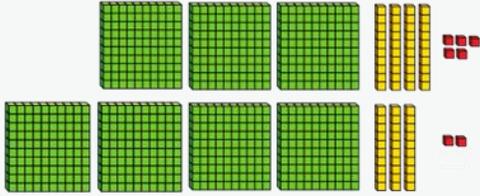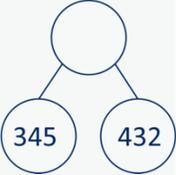**Year 3**

Calculation policy

Updated September 2024
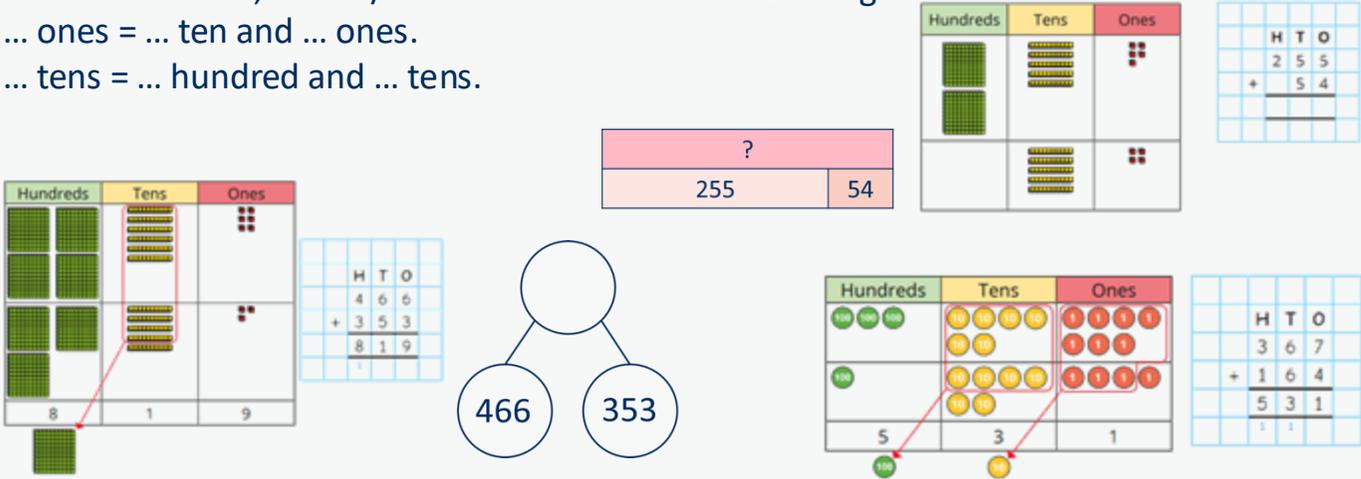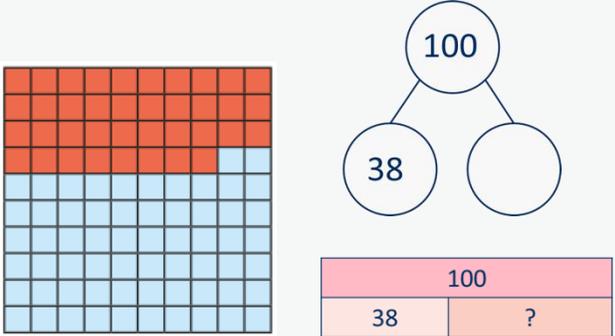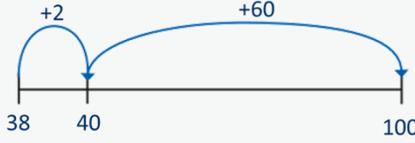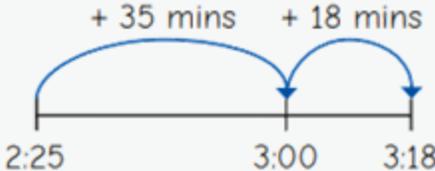
White Rose MATHS

Progression of skills – Addition

White Rose MATHS

Year 2	Year 3	Year 4
• Add 1s to any number (related facts)	• Add 1s, 10s and 100s to a 3-digit number	• Add 1s, 10s and 100s to a 4-digit number
• Add three 1-digit numbers	• Add two numbers (no exchange)	• Add up to two 4-digit numbers
• Add across a 10	• Add two numbers across a 10 or 100	• Add decimal numbers in the context of money
• Add multiples of 10	• Complements to 100	• Add fractions and mixed numbers with the same denominator beyond 1 whole
• Add 10s to any number	• Add fractions with the same denominator within 1 whole	
• Add two 2-digit numbers (not across a ten)	• Calculate the duration of events	
• Add two 2-digit numbers (across a ten)		
• Missing numbers		

Addition

Year 3	• Add numbers mentally, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds. • Add numbers with up to three digits, using formal written methods of columnar addition. • Add fractions with the same denominator within 1 whole. • Calculate the time taken by particular events or tasks.
Progression of skills	**Key representations**

Add 1s, 10s or 100s to a 3-digit number

Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.

The ones/tens/hundreds column will increase by …

Hundreds	Tens	Ones

$444 + 5 =$
$444 + 50 =$
$444 + 500 =$

H	T	O

$777 + 2 =$
$777 + 20 =$
$777 + 200 =$

What patterns do you notice?

$235 + 3 =$
$235 + 30 =$
$235 + 300 =$

$604 + 20 =$
$604 + 50 =$
$604 + 90 =$

$111 + \boxed{} = 118$
$111 + \boxed{} = 181$
$111 + \boxed{} = 811$

Add two numbers (no exchange)

Mental strategies and introduction of formal written method.

… ones + … ones = … ones
… tens + … tens = … tens
… hundreds + … hundreds = … hundreds

?	
345	432

345   432

Hundreds	Tens	Ones

	H	T	O
		3	4	5
+		4	3	2

Addition

Progression of skills	Key representations
Add two numbers across a 10 or 100 Formal written method involving up to 2 exchanges including 3-digit plus 2-digit numbers.	There are … ones, so I do/do not need to make an exchange. There are … tens, so I do/do not need to make an exchange. … ones = … ten and … ones. … tens = … hundred and … tens.
Complements to 100 Pairs of numbers which total 100	… plus … is equal to 100 I add … to get to the next 10, then … to get to 100 $38 + 62 = 100$ $62 + 38 = 100$ $100 = 38 + 62$ $100 = 62 + 38$

Addition

White Rose MATHS

Progression of skills	Key representations
Add fractions with the same denominator within 1 whole Make links with known facts.	When adding fractions with the same denominator, I only add the numerator. ... fifths + ... fifths = ... fifths $\frac{1}{5} + \frac{1}{5}$ $\frac{1}{5} + \frac{2}{5}$ $\frac{1}{5} + \frac{3}{5}$ $\frac{2}{5}$ $\frac{1}{5}$ 0 $\frac{1}{5}$ $\frac{2}{5}$ $\frac{3}{5}$ $\frac{4}{5}$ $\frac{5}{5}$
Calculate the duration of events Find durations of time between a given start and end point. Children will need to calculate complements to 60	From ... to ... o'clock is ... minutes. From ... o'clock to ... is ... minutes. The total time taken is ... minutes. start finish **4:25** **4:55** start finish + 35 mins + 18 mins 2:25 3:00 3:18
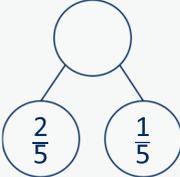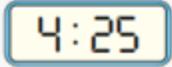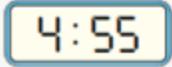
Progression of skills - Subtraction

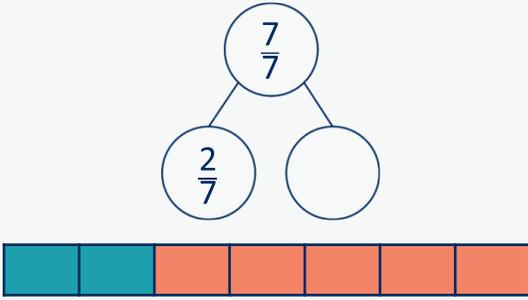| Year 2	Year 3	Year 4
• Subtract 1s from any number (related facts) • Subtract across a 10 • Subtract multiples of 10 • Subtract 10s from any number • Subtract two 2-digit numbers (not across a ten) • Subtract two 2-digit numbers (across a ten) • Missing numbers	• Subtract 1s, 10s and 100s from a 3-digit number • Subtract two numbers (no exchange) • Subtract two numbers across a 10 or 100 • Complements to 100 • Subtract fractions with the same denominator within 1 whole	• Subtract 1s, 10s, 100s and 1,000s from a 4-digit number • Subtract up to two 4-digit numbers • Subtract decimal numbers in the context of money • Subtract fractions and mixed numbers with the same denominator

Subtraction

Year 3	• Subtract numbers mentally, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds. • Subtract numbers with up to three digits, using formal written methods. • Subtract fractions with the same denominator within 1 whole.
Progression of skills	**Key representations**

Subtract 1s, 10s and 100s from a 3-digit number Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.	The ones/tens/hundreds column will decrease by … $444 - 2 =$ $444 - 20 =$ $444 - 200 =$ $777 - 4 =$ $777 - 40 =$ $777 - 400 =$	What patterns do you notice? $235 - 3 =$ $235 - 30 =$ $235 - 300 =$ $624 - 20 =$ $654 - 50 =$ $694 - 90 =$ $118 - \boxed{} = 111$ $181 - \boxed{} = 111$ $811 - \boxed{} = 111$
Subtract two numbers (no exchange) Mental strategies and introduction of formal written method.	… ones $-$ … ones $=$ … ones … tens $-$ … tens $=$ … tens … hundreds $-$ … hundreds $=$ … hundreds 	

Subtraction

Progression of skills	Key representations
Subtract two numbers across a 10 or 100 Formal written method involving up to 2 exchanges including 3-digit subtract 2-digit numbers.	I need to subtract … ones. I do/do not need to make an exchange. I need to subtract … tens. I do/do not need to make an exchange. I can exchange 1 … for 10 …
Complements to 100 Focus on subtraction facts. Encourage children to notice patterns.	100 minus … is equal to …
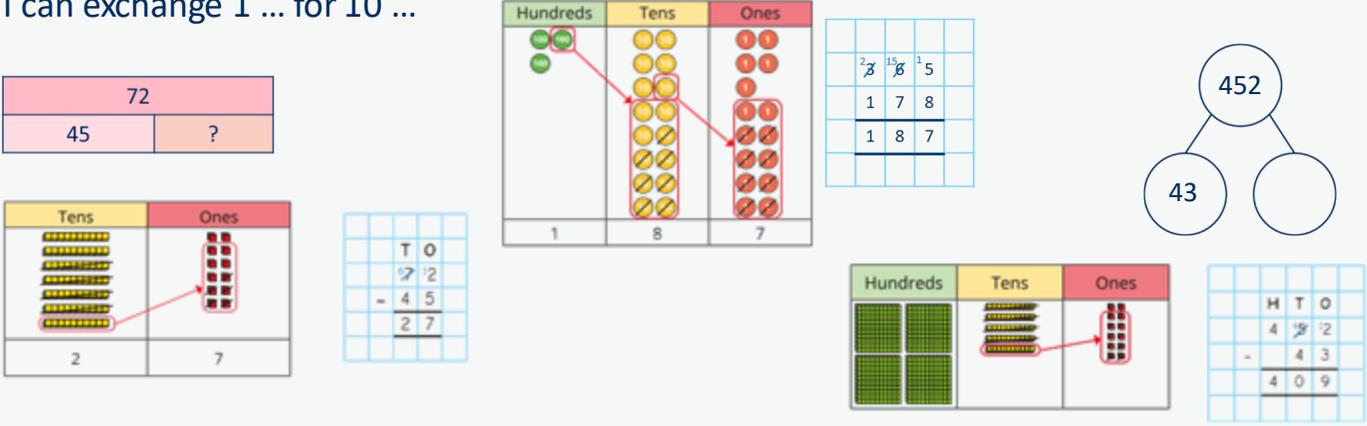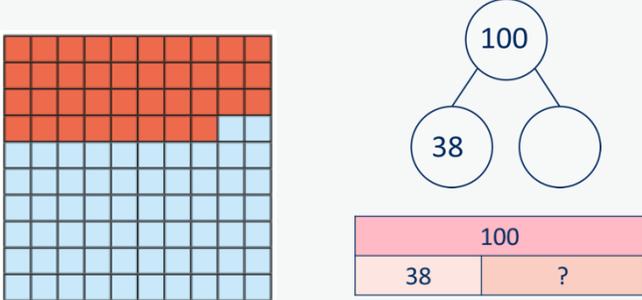
I subtract … tens, then I subtract … ones.

$$100 - 38 = 62$$
$$100 - 62 = 38$$
$$62 = 100 - 38$$
$$38 = 100 - 62$$

Subtraction

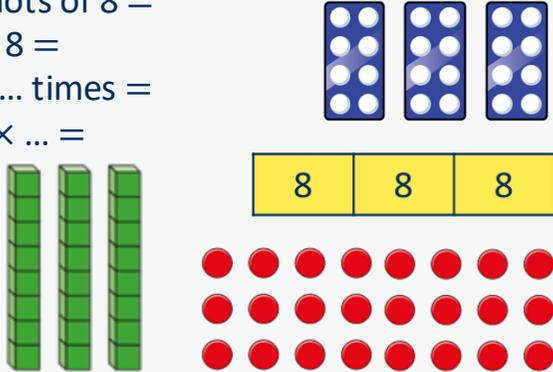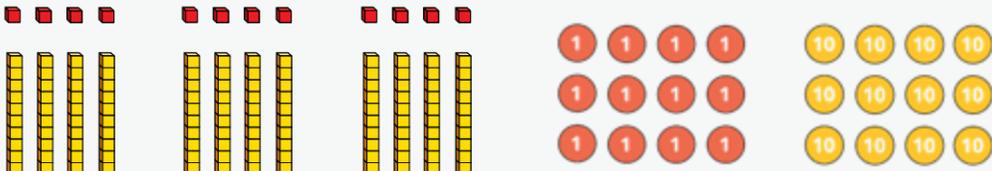| Progression of skills	Key representations
Subtract fractions with the same denominator within 1 whole Make links with known facts.	When subtracting fractions with the same denominator, I only subtract the numerator. … fifths − … fifths = … fifths $\frac{5}{5} - \frac{1}{5}$ $\frac{4}{5} - \frac{1}{5}$ $\frac{3}{5} - \frac{1}{5}$

Progression of skills – Multiplication

Year 2	Year 3	Year 4
• Link repeated addition and multiplication • Use arrays • Double • The 2 times-table • The 10 times-table • The 5 times-table • Missing numbers	• The 3 times-table • The 4 times-table • The 8 times-table • Related facts • Multiply a 2-digit number by a 1-digit number - no exchange • Multiply a 2-digit number by a 1-digit number - with exchange • Scaling • Correspondence problems	• Times-table facts to 12×12 • Multiply by 1 and 0 • Multiply 3 numbers • Factor pairs • Multiply by 10 and 100 • Related facts • Mental strategies • Multiply a 2 or 3-digit number by a 1-digit number • Scaling • Correspondence problems

Multiplication

Year 3	• Recall and use multiplication facts for the 3, 4 and 8 multiplication tables. • Write and calculate mathematical statements for multiplication using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods. • Solve problems, including missing number problems, involving multiplication, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.
Progression of skills	**Key representations**

The 3 times-table

Encourage daily counting in multiples both forwards and back.

… groups of 3 =
… × 3 =
3, … times =
3 × … =

| 3 | 3 | 3 | 3 |

… times 3 is equal to …

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

$$4 \times 3 = 12 \qquad 12 = 4 \times 3$$

0 3 6 9 12 15 18 21 24 27 30 33 36

The 4 times-table

Encourage daily counting in multiples both forwards and back. Encourage children to notice links between the 2 and 4 times-tables.

… groups of 4 =
… × 4 =
4, … times =
4 × … =
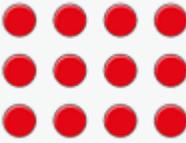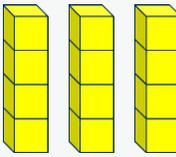
| 4 | 4 | 4 |

… times 4 is equal to …

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

$$3 \times 4 = 12 \qquad 12 = 3 \times 4$$

0 4 8 12 16 20 24 28 32 36 40 44 48

Multiplication

Progression of skills	Key representations

The 8 times-table

Encourage daily counting in multiples both forwards and back. Encourage children to notice links between the 2, 4 and 8 times-tables.

… lots of 8 =
× 8 =
8, … times =
8 × … =

8	8	8

… times 8 is equal to …

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

$$3 \times 8 = 24 \quad 24 = 3 \times 8$$

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

Related facts

Use knowledge of multiplying by 10 to scale times-table facts.

… × … ones is equal to … ones
so … × … tens is equal to … tens.

$$3 \times 4 = 12$$
$$3 \times 40 = 120$$

Multiply a 2-digit number by a 1-digit number - no exchange

Children apply their understanding of partitioning to represent and solve calculations using the expanded method.

… tens multiplied by … is equal to … tens.
…ones multiplied by … is equal to … ones.

Tens	Ones

$$30 \times 2 = 60$$
$$2 \times 2 = 4$$

$$32 \times 2 = 64$$

21 × 4

20 × 4   1 × 4

Tens	Ones

Multiplication

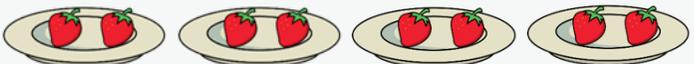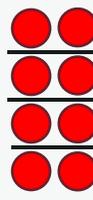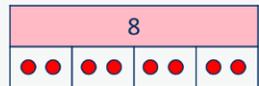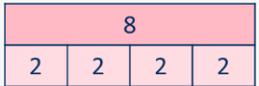| Progression of skills	Key representations
Multiply a 2-digit number by a 1-digit number - with exchange Children apply their understanding of partitioning to represent and solve calculations using the expanded method.	... tens multiplied by ... is equal to ... tens. ... ones multiplied by ... is equal to ... ones. $20 \times 4 = 80$ $4 \times 4 = 16$ $24 \times 4 = 96$
Scaling Children focus on multiplication as scaling (.... times the size) as opposed to repeated addition.	There are .... times as many ... as ... There are 3 times as many triangles as circles.	... is ... times the size of ... ... is ... times the length/height of ... 4 cm 16 cm Miss Smith is twice the height of Jo.

Multiplication

| Progression of skills	Key representations
Correspondence problems (How many ways?) Encourage children to work systematically to find all the different possible combinations.	For every … , there are … possible … There are … × … possibilities altogether. For every hat, there are two possible scarves. $3 \times 2 = 6$ There are 6 possibilities altogether.

Progression of skills – Division

White Rose MATHS

Year 2	Year 3	Year 4
• Divide by 2	• Divide by 3	• Division facts to 12 × 12
• Divide by 10	• Divide by 4	• Divide a number by 1 and itself
• Divide by 5	• Divide by 8	• Related facts
• Missing numbers	• Related facts	• Divide a 2 or 3-digit number by a 1-digit number
• Unit fractions	• Divide a 2-digit number by a 1-digit number - no exchange	• Divide by 10 and 100
• Non-unit fractions	• Divide a 2-digit number by a 1-digit number - with remainders	
	• Unit fractions of a set of objects	
	• Non-unit fractions of a set of objects	

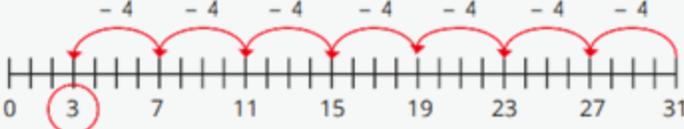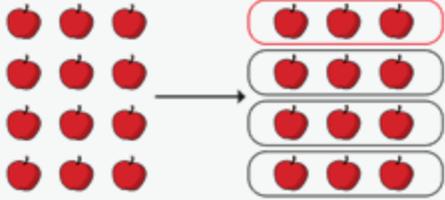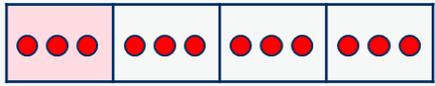# Division

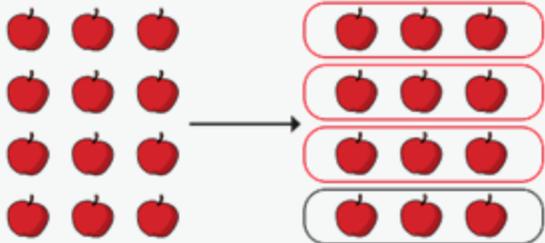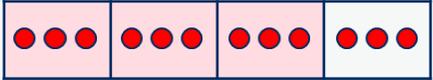| Year 3	• Recall and use division facts for the 3, 4 and 8 multiplication tables. • Write and calculate mathematical statements for division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods. • Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.
Progression of skills	**Key representations**
Divide by 3 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	There are … groups of 3 in … $… \div 3 =$ $2 \times 3 = 6$ $6 \div 3 = 2$ … has been shared equally into 3 equal groups. $… \div 3 =$ $2 \times 3 = 6$ $6 \div 3 = 2$
Divide by 4 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	There are … groups of 4 in … $… \div 4 =$ $2 \times 4 = 8$ $8 \div 4 = 2$ … has been shared equally into 4 equal groups. $… \div 4 =$ $2 \times 4 = 8$ $8 \div 4 = 2$
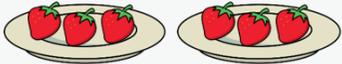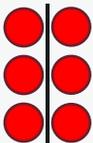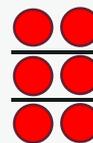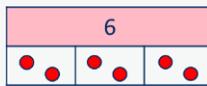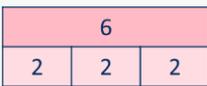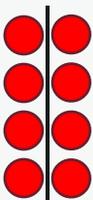
Division

Progression of skills	Key representations

Divide by 8

Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.

There are … groups of 8 in …
… ÷ 8 =

$2 \times 8 = 16$
$16 \div 8 = 2$

$-8 \quad -8$
$0 \quad 8 \quad 16$
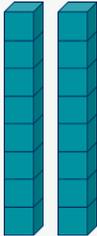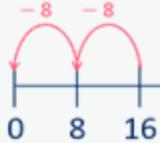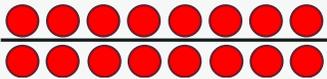
… has been shared equally into 8 equal groups.
… ÷ 8 =

8
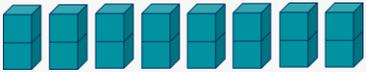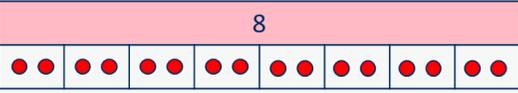
$2 \times 8 = 16$
$16 \div 8 = 2$

Related facts

Link to known times-table facts.

… ÷ … is equal to …,
so … tens ÷ … is equal to … tens.

$12 \div 3 = 4$
$120 \div 3 = 40$

Divide a 2-digit number by a 1-digit number - no exchange

Partition into tens and ones to divide and then recombine.

… tens divided by … is equal to … tens.
… ones divided by … is equal to … ones.

Tens	Ones

$60 \div 2 = 30$
$4 \div 2 = 2$

$64 \div 2 = 32$

$84 \div 4$

$80 \div 4 \qquad 4 \div 4$

Tens	Ones

Division

White R♦se
MATHS

Progression of skills	Key representations

Divide a 2-digit number by a 1-digit number - with remainders

Encourage children to partition numbers flexibly to help them to divide more efficiently.

… tens divided by … is equal to … tens.
… ones divided by … is equal to … ones.
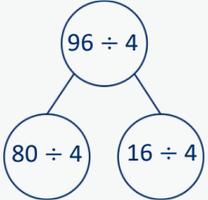
$$80 \div 4 = 20$$
$$16 \div 4 = 4$$
$$96 \div 4 = 24$$

There are … groups of …
There are … remaining.

$$31 \div 4 = 7 \text{ r}3$$

$$94 \div 4 = 23 \text{ r}2$$

Unit fractions of a set of objects

Bar models are useful to show the link between division and fractions, for example, dividing by 3 and finding a third.

The whole is divided into … equal parts.
Each part is $\frac{1}{\square}$ of the whole.

$\frac{1}{4}$ of 12 apples is 3 apples.

One … of … is …

$\frac{1}{4}$ of 12 is 3

$\frac{1}{3}$ of 36 is 12

Division

Progression of skills	Key representations
Non-unit fractions of a set of objects Bar models are a useful representation and show the links with division and multiplication.	The whole is divided into … equal parts. Each part is $\frac{1}{\square}$ of the whole. $\frac{3}{4}$ of 12 apples is 9 apples. $\frac{1}{\square}$ of … is …, so $\frac{\square}{\square}$ of … is … $\frac{3}{4}$ of 12 is 9 $\frac{2}{3}$ of 36 is 24