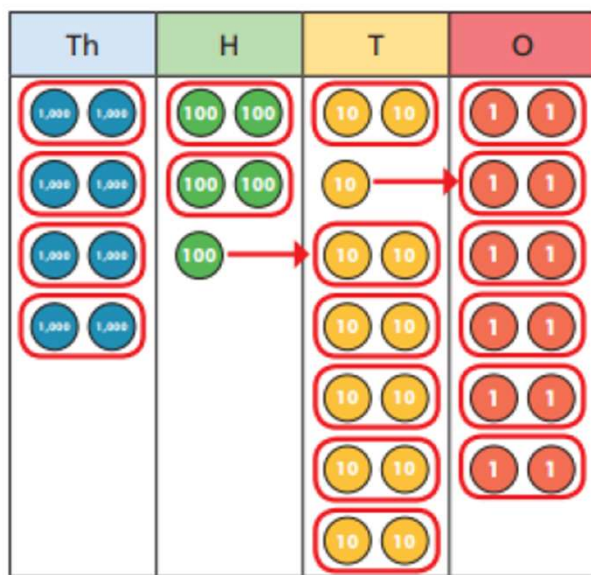


$$8{,}532 \div 2 = 4{,}266$$

- Place value counters or plain counters can be used on a place value grid to support children to divide 4-digits by 1-digit. Children can also draw their own counters and group them through a more pictorial method.

- Children should be encouraged to move away from the concrete and pictorial when dividing numbers with multiple exchanges.

| | | 0 | 3 | 6 |
|---|---|---|---|---|
| | 12 | 4 | $4_3$ | $7_2$ |

$$432 \div 12 = 36$$

$$7,335 \div 15 = 489$$

| | | 0 | 4 | 8 | 9 |
|---|---|---|---|---|---|
| | 15 | 7 | $7_3$ | $13_3$ | $13_5$ |

| 15 | 30 | 45 | 60 | 75 | 90 | 105 | 120 | 135 | 150 |
|---|---|---|---|---|---|---|---|---|---|

- When children begin to divide up to 4-digits by 2-digits, written methods become the most accurate as concrete and pictorial representations become less effective. Children can write out multiples to support their calculations with larger remainders. Children will also solve problems with remainders where their quotient can be rounded as appropriate.

| | |
|---|---|
| ![Wildridings Primary School logo] **Skill: Divide multi-digits by 2 digits (long division)** | **Year: 6** |



$$12 \times 1 = 12$$
$$12 \times 2 = 24$$
$$12 \times 3 = 36$$
$$12 \times 4 = 48$$
$$12 \times 5 = 60$$
$$12 \times 6 = 72$$
$$12 \times 7 = 84$$
$$12 \times 8 = 96$$
$$12 \times 7 = 108$$
$$12 \times 10 = 120$$

$$432 \div 12 = 36$$

$$7,335 \div 15 = 489$$

$$1 \times 15 = 15$$
$$2 \times 15 = 30$$
$$3 \times 15 = 45$$
$$4 \times 15 = 60$$
$$5 \times 15 = 75$$
$$10 \times 15 = 150$$

- Children can also divide by 2-digit numbers using long division.

- Children can write out multiples to support their calculations with larger remainders.

- Children will also solve problems with remainders where the quotient can be rounded as appropriate.

| | | | | |
|---|---|---|---|---|

**Skill: Divide multi-digits by 2 digits (long division)** | **Year: 6**



$372 \div 15 = 24 \ r12$

$372 \div 15 = 24\frac{4}{5}$

$1 \times 15 = 15$
$2 \times 15 = 30$
$3 \times 15 = 45$
$4 \times 15 = 60$
$5 \times 15 = 75$
$10 \times 15 = 150$

- When a remainder is left at the end of a calculation, children can either leave it as a remainder or convert it to a fraction. This will depend on the context of the questions.

- Children can also answer questions where the quotient needs to be rounded according to the context.

# Glossary

**Array –** An ordered collection of counters, cubes or other items in rows and columns.

**Commutative –** Numbers can be multiplied in any order.

**Dividend –** In division, the number that is divided.

**Divisor –** In division, the number by which another is divided.

**Exchange –** Change a number or expression for another of equal value.

**Factor –** A number that multiples with another to make a product.

**Multiplicand –** In multiplication, a number to be multiplied by another.

**Partitioning –** Splitting a number into its component parts.

**Product –** The result of multiplying one number by another.

**Quotient –** The result of a division.

**Remainder –** The amount left over after a division when the divisor is not a factor of the dividend.

**Scaling –** Enlarging or reducing a number a given amount, called the scale factor.