Maths at Longton Primary School Parent Workshop 2024

Aims

- To outline clear progression of the four calculation methods and how these are taught in each year group.

- To provide a range of ways to support your child at home with mathematics.
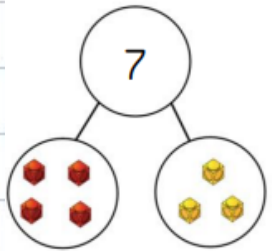
What type of Mathematics person are you?

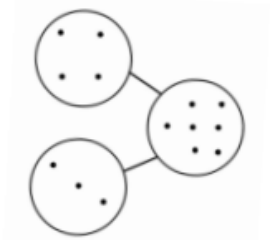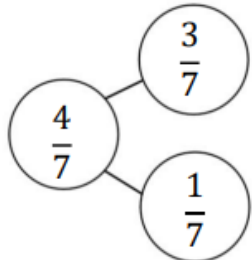Effortless
Hard worker
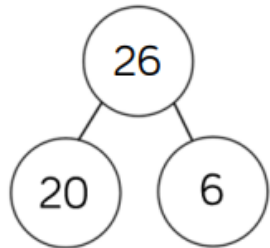Struggler
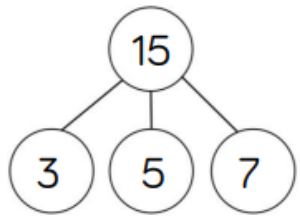Terrified

Part-Whole Model

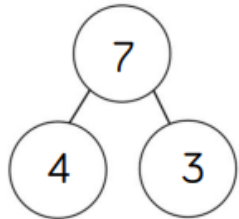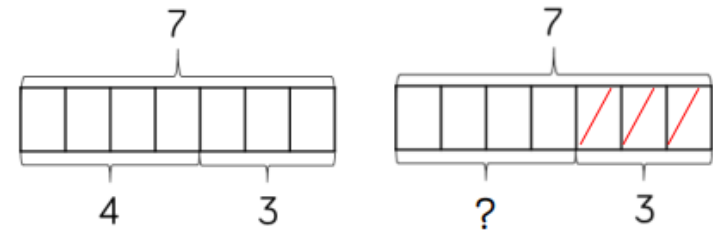

$$7 = 4 + 3$$
$$7 = 3 + 4$$

$$7 - 3 = 4$$
$$7 - 4 = 3$$

Bar Model (single)

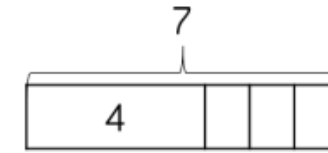**Concrete**

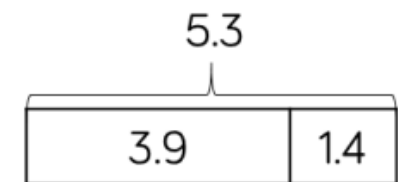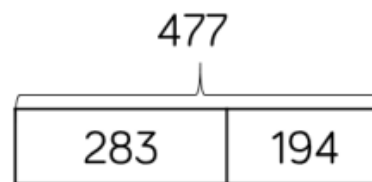**Discrete**

7

4   3

7

?   3

Combination

7

4

Continuous

?

4   3

7

?   3

477

283   194

5.3

3.9   1.4
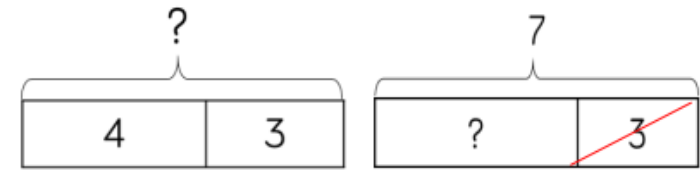
Number Shapes
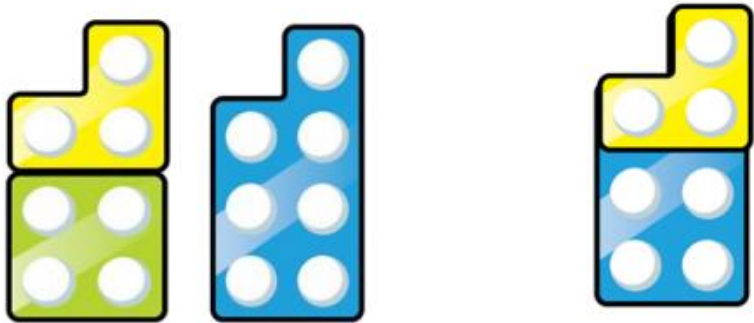
$7 = 4 + 3$ $7 = 3 + 4$ $7 - 3 = 4$
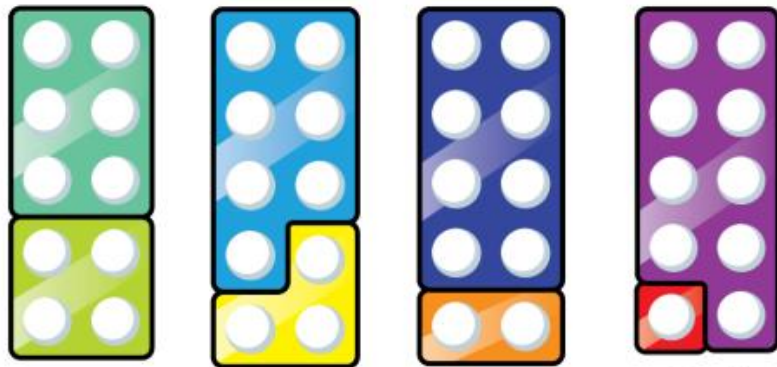
6+4   **7+3**   **8+2**   **9+1**

Cubes

$7 = 4 + 3$
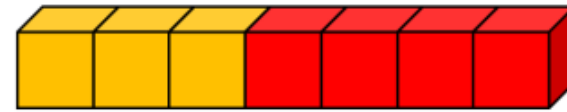
$7 = 3 + 4$
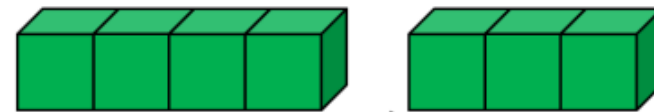
$7 - 3 = 4$
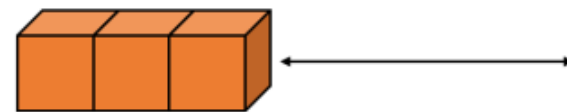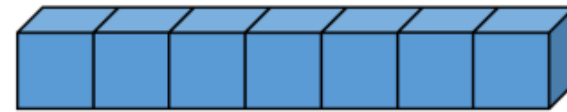
$7 - 3 = 4$

Ten Frames (within 10)
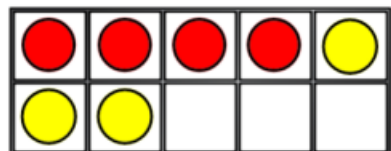
$4 + 3 = 7$ 4 is a part.
$3 + 4 = 7$ 3 is a part.
$7 - 3 = 4$ 7 is the whole.
$7 - 4 = 3$

Ten Frames (within 20)
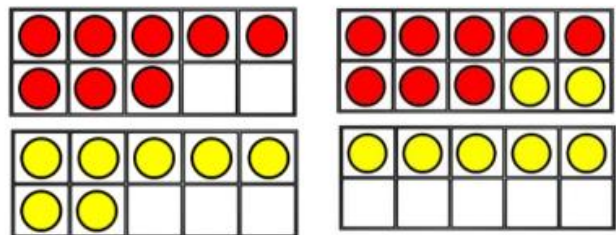
$8 + 7 = 15$

2   5

Number Tracks

$5 + 3 = 8$

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

$10 - 4 = 6$

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

$8 + 7 = 15$

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
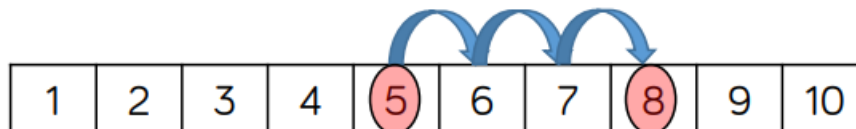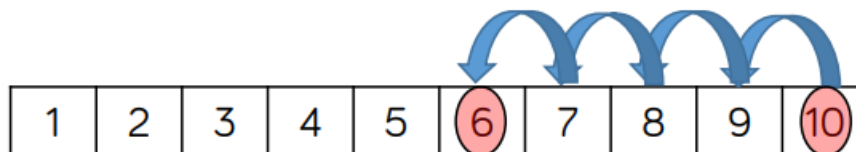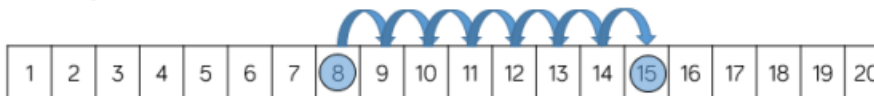
Number Lines (labelled)

$5 + 3 = 8$

$8 + 7 = 15$

$2 \quad 5$

$+2 \qquad +5$

$14 - 6 = 8$

$4 \quad 2$

$-2 \qquad -4$
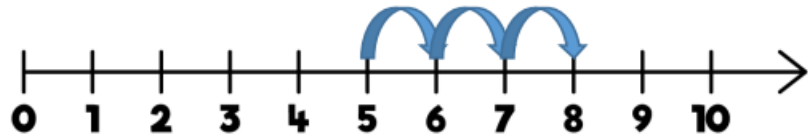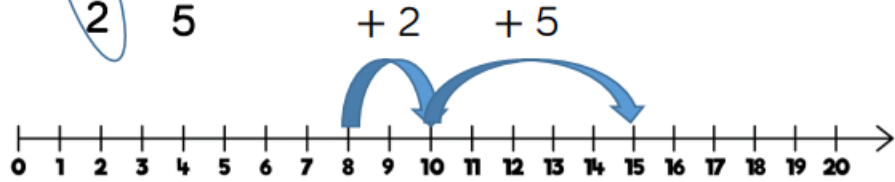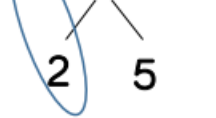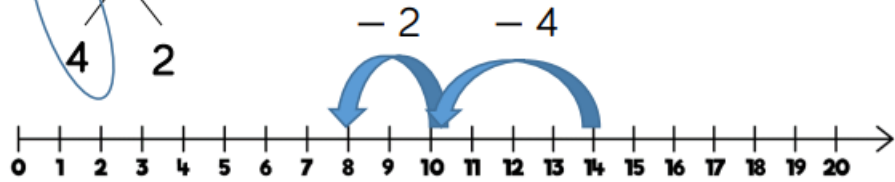
Number Lines (blank)

$35 + 37 = 72$

$+5 \qquad +30 \qquad +2$

35 \qquad 40 \qquad 70 \quad 72

$35 + 37 = 72$

$+5 \qquad +32$

35 \qquad 40 \qquad 72

$72 - 35 = 37$

$+5 \qquad +30 \qquad +2$

35 \qquad 40 \qquad 70 \quad 72
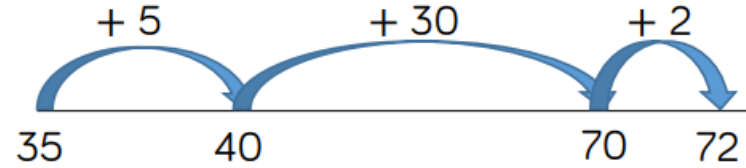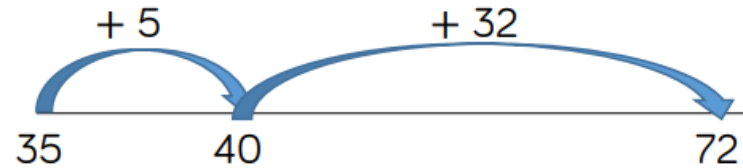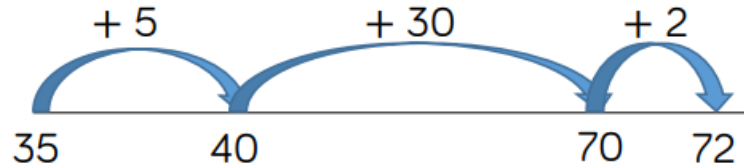
Addition

Year 1

Year 1/2

Skill: Add 1-digit numbers within 10

$$4 + 3 = 7$$

Skill: Add 1 and 2-digit numbers to 20

$$8 + 7 = 15$$

Year 2

Skill: Add three 1-digit numbers

$$7 + 6 + 3 = 16$$

$$7 + 6 + 3 = 16$$

10

16
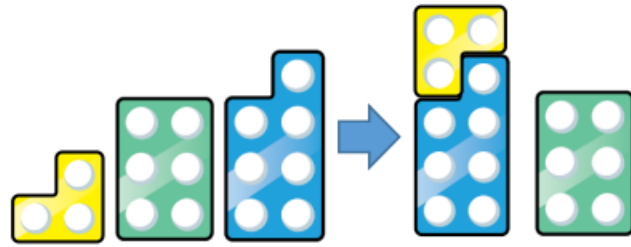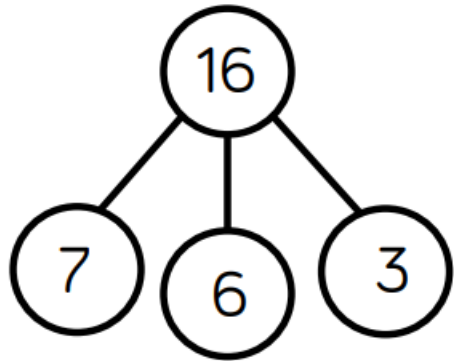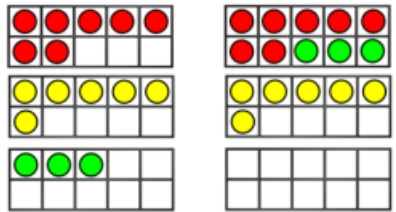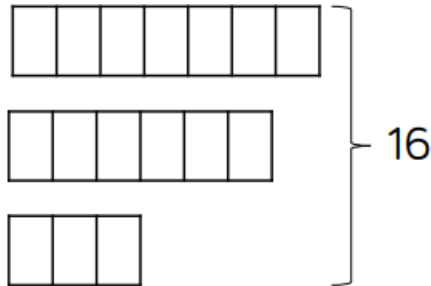
Year 2/3

Skill: Add 1-digit and 2-digit numbers to 100

35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

+2   +3

38   40   43

?

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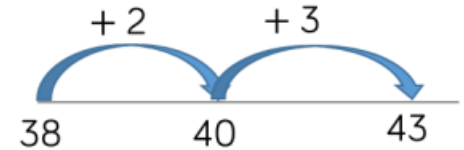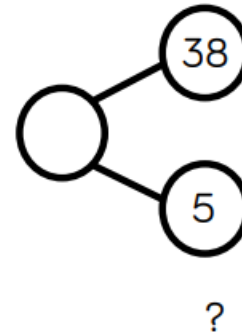
$$38 + 5 = 43$$
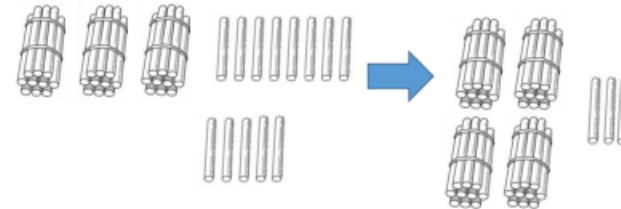
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Year 3

Skill: Add numbers with up to 3 digits

265

?

164

?

265 | 164

265
164
}?
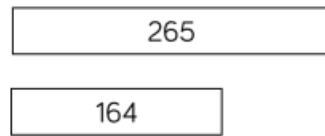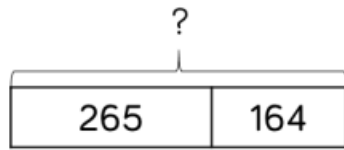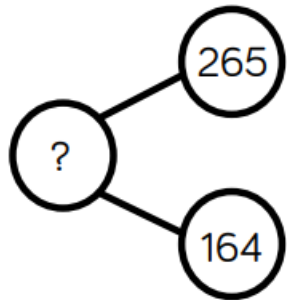
$$265 + 164 = 429$$

Hundreds	Tens	Ones

265
+ 164

429
1

Hundreds	Tens	Ones

Year 4

Skill: Add numbers with up to 4 digits

1,378

?

2,148

?

2,138 | 1,378

2,138
1,378
}?
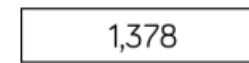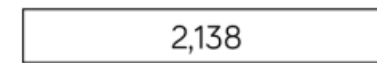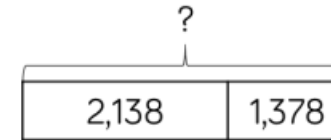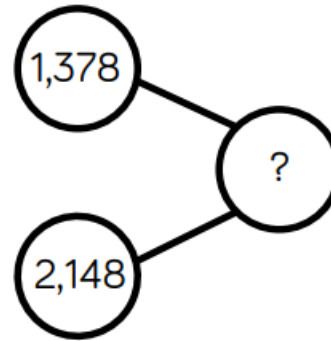
	1	3	7	8
+	2	1	4	8
	3	5	2	6
			1	1

$$1,378 + 2,148 = 3,526$$

Thousands	Hundreds	Tens	Ones

Thousands	Hundreds	Tens	Ones

Year 5 and 6

Skill: Add with up to 3 decimal places
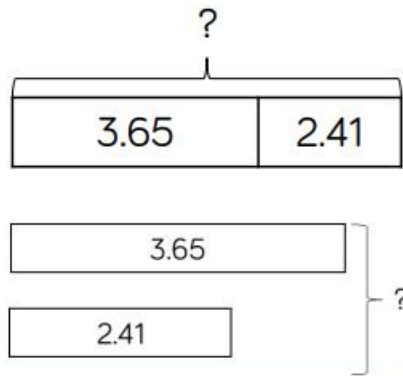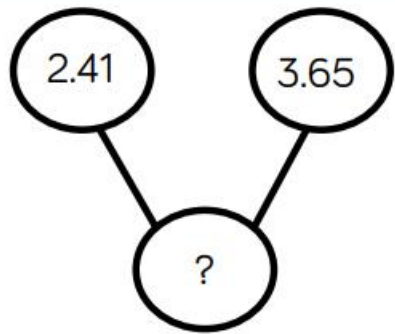
$$3.65 + 2.41 = 6.06$$
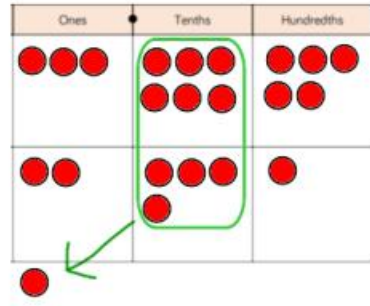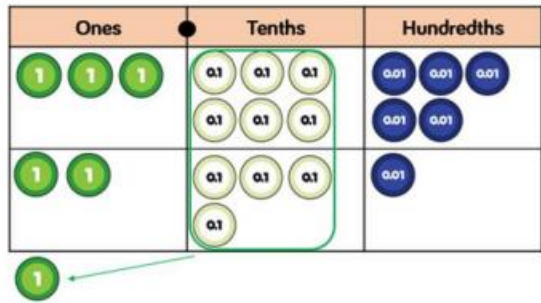
Skill: Add numbers with more than 4 digits
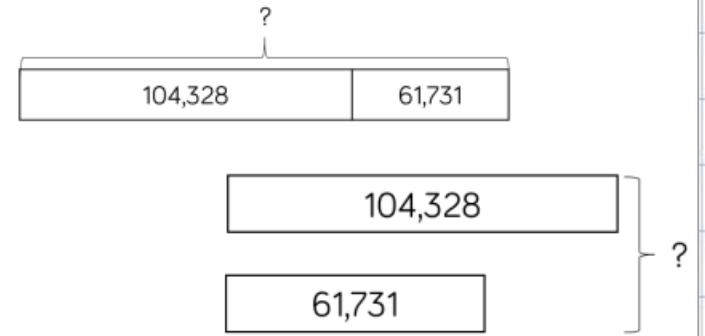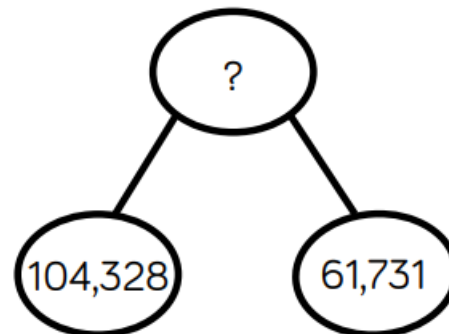
$$104,328 + 61,731 = 166,059$$

101 and Out

Players   2

Materials: 1 die, scratch paper

How to Play: Copy the game board below. Roll the die six times. Each roll has to count. You can count the rolls as either ones or tens. Keep a running total as you play. The closest to 101 *without going over* wins.

1	1 or 10	4	4 or 40
2	2 or 20	5	5 or 50
3	3 or 30	6	6 or 60

Player 1

10   +   50   + 4 +   20   +   4   +   3 =

Total __91__

Player 2

50   +   6   +   10   + 30   + 2   +   4 =

Total 102 so out   Player 1 wins!

Subtraction

Year 1

Year 1/2

Skill: Subtract 1-digit numbers within 10

$7 - 3 = 4$

First   Then   Now

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
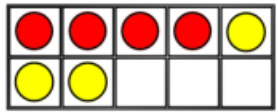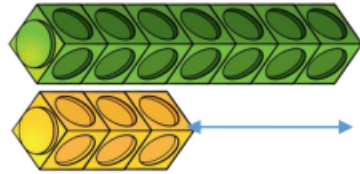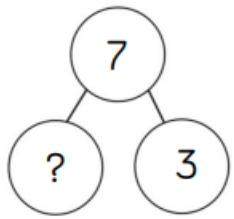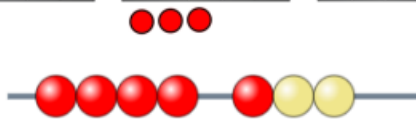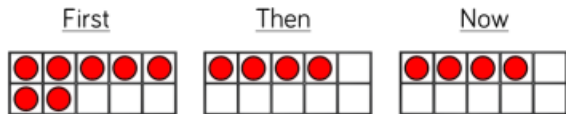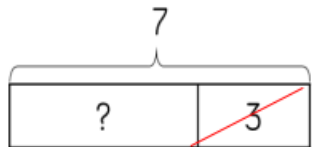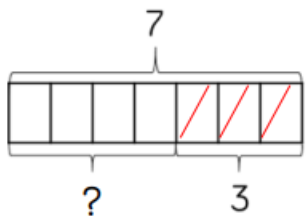
Skill: Subtract 1 and 2-digit numbers to 20

$14 - 6 = 8$

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

$14 - 6 = 8$
4   2

-2 -4

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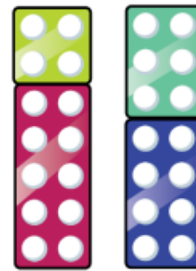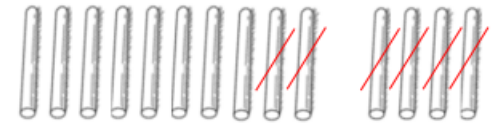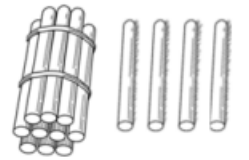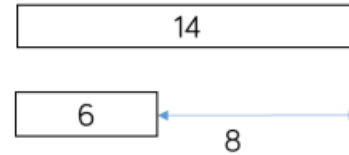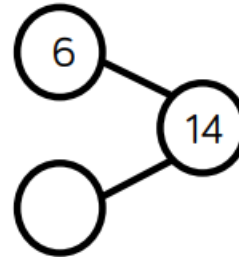
$14 - 6 = 8$
4   2
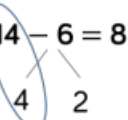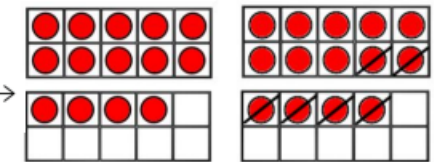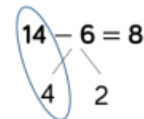
Year 2/3

Year 3

Skill: Subtract 1 and 2-digit numbers to 100

65
28

+ 2   + 30   + 5
28   30   60   65

65
? | 28

65 − 28 = 37

Tens	Ones

$^5\!6^1\!5$
− 28
37

Tens	Ones

Skill: Subtract numbers with up to 3 digits

435
273   ?

435
273 | ?

435
273   ?

435 − 273 = 162

Hundreds	Tens	Ones

$^3\!4^1\!35$
− 273
162

Hundreds	Tens	Ones

Year 4

Skill: Subtract numbers with up to 4 digits

4,357

2,735 → ?
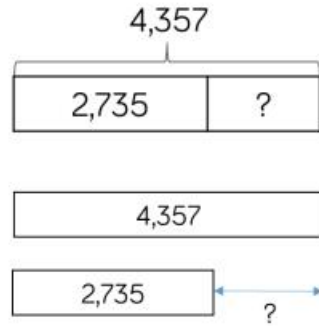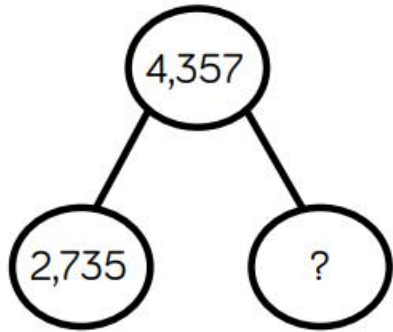
	4,357	
2,735	?	

4,357

| 2,735 | → ? → |

$$\begin{array}{r} ^{3}\cancel{4}^{1}357 \\ -\ 2735 \\ \hline 1622 \end{array}$$

$$4{,}357 - 2{,}735 = 1{,}622$$

Thousands	Hundreds	Tens	Ones

Thousands	Hundreds	Tens	Ones
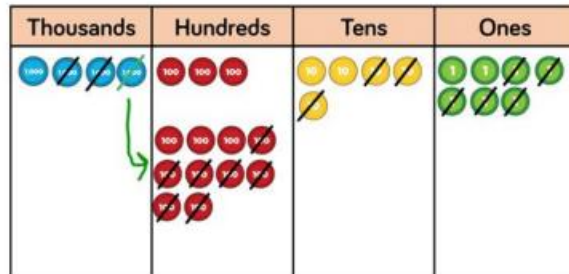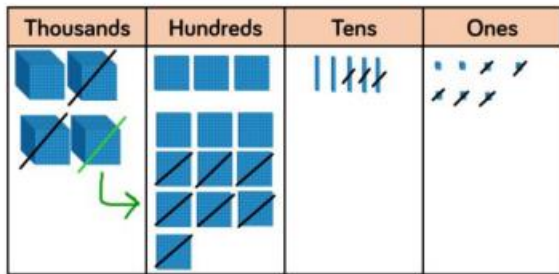
Year 5/6

Skill: Subtract with up to 3 decimal places

2.7   ?

5.43

	5.43	
2.7	?	

5.43

| 2.7 | → ? → |

$$\begin{array}{r} ^{4}\cancel{5}^{1}.43 \\ -\ 2.7 \\ \hline 2.73 \end{array}$$

$$5.43 - 2.7 = 2.73$$

Ones	●	Tenths	Hundredths

Ones	●	Tenths	Hundredths

Get out of my house
Addition and Subtraction Game

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
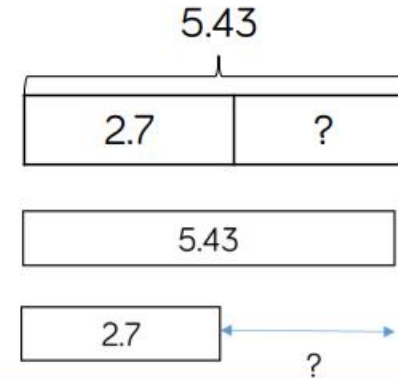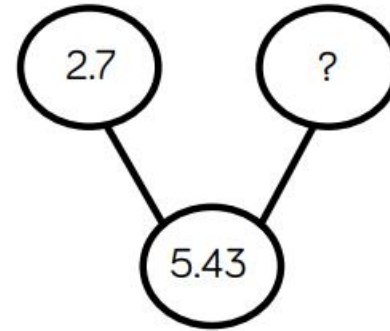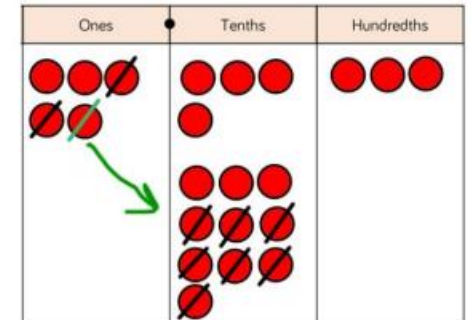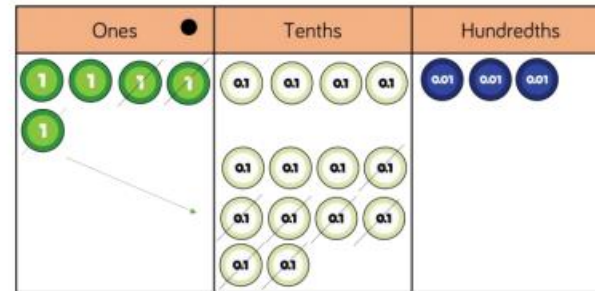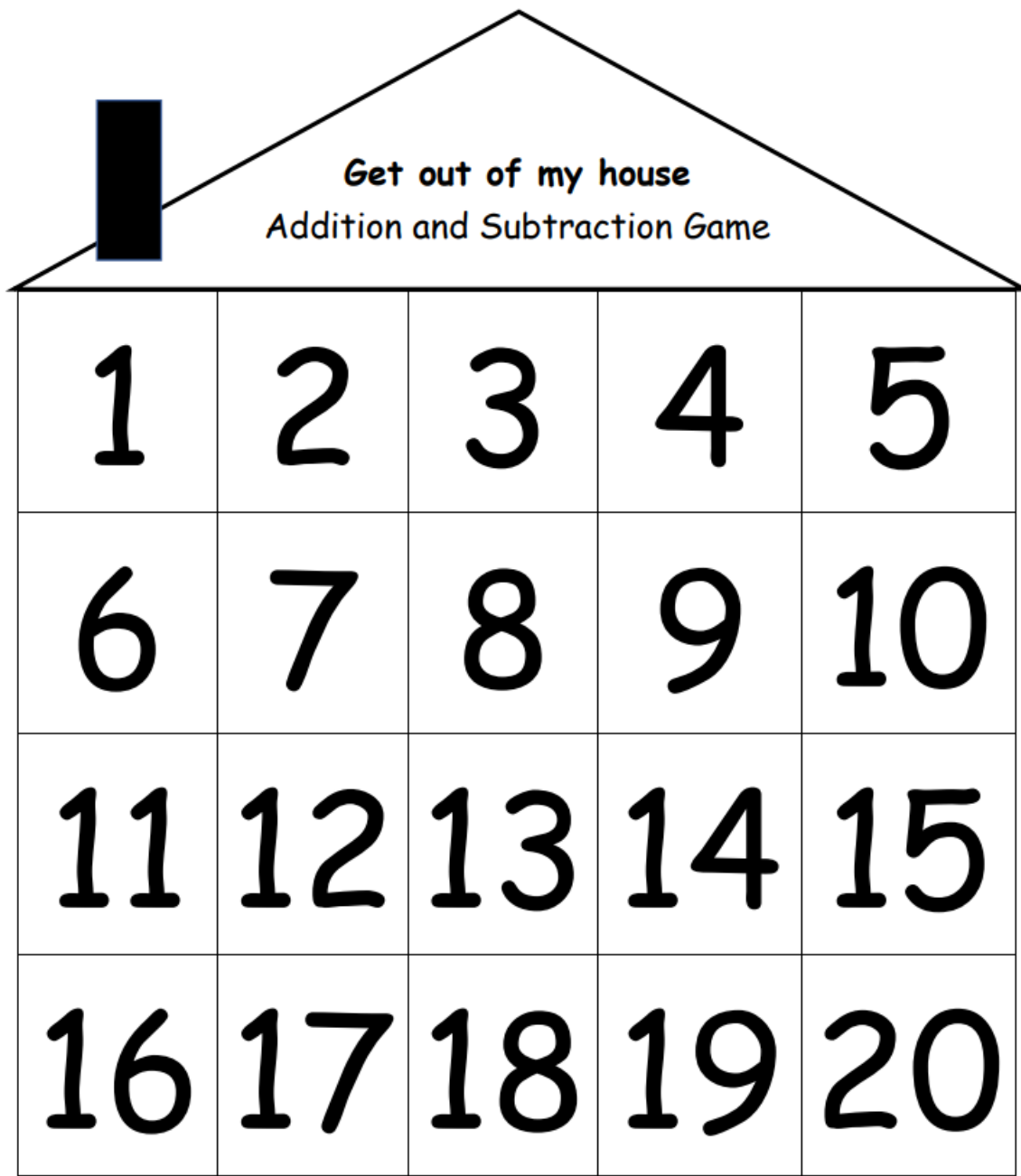
Closest to 100

Players   2

Materials: 2 dice, 120 chart (optional), scratch paper

How to Play: Roll two dice and create a 2-digit number.
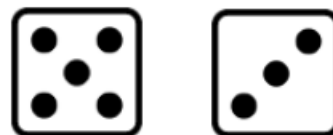
This could make 53 or 35.

Now, mentally find the difference between the 2-digit number and 100. One way to find the difference is to count up. For example, if a number rolled is 53, count up by 10s and then add the 1s to get to 100.

$$53 \xrightarrow{+10} 63 \xrightarrow{+10} 73 \xrightarrow{+10} 83 \xrightarrow{+10} 93 \xrightarrow{+7} 100$$

53 is 47 from 100

For each round, the score is the difference from 100. The player with a score closest to 100 after 5 rounds wins.

Multiplication

Times tables

Across the school we expect the majority of pupils to achieve the following standards –

YR – Begin to count in steps – 1's, 2's and 10's

Y1 – Be able to count in steps of 1, 2, 5 and 10 confidently to the 10th term

Y2 –To know their 2, 5, and 10 times tables (as times tables not as counting)

Y3 – To know their 3, 4, and 8 times tables (consolidate previous as well)

Y4 – Consolidation and move onto the 6, 7, 9, 11 and 12 times tables

Y5/6 – Consolidation and application

By ensuring this we are preparing the children to work with longer calculations

Skill: Solve 1-step problems using multiplication	Year: 1/2
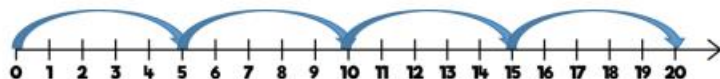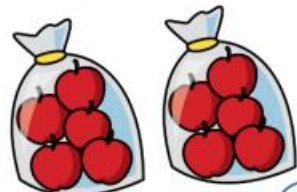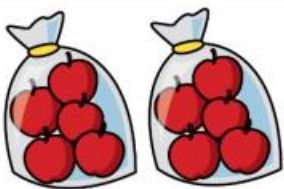
One bag holds 5 apples.
How many apples do 4 bags hold?
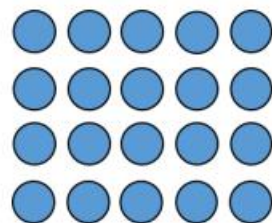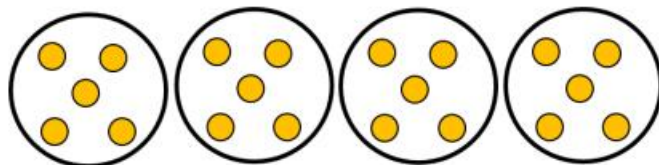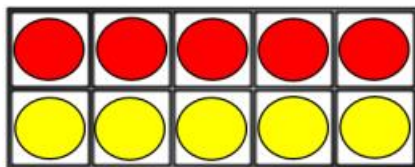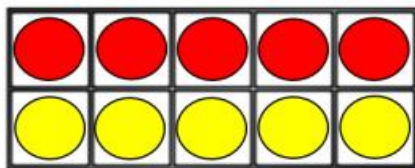
$$5 + 5 + 5 + 5 = 20$$
$$4 \times 5 = 20$$
$$5 \times 4 = 20$$

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

$$34 \times 5 = 170$$

	H	T	O	
		3	4	
×			5	
		2	0	(5 × 4)
+	1	5	0	(5 × 30)
	1	7	0	
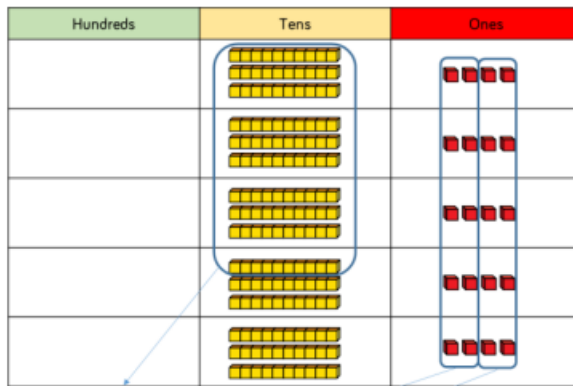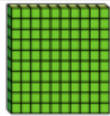
	H	T	O
		3	4
×			5
	1	7	0
		1	2
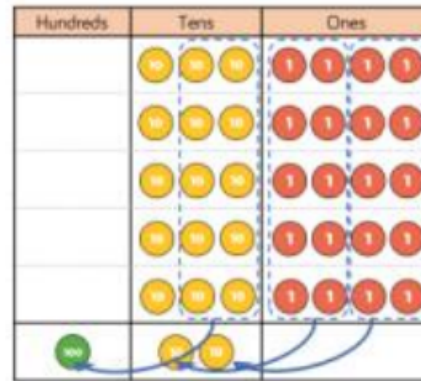
Informal methods and the expanded method are used in Year 3 before moving on to the short multiplication method in Year 4.

Place value counters should be used to support the understanding of the method rather than supporting the multiplication, as children should use times table knowledge.

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

Hundreds	Tens	Ones

	H	T	O
	2	4	5
×			4
	9	8	0
		1	2

$245 \times 4 = 980$

Hundreds	Tens	Ones
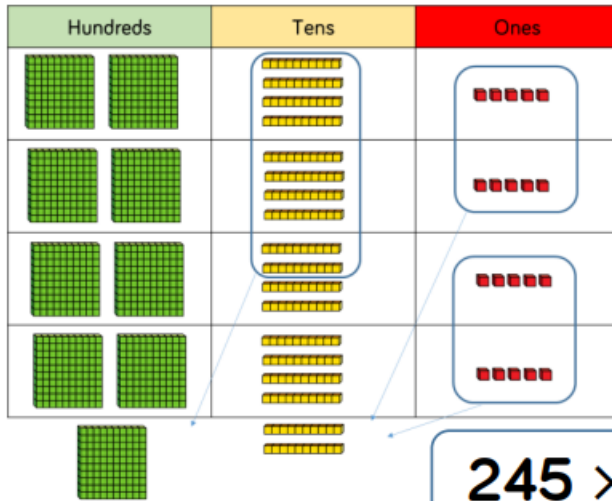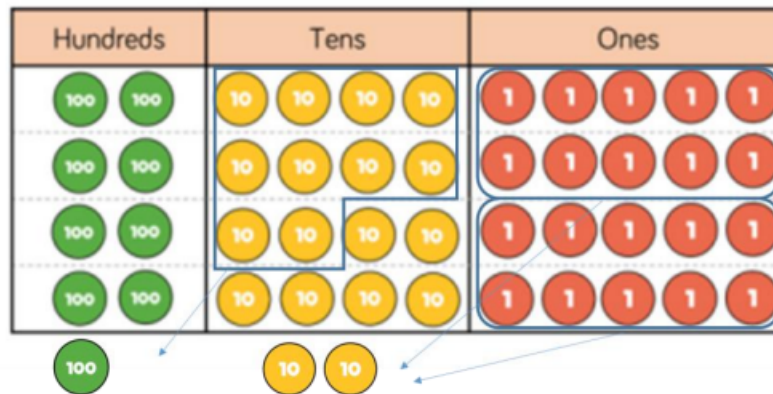
When moving to 3-digit by 1-digit multiplication, encourage children to move towards the short, formal written method.

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 2-digit numbers by 2-digit numbers	Year: 5
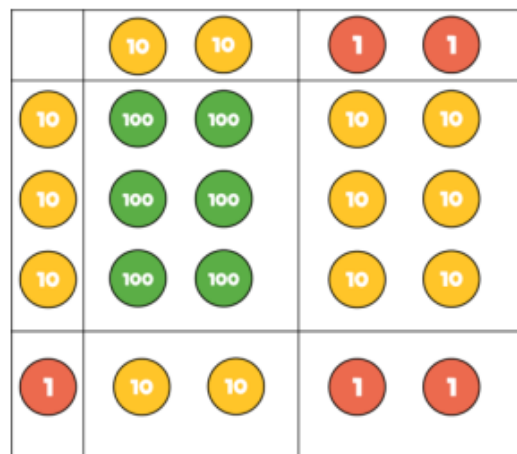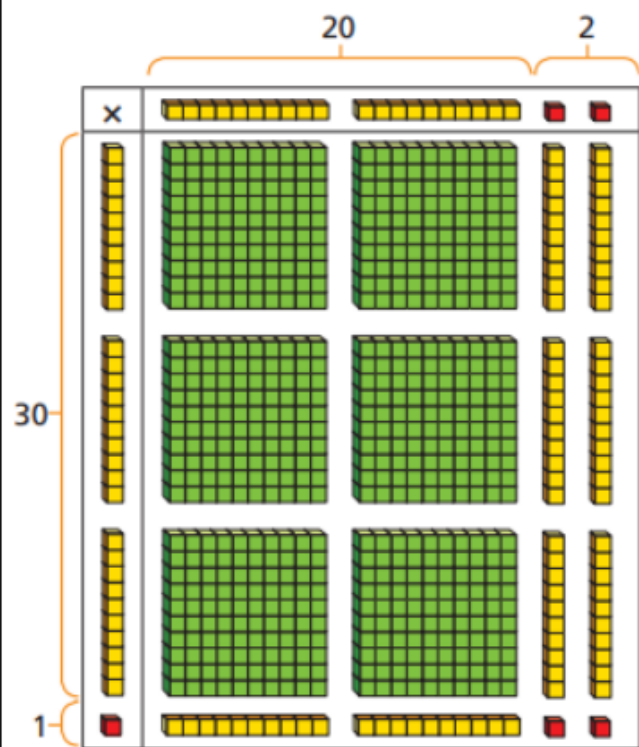
×	20	2
30	600	60
1	20	2

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

22 × 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.

Block Out

Players   2

Materials: 2 dice, graph paper, colored pencil or crayon for each player

How to Play: Roll 2 dice and draw a rectangle using the numbers rolled as the length and width on graph paper. Continue until there is no room to draw any more rectangles. Add the areas of all your rectangles and the highest score wins.

2 x 3	3 x 3	
5 x 2	4 x 3	

<u>Division</u>

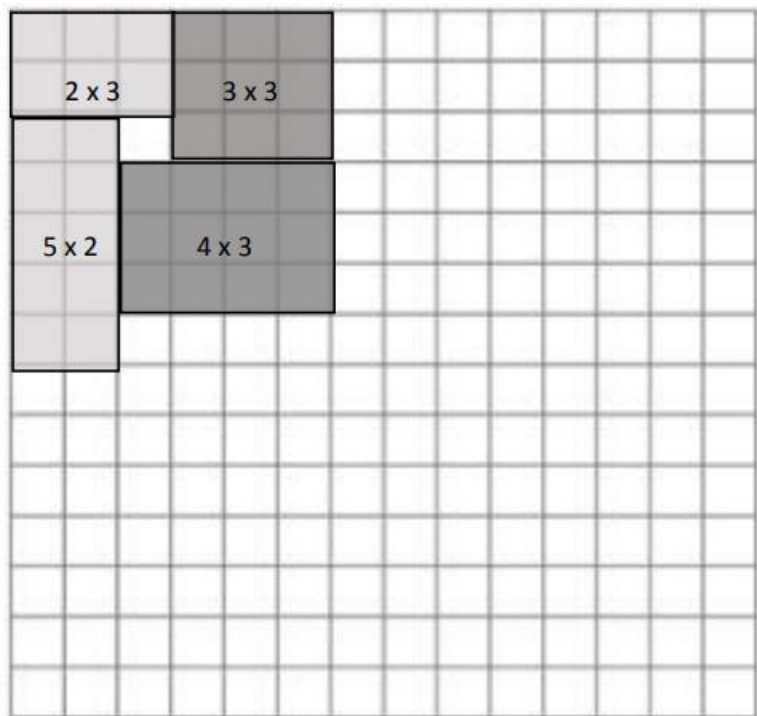| Skill: Solve 1-step problems using division (grouping)	Skill: Solve 1-step problems using multiplication (sharing)	Year: 1/2
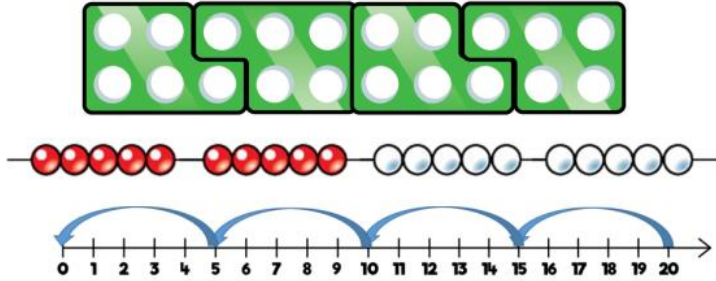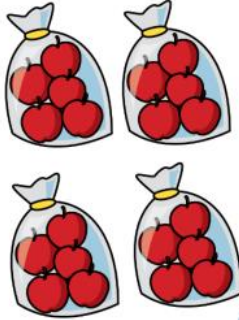
There are 20 apples altogether.
They are put in bags of 5.
How many bags are there?

$20 \div 5 = 4$

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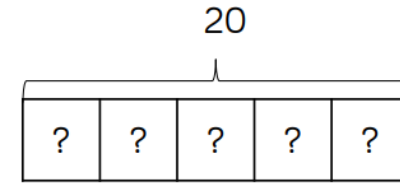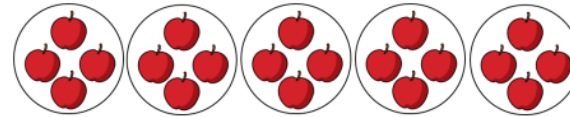
There are 20 apples altogether.
They are shared equally between 5 bags.
How many apples are in each bag?
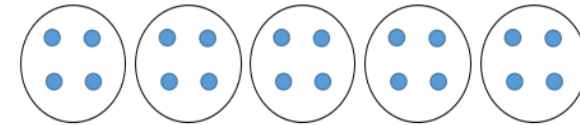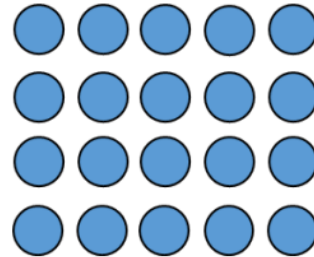
$20 \div 5 = 4$

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 symbol.
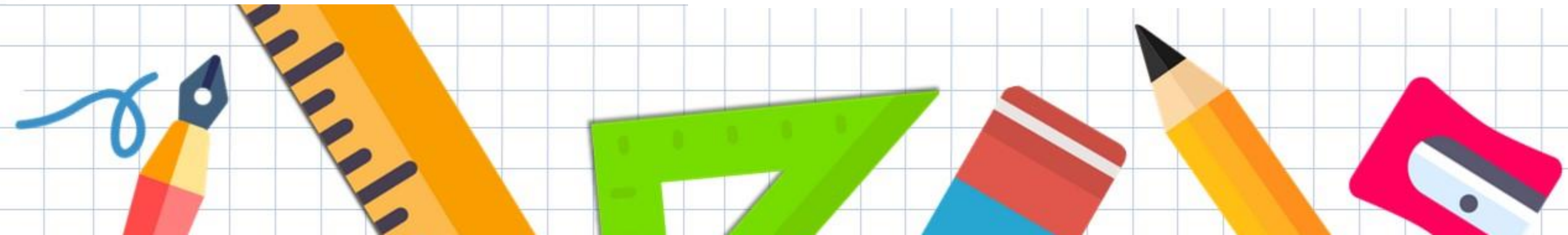
Skill: Divide 2-digits by 1-digit (sharing with no exchange)	Year: 3

Tens	Ones
10 10	1 1 1 1
10 10	1 1 1 1

$$48 \div 2 = 24$$

Part-whole model: 48 → 40, 8; 40 ÷ 2, 8 ÷ 2
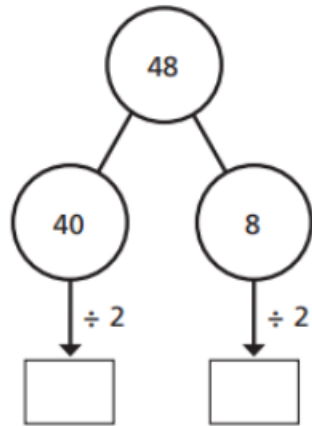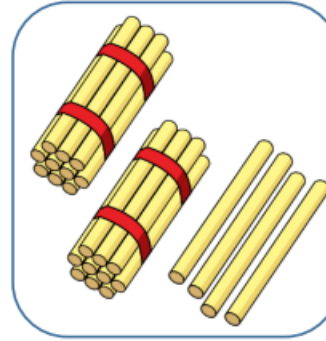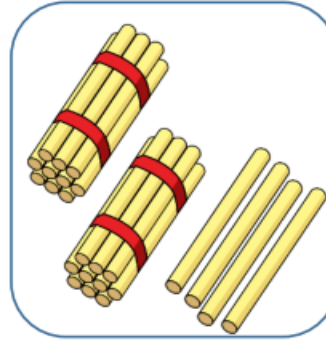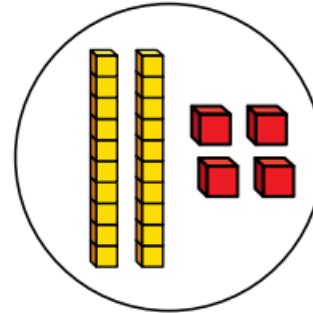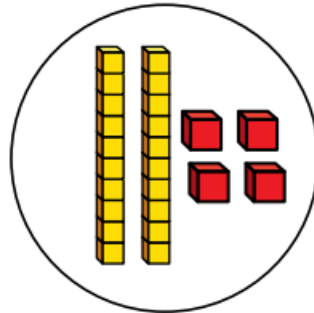
When dividing larger numbers, children can use manipulatives that allow them to partition into tens and ones.

Straws, Base 10 and place value counters can all be used to share numbers into equal groups.

Part-whole models can provide children with a clear written method that matches the concrete representation.

Skill: Divide 3-digits by 1-digit (sharing)	Year: 4

844 ÷ 4 = 211

844

?	?	?	?

H	T	O
100 100	10	1
100 100	10	1
100 100	10	1
100 100	10	1

844
800   40   4
÷ 4   ÷ 4   ÷ 4

856 ÷ 4 = 214

856
800   40   16
÷ 4   ÷ 4   ÷ 4
200   10   4
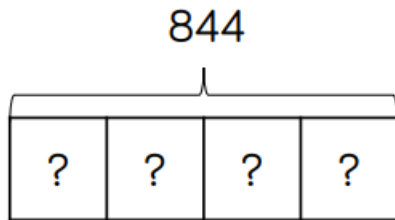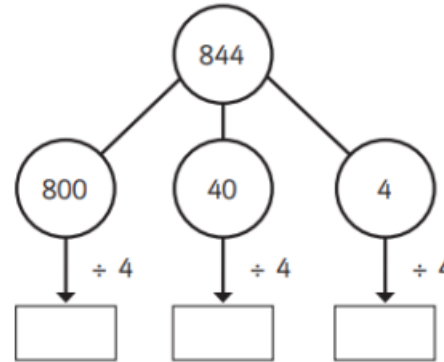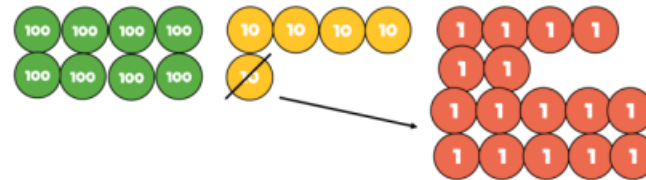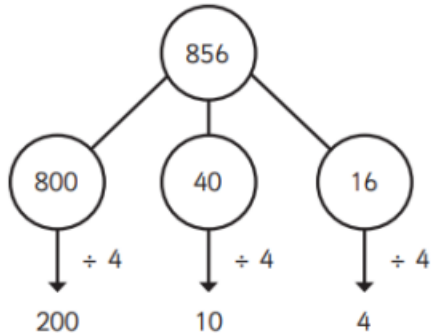
Hundreds	Tens	Ones
100 100	10	1 1 1 1
100 100	10	1 1 1 1
100 100	10	1 1 1 1
100 100	10	1 1 1 1

Children can continue to use place value counters to share 3-digit numbers into equal groups. Children should start with the equipment outside the place value grid before sharing the hundreds, tens and ones equally between the rows. This method can also help to highlight remainders. Flexible partitioning in a part-whole model supports this method.
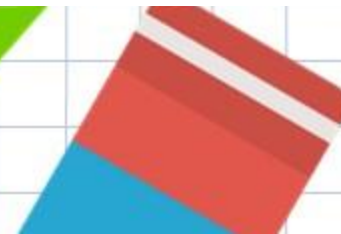
Skill: Divide 3-digits by 1-digit (grouping)	Year: 5
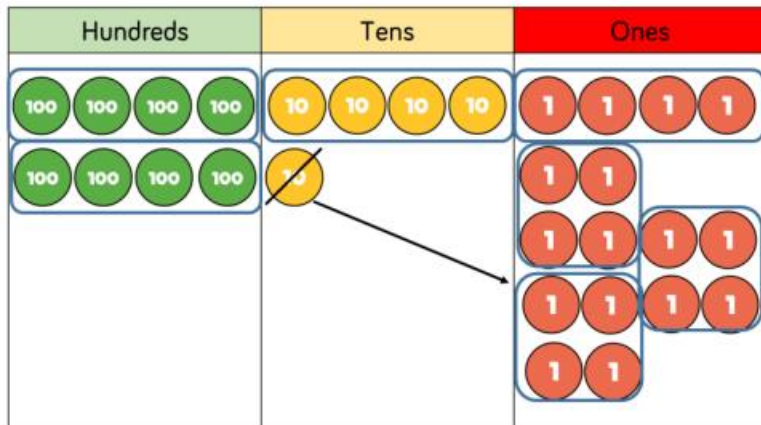
		2	1	4
	4	8	5	¹6
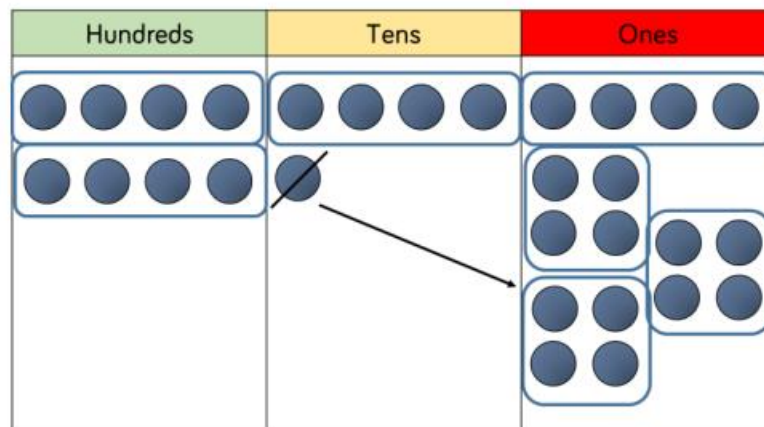
$$856 \div 4 = 214$$

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

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

			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 the quotient can be rounded as appropriate.

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

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

(×30)
(×6)

$$432 \div 12 = 36$$

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

(×400
(×80)
(×9)

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

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.

[Knock Off the Clock: a dice game for addition, subtraction, multiplication, and division (youtube.com)](https://youtube.com)

[Divide and Conquer - Math game for division (youtube.com)](https://youtube.com)