

Unit 1

Place value within 10,000,000



In this unit we will ...

- ✦ Learn to read and write numbers to 10,000,000
- ✦ Partition, compare and order numbers up to 10,000,000
- ✦ Round numbers
- ✦ Work with negative numbers

Do you remember what this is called? We will use it to help identify the place value of digits in a number.

M	HTh	TTh	Th	H	T	O
1	0	0	0	0	0	0



KEY LANGUAGE

There is some key language that children will need to know as a part of the learning in this unit.

- ones (1s), tens (10s), hundreds (100s), thousands (1,000s), ten thousands (10,000s), hundred thousands (100,000s), millions (1,000,000s), ten million (10,000,000)
- place value
- partition/partitioned/partitioning
- interval
- estimate
- compare/comparison/comparing
- order/ordering
- less than (<), greater than (>), equal to (=)
- rounding/rounded/round up/round down/rounds
- negative, positive
- odd, even
- accurate/accurately, exactly, approximately

STRUCTURES AND REPRESENTATIONS

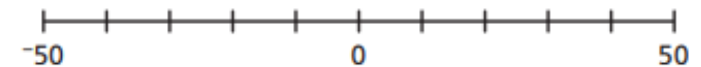
Place value grid: Place value grids are used with both counters and numbers in this unit to help children read numbers and recognise the value of each digit in numbers up to 10,000,000.

M	HTh	TTh	Th	H	T	O
4	5	9	0	1	2	4

Part-whole model: Part-whole models are used to help children partition numbers.



Number line: Number lines are used to help children plot numbers from 0 to 10,000,000, work out differences and round numbers. Later in the unit, they are used to show negatives and work out intervals across 0.



Bar chart: A bar chart is used in this unit to give context to children's learning about number.

Bar model: A bar model is used to help children understand how to work out the value of unlabelled intervals on a number line.

Unit 2

Four operations 1



In this unit we will ...

- ✂ Use written methods for addition and subtraction
- ✂ Learn to use column multiplication
- ✂ Learn different written methods for division
- ✂ Learn checking strategies for our calculations

Do you remember what this model is called? We will use it to represent different multiplication calculations. What calculation is being shown here?

	3,000	400	50	6
7	21,000	2,800	350	42



KEY LANGUAGE

There is some key language that children will need to know as part of the learning in this unit.

- ➔ add, subtract, sum, total, difference
- ➔ method, column, columnar
- ➔ multiply, multiplication, product, approximation
- ➔ divide, division, short division, long division
- ➔ factor, multiple, divisor, dividend, remainder
- ➔ inverse grid method
- ➔ fraction, simplify, numerator, denominator

STRUCTURES AND REPRESENTATIONS

Column methods of addition and subtraction: These models are used to enable children to efficiently solve addition and subtraction calculations.

Grid method: The model is used to support children's conceptual understanding of column multiplication. It can also be used inversely to help their conceptual understanding of both short and long division.

	2,000	300	40	5
4	8,000	1,200	160	20

Column method of multiplication: This model is used to enable children to efficiently solve multiplication calculations.

Short division and long division: These models are used to enable children to efficiently solve the division of a number with up to 4 digits by a 1-digit number and by a 2-digit number respectively.

$$\begin{array}{r}
 \begin{array}{cccc}
 2 & 3 & 4 & 5 \\
 4 \overline{) 9 \ 3 \ 8 \ 2 \ 0}
 \end{array}
 &
 \begin{array}{r}
 \begin{array}{ccc}
 3 & 5 & 6 \\
 24 \overline{) 8 \ 5 \ 4 \ 4} \\
 - 7 \ 2 \ 0 \ 0 \\
 \hline
 1 \ 3 \ 4 \ 4 \\
 - 1 \ 2 \ 0 \ 0 \\
 \hline
 1 \ 4 \ 4 \\
 - 1 \ 4 \ 4 \\
 \hline
 0
 \end{array}
 \end{array}
 \end{array}$$

Number line: Number lines are used to help represent division, particularly when teaching about remainders.

Place value grid and counters: This model helps children to recognise the value of each digit in a number and to create and partition numbers.

Bar model: This model is used to represent the solving of division calculations pictorially.

Unit 3

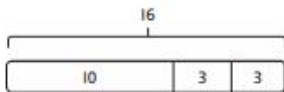
Four operations 2



In this unit we will ...

- ✦ Find common factors and multiples
- ✦ Learn about prime, square and cube numbers
- ✦ Learn about the order of operations
- ✦ Solve mental calculations

Do you remember what this model is called? We will use it to represent different calculations. Can you tell what calculation is being represented here?



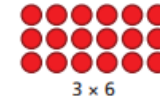
KEY LANGUAGE

There is some key language that children will need to know as a part of the learning in this unit.

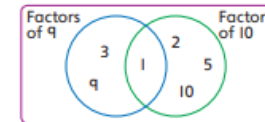
- ➔ factor, common factor
- ➔ multiple, common multiple
- ➔ prime
- ➔ squared (x^2), cubed (x^3)
- ➔ order of operations, brackets
- ➔ inverse operation

STRUCTURES AND REPRESENTATIONS

Array: Arrays are a visual representation of multiplication and division. They are an excellent tool for showing equal groups within a number.



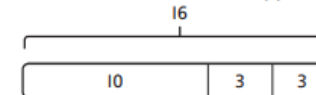
Sorting circles/diagram: Sorting circles (or sorting diagrams) are used in this unit to organise numbers with certain properties.



100 square: The 100 square is used in this unit to highlight patterns and relationships between factors and multiples, and to show prime numbers.



Bar model: Bar models enable children to more easily represent a problem. In the context of this unit, they are used to show different types of calculations.



Number line: A number line is a more abstract representation of a sequence of numbers. It is used in this unit to represent different calculations, for example, finding the difference between two numbers.

Part-whole model: Part-whole models help to clearly show the different ways a number can be partitioned.

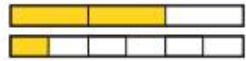
Unit 4 Fractions 1



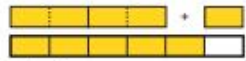
In this unit we will ...

- ✂ Simplify fractions
- ✂ Compare and order fractions
- ✂ Add and subtract fractions including mixed numbers
- ✂ Solve problems involving adding and subtracting fractions

Do you remember how to add two fractions where one denominator is a multiple of another?



$$\frac{2}{3} + \frac{1}{3}$$



$$\frac{2}{3} + \frac{1}{3} = \frac{3}{3} = 1$$



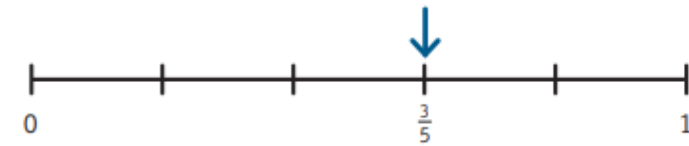
KEY LANGUAGE

There is some key language that children will need to know as part of the learning in this unit.

- whole, part
- numerator, denominator, common denominator
- equivalent
- simplify, simplest form
- factor, highest common factor, lowest common multiple
- compare
- order, ascending, descending
- less than, greater than
- proper fraction, improper fraction
- mixed number
- convert

STRUCTURES AND REPRESENTATIONS

Number lines: The number line will allow children to see which numbers a fraction sits between and the fractional divisions. They can help children to visualise fractional increases or decreases.



Fraction strips: These models allow children to see how to split up fractions so they can be added or subtracted using common denominators.



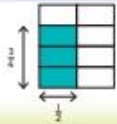
Unit 5 Fractions 2



In this unit we will ...

- ✦ Multiply any fraction by a whole number or another fraction
- ✦ Divide a fraction by a whole number
- ✦ Solve problems involving all four operations with fractions
- ✦ Solve problems involving a fraction of an amount

You will be able to multiply a fraction by a fraction by showing each fraction on the side of a grid. What is $\frac{1}{2} \times \frac{2}{3}$?



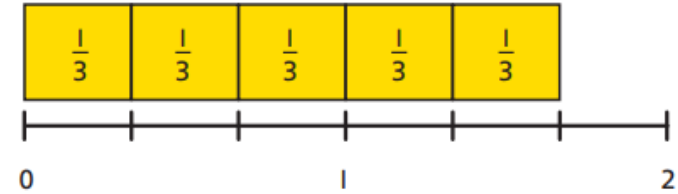
KEY LANGUAGE

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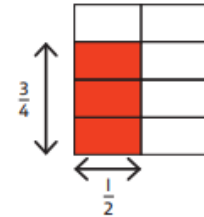
- ➔ numerator, denominator
- ➔ multiply, divide
- ➔ proper fraction, improper fraction, mixed number, whole number
- ➔ whole, part
- ➔ order of operations

STRUCTURES AND REPRESENTATIONS

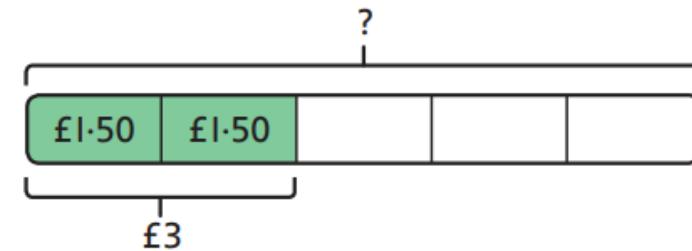
Number line and fraction strip: This model helps children convert between improper fractions and mixed numbers.



Fraction grid: This model will help children to understand how to multiply fractions, developing the understanding that not only the numerators but also the denominators are multiplied together.



Bar model: This model will help children solve problems involving fractions of an amount, where they are either given the whole or given the fraction of the amount.

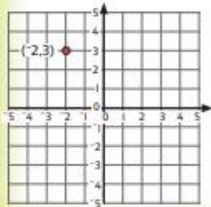


Unit 6 Geometry – position and direction



In this unit we will ...

- Look at how we can use coordinates to describe the position of a point on a grid
- Look at how coordinates can have positive or negative values
- Explore how we can use our knowledge of properties of shape to help us solve problems on a coordinate grid
- Explore how we can move and change shapes on a coordinate grid, through translations and reflections



We are going to use grids like this in this unit. How is it different to what you have met before?



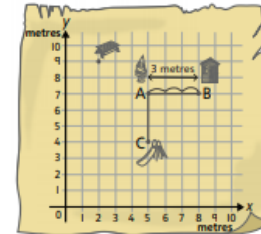
KEY LANGUAGE

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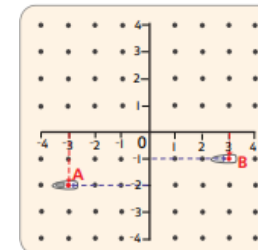
- ➔ plotting, coordinates, quadrant, point, axis, x-axis, y-axis, grid, x-coordinate, y-coordinate
- ➔ vertices, vertex, square, side, rectangle, triangle, equilateral, oblong, shape, irregular, hexagon, identical, similar, parallelogram
- ➔ perimeter, metre (m), distance, length, long
- ➔ horizontal, vertical
- ➔ halfway, line, properties, value, reason
- ➔ negative, positive
- ➔ translation, reflection, original, left, down, up, right, mirror, away, diagonal

STRUCTURES AND REPRESENTATIONS

Coordinate grid with one quadrant: Children are reintroduced to coordinate grids with just one quadrant which they have learnt about previously. They will use these to plot coordinates in the first quadrant.



Coordinate grid with four quadrants: Children are then introduced to coordinate grids which show all four quadrants. They will use these to plot coordinates in all four quadrants, work out missing coordinates in shapes and reason about shapes using their coordinates.



Zero-centred number line: Children may also benefit from using a 0-centred number line and thinking about how it relates to the x- and y-axes of a coordinate grid, so that they are able to correctly identify where to plot coordinates with positive or negative values.

