

# No Nonsense Number Facts

Sample  
Material

## NEW Complete Programme Supporting Fluency in Number Facts by the Babcock LDP Primary Mathematics Team

**No Nonsense Number Facts** provides teachers with a coherent programme for supporting fluency in number facts in line with the aims of both the national curriculum and teaching for mastery.

The programme is easy to use, flexible and comprehensive. With plenty of guidance to improve teachers' own subject knowledge, engaging activities and helpful resources, *No Nonsense Number Facts* enables you to implement an effective number facts programme for Years 1 to 6.

### **No Nonsense Number Facts**

- **6 Teacher Books**
- **USB Stick** - editable overviews, lesson plans and resources, plus video guidance from the author team

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# Introduction

## Teaching for mastery: fluency through reasoning

### Why No Nonsense Number Facts?

*No Nonsense Number Facts* has been devised to provide teachers with a coherent progression for supporting fluency underpinned by reasoning. This is in line with both the aims of the National Curriculum and the teaching for mastery agenda, and the approach reflects recent research into how children learn mathematics.

The National Curriculum for Mathematics aims to ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that they develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions. (DfE 2013)

These aims, although stated separately, are linked and interdependent. They require pupils of all ages to make and justify decisions in all areas of mathematics. *No Nonsense Number Facts* has been written in response to these aims, with a clear focus on making and justifying decisions related to number facts.

### Fluency

The first of the aims of the National Curriculum, fluency, was the catalyst for the creation of *No Nonsense Number Facts*. Fluency is far more than memorisation of facts; research indicates that focusing mainly on memorisation actually works *against* fluency. Countries where high proportions of students rely heavily on memorising, without understanding, perform poorly in international tests (see Boaler and Zoido, 2016).

Understanding is, therefore, an essential part of fluency – in particular, understanding of relationships between numbers and operations, and understanding of the number system (see Russell, 2000). Fluency involves using this understanding to:

- notice things
- make connections between what is known and what is unknown
- make decisions.

A key element of fluency is reasoning; practice that focuses on reasoning strategies, looking for connections, patterns and relationships, is likely to be more effective (see Baroody, 2008). *No Nonsense Number Facts* provides such purposeful practice.

## Reasoning

The activities included in *No Nonsense Number Facts* aim to support pupils in developing an expectation that they will reason about what is already known in order to work out what is unknown. It explicitly and repeatedly draws attention to this. Pupils are asked to **notice things** and then **make decisions, using what they know** and their **understanding of relationships** to **solve problems efficiently**.

Developing reasoning is not an optional extra in mathematics learning – it is essential. Research by Terezinha Nunes *et al* (2009) identified the ability to reason mathematically as the most important factor in a pupil's success in mathematics.

## Teaching for mastery

Reasoning is built on understanding mathematics as a connected body of knowledge. This is one of the elements of teaching for mastery in mathematics, as explained by NCETM: 'focusing on mathematical relationships and making connections'. Teaching strategies that support teaching for mastery include: supporting the use of mathematical language through repetition, choral speaking and sentence stems; using carefully chosen examples and representations to draw out structure; attention to mathematical relationships; and the sharing, discussing and analysing of thinking about the mathematics.

*No Nonsense Number Facts* reflects all these key elements of teaching for mastery. The activities focus on making connections, which includes connecting ideas both within and between sessions. They draw attention to structure, using images and drawing where appropriate, to support understanding of relationships. Pupils are asked to notice things, make connections and explain their thinking throughout the activities. Within and across activities, variation is used to draw attention to specific relationships and structures. All of this contributes to developing a community of learners who expect to make decisions and do things in different ways depending on the numbers involved, in order to solve problems efficiently.

## How *No Nonsense Number Facts* is organised

- The elements of the National Curriculum that focus on number facts have been grouped around key understandings in each year. The mapping of the National Curriculum to the materials can be found on the USB. Sometimes measures are used as a context for the mathematics; the measures can be changed as required. The programmes of study for measure have not been included in the mapping document, but all aspects of measure that involve number and the number system, additive reasoning and multiplicative reasoning can be explored through these materials.
- The key understandings across the six years are listed on the USB and focus on elements of understanding number and the number system, additive reasoning and multiplicative reasoning – all of which contribute to fluency.
- Each year group has six half-termly blocks, each focusing on one overarching understanding. The start of one year revises understanding from the previous year and then builds on this understanding throughout the year.
- Each half-termly block consists of six weeks; each week is a sequence of five lessons. The focus for each week, within the blocks, is set out on pages 10–11. The five lessons in a week often take a specific element of the connective model (see page 6) as a starting point for reasoning about the mathematics.

- The lessons are intended to run for between fifteen and thirty minutes. They may take place as a standalone sequence of lessons, focused on developing fluency, which runs in tandem with daily maths lessons. They can also be used as part of maths lessons, as warm-ups or cool-downs. Teachers could also choose to use them as the starting point for a full maths lesson, expanding on the content provided.
- The lesson organisation is flexible. Each block has a suggested order for the six weeks but this should be varied as required. One week of sessions could be extended to run across more than a week, and lessons/weeks can be omitted. The focus of the block and the needs of the pupils should guide teachers in making decisions. Within a week, sessions can be repeated if desired by varying the numbers or contexts, or run over more than one session. The mathematical journey in each activity is important, as it is intended to support understanding; if it takes several sessions to complete that journey so that all the pupils understand the mathematics, then it is important that this happens.

## The lesson plans

The lessons follow the structure in the table below.

<b>Session</b>	<i>Reference to block of lessons, week number and lesson number in the sequence.</i>
<b>Session focus</b>	<i>Overarching understanding for the block.</i>
<b>Resources</b>	<i>A list of resources needed: a combination of printable resources (seen for reference in the Resources section and found on the USB) and mathematics resources (see page 8).</i>
<b>Teaching activity</b>	<p><i>Mathematical journey for the session, including key questions, and focusing on connecting mathematical experiences as shown in the connective model* below.</i></p> <div style="text-align: center;"> <pre> graph TD     S[Symbols] &lt;--&gt; L[Language]     S &lt;--&gt; M[Mathematical image/picture]     L &lt;--&gt; M     L &lt;--&gt; C[Context]     M &lt;--&gt; C     S &lt;--&gt; C </pre> <p>The diagram is a connective model with four nodes: Symbols at the top, Context at the bottom, Language on the left, and Mathematical image/picture on the right. All four nodes are interconnected by double-headed arrows, forming a complete graph.</p> </div> <p><i>Pupils are asked to explain their thinking, represent their maths in different ways, interpret and create contexts for the mathematics, and link this to symbolic representations. Allow time for pupils to discuss their thinking, rehearse their ideas and share with the class. Lessons within a five-day sequence are arranged so that each day builds on understanding from previous days in the sequence as well as previous weeks in the block.</i></p>

\* Babcock LDP (2004) adapted from Haylock and Cockburn (1989)

The teaching activities start from different parts of the connective model in order to build conceptual understanding. This includes:

- **Context**
  - **Real-life scenarios:** mathematics presented orally in contexts familiar to most children, such as raising money for charity. The focus of the activities is to support pupils in explaining the connections between number facts/calculations and contexts in order to fully understand the mathematics. Sometimes fictional or imaginary characters are used, for example Eddie the Elephant in Year 2 Block 2 Week 4, Charlie Muncher in Year 3 Block 3 Week 4 and Snow White in Year 4 Block 3 Week 3. These should be adapted to match the experience of the pupils being taught.
  - **Multi-representational cards:** mathematics presented visually in different contexts, with pupils asked to make sense of the representations and make connections between different contexts and symbolic representation.
- **Mathematical image**
  - **Visual representations of numbers:** exposing mathematical structure, sometimes 'concrete' and sometimes 'pictorial'. Images are used in these activities to support reasoning for all pupils. In comparing different images, links between facts are revealed and understanding deepened.
  - **Physical activity:** making and understanding patterns and relationships, using large equipment or pupils themselves; occasionally these require access to a large space, indoor or outdoor.
- **Language**
  - **Spoken language:** counting/chanting facts/reading calculations/explaining in unison to allow the whole class to use the language. All pupils are expected to join in when they can.
  - **Number talks:** working as a community of learners in which pupils share their solutions to a problem and all ideas and answers are accepted, written down and included in the discussion, whether right or wrong. The numbers for the sessions have been carefully chosen to produce different methods so that contrasting strategies can be discussed.
- **Symbols**
  - **Connections:** using variation, through patterns of calculations or related representations, to expose structure. Sentence stems and mathematically structured resources are used to model and demonstrate the connections.
  - **Target boards:** asking pupils to make decisions and apply their understanding, using what they know to calculate with numbers chosen from a target board. The numbers on the target board have been chosen to focus pupils' attention on particular relationships and how they can use what they already know to solve problems.
  - **Games:** application of understanding, using simple games such as bingo and three in a row, with the rules, boards and cards varied to fit the area of mathematics.

## Mixed-age classes

There are different ways that the materials can be used with mixed-age classes. Where possible, the focus for the blocks in different years has been aligned so that teachers can use similar activities with age-appropriate content at the same time; this can be seen on the weekly charts for Years 1/2, 2/3, 3/4, 4/5 and 5/6 on the USB.

This is exemplified by Block 3 in Years 2 to 6, which focuses on using understanding of place value to add and subtract; what varies between the year groups is which part of

the number system features in the activities. This means that teachers can either choose activities from each of the relevant year groups and run them in parallel, or can select activities from one of the year groups and adjust them so that different numbers are available for the different year groups. For example, Year 2 Block 3 Week 5, Year 3 Block 3 Week 2, Year 4 Block 3 Week 4, Year 5 Block 3 Week 5 and Year 6 Block 3 Week 5 all use target boards with activities that follow the same pattern – the first target board from each of these weeks could be used alongside each other or a target board combining numbers from two or more of these boards could be created.

## Assessing and challenging thinking

Pupils' understanding is assessed throughout the activities. They are asked to make connections, describe and explain their thinking, represent their understanding in different ways, and make up their own examples and non-examples. 'Doing' the maths is not enough. When children seem able to 'do' the activities quickly, or are focused only on 'answering quickly', they should be challenged – asking them to demonstrate their understanding in the ways explained above will ensure that they deepen their understanding as well as providing rich assessment opportunities.

## Resources

**Supporting resources** that can be found on the USB include:

- resources for individual lessons, such as pictures, target boards, counting bar, dot cards, arrays and bingo cards
- generic resources used in many sessions:
  - place value arrow cards
  - place value charts
  - strips of dots – used for building arrays
  - ten frame cards
  - number cards.

**Structured mathematical resources** are used to support understanding and are therefore referenced throughout. These include:

- number frames – these are available in foam, plastic or wooden versions
- bead strings – ten beads in two blocks of five, twenty beads in four blocks of five and 100 beads in ten blocks of ten are all used
- bead bar – rigid version of the bead string useful for demonstrating for a whole class
- base ten – sometimes called Dienes after the Hungarian mathematician Zoltan Dienes – blocks, rods and flats of ones, tens, hundreds and thousands
- place value counters – counters with 1, 10, 100, etc. printed on them.

**Non-structured resources** are used to explore, make sense of and demonstrate understanding of the mathematics. These include:

- PE cones and bean bags
- counters
- small world objects.

# Overview

## Years 1 and 2

	Year 1	Year 2
Block 1	<p><b>Understanding and using one more and one less</b></p> <p>W1: One more and one less for numbers to ten            W2: One more and one less for numbers to ten            W3: One more and one less for numbers to twelve            W4: One more and one less for numbers to twenty            W5: One more and one less for numbers to twenty            W6: One more and one less for numbers to twenty</p>	<p><b>Understanding and using addition and subtraction facts for numbers to twenty</b></p> <p>W1: Connecting language to adding and subtracting to twenty            W2: Using understanding to add and subtract single-digits with numbers under twenty            W3: Using facts for ten for facts for twenty            W4: Connecting facts within ten to facts within twenty            W5: Connecting facts within ten to facts within twenty            W6: Applying understanding to add and subtract within twenty</p>
Block 2	<p><b>Additive composition of numbers up to five</b></p> <p>W1: Using subitising to know three, four and five            W2: Different ways of making two, three, four and five            W3: Different ways of making three, four and five            W4: Using understanding of four and five            W5: Applying understanding of four and five            W6: Applying understanding of four and five</p>	<p><b>Using understanding of addition and subtraction facts</b></p> <p>W1: Adding three single-digit numbers using understanding of ten and doubles            W2: Adding three and four single-digit numbers using understanding of ten and doubles            W3: Using understanding of ten to understand 100            W4: Using understanding of ten to understand 100            W5: Applying understanding of 100            W6: Applying understanding of 100 and adding three single-digit numbers</p>
Block 3	<p><b>Additive composition for ten</b></p> <p>W1: Recognising additive composition of ten            W2: Showing the additive composition of ten            W3: Exploring patterns within the additive composition of ten            W4: Applying understanding of the additive composition of ten            W5: Applying understanding of the additive composition of ten            W6: Applying understanding of the additive composition of ten</p>	<p><b>Using understanding of place value to add and subtract with two-digit numbers</b></p> <p>W1: Adding and subtracting one and ten with two-digit numbers            W2: Adding and subtracting one and ten using understanding of place value with two-digit numbers            W3: Using understanding of place value of two-digit numbers to add and subtract            W4: Using understanding of place value of two-digit numbers to add and subtract            W5: Applying understanding of place value to add and subtract with two-digit numbers            W6: Applying understanding of place value to add and subtract with two-digit numbers</p>
Block 4	<p><b>Additive composition of six, seven, eight and nine</b></p> <p>W1: Different ways of making six, seven, eight and nine            W2: Connecting composition of five, six, seven eight and nine            W3: Applying understanding of eight and nine            W4: Applying understanding of five, six, seven, eight and nine            W5: Applying understanding of six, seven, eight and nine            W6: Applying understanding of five, six, seven, eight and nine</p>	<p><b>Multiplicative understanding: twos and tens</b></p> <p>W1: Linking counting to multiples of two and ten            W2: Linking counting to multiples of two and ten            W3: Linking counting to multiples of ten and grouping into tens            W4: Multiplying two and ten and dividing by two and ten            W5: Applying understanding of multiplying two and ten and dividing by two and ten            W6: Applying understanding of multiplying two and ten and dividing by two and ten</p>
Block 5	<p><b>Understanding and using addition and subtraction facts for numbers to twenty</b></p> <p>W1: Connecting language to adding and subtracting to twenty            W2: Using understanding to add and subtract one-digit numbers            W3: Connecting facts within ten to facts within twenty            W4: Connecting facts for ten to facts for twenty            W5: Using facts for ten for facts for twenty            W6: Applying understanding to add and subtract two and five</p>	<p><b>Using understanding of addition and subtraction facts with two-digit numbers</b></p> <p>W1: Adding and subtracting two and twenty            W2: Adding and subtracting ones and tens            W3: Adding and subtracting three and thirty            W4: Adding and subtracting ones and tens            W5: Applying understanding to add and subtract pairs of two-digit numbers            W6: Applying understanding to add and subtract with two-digit numbers</p>
Block 6	<p><b>Early multiplicative understanding</b></p> <p>W1: Counting in twos, fives and tens            W2: Counting in twos, fives and tens            W3: Doubling and halving            W4: Applying understanding of doubling, halving, tens and fives            W5: Applying understanding of doubling, halving, tens and fives            W6: Applying understanding of doubling, halving, tens and fives</p>	<p><b>Multiplicative understanding: twos, fives and tens</b></p> <p>W1: Linking counting to multiples of two, five and ten            W2: Multiplying five and dividing by five            W3: Multiplying two, five and ten and dividing by two, five and ten            W4: Multiplying two, five and ten and dividing by two, five and ten            W5: Applying understanding of multiplying two, five and ten and dividing by two, five and ten            W6: Applying understanding of multiplying five and ten and dividing by five and ten</p>

# Years 3 and 4

	Year 3	Year 4
Block 1	<p><b>Using understanding of addition and subtraction facts to add and subtract with two-digit numbers</b></p> <p>W1: Using understanding of the additive composition of small numbers and number bonds</p> <p>W2: Additive composition of ten, twenty and 100</p> <p>W3: Connecting facts for ten and twenty with facts for 100 and other multiples of ten</p> <p>W4: Using understanding of ten and twenty to add to and subtract from two-digit numbers</p> <p>W5: Applying understanding of the additive composition of small numbers to add and subtract ones and tens</p> <p>W6: Applying understanding of number facts to ten to facts for 100 and numbers to twenty</p>	<p><b>Using understanding of addition and subtraction facts to add and subtract with three-digit numbers</b></p> <p>W1: Using understanding of additive composition of ten for understanding 1000</p> <p>W2: Using understanding of additive composition of ten for understanding 1000</p> <p>W3: Using understanding of additive composition of ten for understanding 1000</p> <p>W4: Using understanding of additive composition of ten to add and subtract with three-digit numbers</p> <p>W5: Applying understanding to add and subtract pairs of three-digit numbers</p> <p>W6: Applying understanding of adding and subtracting with three-digit numbers</p>
Block 2	<p><b>Multiplicative understanding including using understanding of place value: twos, fives and tens</b></p> <p>W1: Linking counting to multiples of two, five and ten</p> <p>W2: Multiplying two, five and ten and dividing by two, five and ten</p> <p>W3: Multiplying two, five, ten and twenty and dividing by two, five, ten and twenty</p> <p>W4: Multiplying two, five and ten, multiplying by two and dividing by two, five and ten</p> <p>W5: Using understanding of multiples of two, five and ten and understanding of place value to multiply and divide</p> <p>W6: Using understanding of multiples of two, five and ten and understanding of place value to multiply and divide</p>	<p><b>Multiplicative understanding including using understanding of threes and fives for sixes and understanding of tens for nines, elevens and twelves</b></p> <p>W1: Counting and using known facts to find multiples of three, six, nine, eleven and twelve</p> <p>W2: Using understanding of multiplying by ten to multiply by nine, eleven and twelve</p> <p>W3: Using understanding of threes and fives to for sixes and understanding of sixes for twelves</p> <p>W4: Using understanding of threes and fives for sixes and understanding of tens for nines, elevens and twelves</p> <p>W5: Applying understanding to multiply and divide by nine, eleven and twelve</p> <p>W6: Applying understanding to multiply and divide by six</p>
Block 3	<p><b>Using understanding of place value to add and subtract with three-digit numbers</b></p> <p>W1: Adding and subtracting one, ten and 100 with three-digit numbers</p> <p>W2: Using understanding of place value with three-digit numbers to add and subtract</p> <p>W3: Using understanding of place value with three-digit numbers to add and subtract</p> <p>W4: Using understanding of place value with three-digit numbers to add and subtract</p> <p>W5: Using understanding of place value with three-digit numbers to add and subtract including for 1000</p> <p>W6: Using understanding of place value with three-digit numbers to add and subtract</p>	<p><b>Using understanding of place value to add and subtract with four-digit numbers</b></p> <p>W1: Adding and subtracting one, ten, 100 and 1000 with four-digit numbers</p> <p>W2: Using understanding of place value with four-digit numbers to add and subtract</p> <p>W3: Using understanding of place value with four-digit numbers to add and subtract</p> <p>W4: Using understanding of place value with four-digit numbers to add and subtract</p> <p>W5: Using understanding of place value with four-digit numbers to add and subtract including for 1000</p> <p>W6: Applying understanding of place value with four-digit numbers to add and subtract</p>
Block 4	<p><b>Multiplicative understanding including using understanding of place value: twos, fours and eights</b></p> <p>W1: Connecting multiplication of two to multiplying four, eight, twenty and 200</p> <p>W2: Connecting multiplication of two to multiplying four, eight and twenty and connecting fours to eights</p> <p>W3: Connecting counting in twos to counting in fours, eights and twenties and counting in fours to counting in eights</p> <p>W4: Connecting counting in twos to counting in fours, eights and twenties and counting in fours to counting in eights</p> <p>W5: Connecting multiplying and dividing by two to multiplying and dividing by twenty and 200</p> <p>W6: Applying understanding of the connection between twos, fours and eights and understanding of place value to multiply and divide</p>	<p><b>Multiplicative understanding including factor pairs</b></p> <p>W1: Using understanding of multiplication facts to multiply seven</p> <p>W2: Using understanding of multiplication facts to multiply seven</p> <p>W3: Using understanding of factors and factor pairs</p> <p>W4: Linking counting to multiples of seven and using understanding of factors and factor pairs</p> <p>W5: Applying understanding to identify multiples and factors and to multiply and divide</p> <p>W6: Applying understanding to identify multiples and factors and to multiply and divide</p>
Block 5	<p><b>Using understanding of addition and subtraction facts with three-digit numbers</b></p> <p>W1: Adding and subtracting two, twenty and 200</p> <p>W2: Adding and subtracting ones, tens and hundreds</p> <p>W3: Adding and subtracting ones, tens and hundreds</p> <p>W4: Adding and subtracting ones, tens and hundreds</p> <p>W5: Applying understanding to add and subtract pairs of three-digit numbers</p> <p>W6: Applying understanding of adding and subtracting with three-digit numbers</p>	<p><b>Using understanding of addition and subtraction facts with four-digit numbers</b></p> <p>W1: Adding and subtracting two, twenty and 200</p> <p>W2: Adding and subtracting ones, tens, hundreds and thousands</p> <p>W3: Adding and subtracting ones, tens and hundreds</p> <p>W4: Adding and subtracting ones, tens, hundreds and thousands</p> <p>W5: Applying understanding of adding and subtracting with four-digit numbers</p> <p>W6: Applying understanding of adding and subtracting with four-digit numbers</p>
Block 6	<p><b>Multiplicative understanding including using understanding of place value: twos, threes, fours, fives, eights and ten</b></p> <p>W1: Connecting counting in threes, fours, fives and eights to counting in steps ten times the size</p> <p>W2: Connecting multiplying three to dividing by three, multiplying thirty and dividing by thirty</p> <p>W3: Connecting multiples of three to multiplying and dividing by three, thirty and 300</p> <p>W4: Connecting multiplying and dividing by three and five to multiplying and dividing by thirty and fifty</p> <p>W5: Applying understanding of multiplying by and dividing by three to multiplying by and dividing by thirty</p> <p>W6: Applying understanding of multiplying two, three, four, five eight and ten and understanding of place value to multiply and divide</p>	<p><b>Multiplicative understanding including using understanding of place value and multiplying three single-digit numbers</b></p> <p>W1: Connecting counting in fours, sixes, sevens and nines to counting in steps ten times the size</p> <p>W2: Exploring multiplying with three single-digit numbers</p> <p>W3: Using understanding to multiply three single-digit numbers</p> <p>W4: Applying understanding of multiplying and understanding of place value to multiply and divide</p> <p>W5: Applying understanding of multiplying and understanding of place value to multiply and divide</p> <p>W6: Applying understanding of multiplying and understanding of place value to multiply and divide</p>

# Years 5 and 6

	Year 5	Year 6
Block 1	<p><b>Using understanding of addition and subtraction facts to add and subtract with four-digit numbers</b></p> <p>W1: Using understanding of additive composition of ten for understanding other numbers</p> <p>W2: Using understanding of additive composition of ten for understanding other numbers</p> <p>W3: Adding and subtracting ones, tens, hundreds and thousands</p> <p>W4: Adding and subtracting ones, tens, hundreds and thousands</p> <p>W5: Applying understanding of adding and subtracting with four-digit numbers</p> <p>W6: Applying understanding of adding and subtracting with four-digit numbers</p>	<p><b>Using understanding of addition and subtraction facts, with whole and decimal numbers</b></p> <p>W1: Using understanding of the additive composition of 100 for adding and subtracting hundredths</p> <p>W2: Adding and subtracting ones, tenths and hundredths</p> <p>W3: Using understanding of additive composition of ten for large numbers and decimal numbers in the context of measures</p> <p>W4: Applying understanding of adding and subtracting with decimal numbers</p> <p>W5: Applying understanding of adding and subtracting with decimal numbers</p> <p>W6: Applying understanding of adding and subtracting with large numbers and decimal numbers</p>
Block 2	<p><b>Multiplicative understanding including using understanding of place value</b></p> <p>W1: Using counting in sevens and place value to count in larger steps; using understanding to multiply three single-digit numbers</p> <p>W2: Linking counting to multiples of six, seven and eight</p> <p>W3: Applying understanding of multiplying and understanding of place value to multiply and divide</p> <p>W4: Applying understanding of multiplying and understanding of place value to multiply and divide</p> <p>W5: Multiplicative properties of numbers</p> <p>W6: Applying understanding of multiplying, understanding of place value and understanding of properties of numbers to multiply and divide</p>	<p><b>Using multiplicative understanding and understanding of the order of operations</b></p> <p>W1: Using multiplication facts and understanding of place value to multiply and divide</p> <p>W2: Using multiplication facts and understanding of place value to multiply and divide</p> <p>W3: Applying understanding of properties of numbers</p> <p>W4: Applying understanding of the order of operations</p> <p>W5: Applying understanding of properties of numbers and the order of operations</p> <p>W6: Applying understanding of the order of operations</p>
Block 3	<p><b>Using understanding of place value to add and subtract with decimal numbers</b></p> <p>W1: Adding and subtracting one, one tenth and one hundredth with decimal numbers</p> <p>W2: Using understanding of place value with decimal numbers to add and subtract</p> <p>W3: Using understanding of place value with decimal numbers to add and subtract</p> <p>W4: Using understanding of place value with decimal numbers to add and subtract</p> <p>W5: Using understanding of place value with decimal numbers to add and subtract</p> <p>W6: Applying understanding of place value with decimal numbers to add and subtract</p>	<p><b>Using understanding of place value to add and subtract with large numbers and decimal numbers</b></p> <p>W1: Applying understanding of place value with decimal numbers to add and subtract</p> <p>W2: Applying understanding of place value with decimal numbers to add and subtract</p> <p>W3: Applying understanding of place value with large numbers to add and subtract</p> <p>W4: Applying understanding of place value with decimal numbers to add and subtract</p> <p>W5: Applying understanding of place value with large and decimal numbers to add and subtract</p> <p>W6: Applying understanding of place value with large and decimal numbers to add and subtract</p>
Block 4	<p><b>Understanding of the multiplicative structure of the number system: whole numbers and decimals</b></p> <p>W1: Multiplying and dividing by ten, 100 and 1000</p> <p>W2: Multiplying and dividing by ten, 100 and 1000</p> <p>W3: Multiplying and dividing by ten, 100 and 1000</p> <p>W4: Using understanding of multiplying and dividing by ten, 100 and 1000 to convert measures</p> <p>W5: Applying understanding of multiplying and dividing by ten in the context of measures</p> <p>W6: Applying understanding to identify multiples and factors and to multiply and divide</p>	<p><b>Understanding and using equivalence between fractions, decimals and percentages of numbers and quantities</b></p> <p>W1: Using counting to connect fractions, decimals and percentages</p> <p>W2: Identifying and demonstrating equivalence between fractions, decimals and percentages</p> <p>W3: Approximating fractions and percentages and identifying easy equivalences</p> <p>W4: Applying understanding of equivalence between fractions, decimals and percentages</p> <p>W5: Applying understanding of equivalence between fractions, decimals and percentages</p> <p>W6: Applying understanding of equivalence between fractions, decimals and percentages</p>
Block 5	<p><b>Using understanding of addition and subtraction facts with decimal numbers</b></p> <p>W1: Adding and subtracting ones, tenths and hundredths</p> <p>W2: Adding and subtracting ones, tenths and hundredths</p> <p>W3: Using understanding of adding and subtracting one, ten and 100 to add and subtract decimal numbers</p> <p>W4: Applying understanding of adding and subtracting with decimal numbers</p> <p>W5: Applying understanding of adding and subtracting with decimal numbers</p> <p>W6: Applying understanding of adding and subtracting with decimal numbers</p>	<p><b>Using understanding of addition and subtraction facts with decimal numbers</b></p> <p>W1: Adding and subtracting ones, tenths, hundredths and thousandths</p> <p>W2: Adding and subtracting ones, tenths, hundredths and thousandths</p> <p>W3: Using understanding of adding and subtracting one, ten and 100 to add and subtract decimal numbers</p> <p>W4: Applying understanding of adding and subtracting with decimal numbers</p> <p>W5: Applying understanding of adding and subtracting with decimal numbers</p> <p>W6: Applying understanding of adding and subtracting with decimal numbers</p>
Block 6	<p><b>Understanding the multiplicative composition of numbers</b></p> <p>W1: Understanding common factors, common multiples, square and cube numbers</p> <p>W2: Exploring factors</p> <p>W3: Understanding multiplication in relation to square numbers, cube numbers and volume</p> <p>W4: Applying understanding of common factors, common multiples, square and cube numbers</p> <p>W5: Applying understanding of factors, multiples, square and cube numbers</p> <p>W6: Using understanding of square and cube numbers to count</p>	<p><b>Understanding the multiplicative composition of numbers</b></p> <p>W1: Understanding common factors, common multiples, square and cube numbers</p> <p>W2: Exploring factors</p> <p>W3: Understanding multiplication in relation to square numbers, cube numbers and volume</p> <p>W4: Applying understanding of common factors, common multiples, square and cube numbers</p> <p>W5: Exploring lowest common multiples</p> <p>W6: Using understanding of square and cube numbers to count</p>

## Block 3: Additive composition of ten

This block focuses on understanding the cardinal value of ten. The activities focus primarily on understanding how ten can be partitioned (is additively composed) as the foundation for understanding addition and subtraction facts.

### Block 3 Week 1: Recognising additive composition of ten

Session	Block 3 Week 1 Session 1
Session focus	<i>Additive composition of ten</i>
Resources	<b>1.26, 1.27 (birds)</b>
Teaching activity	<p>Put pupils into pairs and show them the picture of the yellow and blue birds. Ask them to talk in pairs and agree how many birds there are altogether. Ask pupils to put their thumbs up when they have decided on the answer.</p> <p>When many/all pupils are ready, say: <i>I can see five blue birds on one branch and five yellow birds on another branch. Five blue birds and five yellow birds equals ten birds altogether.</i> Write <math>5 + 5 = 10</math> on the board to match what is being said.</p> <p>Ask pupils to read the calculation in unison in the context of the picture, as you have just modelled. Ask:</p> <ul style="list-style-type: none"> <li>• <i>What does each five represent?</i></li> <li>• <i>What does the ten represent?</i></li> </ul> <p>Tell pupils that all the blue birds fly away. Ask pupils to talk to their partners and agree how many birds are left behind. When many/all pupils have decided on the answer, say: <i>There were ten birds and five flew away so there were five birds left.</i> Write <math>10 - 5 = 5</math> on the board to match what is being said.</p> <p>Ask pupils to read the calculation in unison in the context of the picture, as you have just modelled. Ask:</p> <ul style="list-style-type: none"> <li>• <i>What does the ten represent?</i></li> <li>• <i>What does the 'subtract five' represent?</i></li> <li>• <i>What does the five on the end represent?</i></li> </ul> <p>Repeat with the picture of the green and red birds.</p>

<b>Session</b>	<b>Block 3 Week 1 Session 2</b>
<b>Session focus</b>	<i>Additive composition of ten</i>
<b>Resources</b>	<b>1.28 (birds), 1.29 (calculation cards)</b>
<b>Teaching activity</b>	<p>Put pupils into pairs and give each pair a set of calculation cards. Show pupils the picture of the birds and ask them to decide which of their cards matches the four yellow birds and six blue birds. Ask them to hold up their chosen cards.</p> <p>Agree that both additions show the ten birds and model the equivalence by writing <math>6 + 4 = 4 + 6</math> on the board. Say: <i>Six add four is the same as four add six.</i> Pupils should repeat this statement. Ask:</p> <ul style="list-style-type: none"> <li>• <i>What does the six on the left represent? And on the right?</i></li> <li>• <i>What does the four on the left represent? And on the right?</i></li> </ul> <p>Tell pupils that the six blue birds all fly away to a bird table in the next garden, leaving the four yellow birds behind. Ask pupils to decide which of their cards matches this story. When many/all pairs are ready, ask them to hold up their chosen cards. Agree that <math>10 - 6 = 4</math> matches the story. Ask:</p> <ul style="list-style-type: none"> <li>• <i>What does the ten represent?</i></li> <li>• <i>What does the 'subtract six' represent?</i></li> <li>• <i>What does the four represent?</i></li> </ul> <p>Show the calculation card <math>10 - 4 = 6</math> with the picture. Ask:</p> <ul style="list-style-type: none"> <li>• <i>What might happen so that four birds go and six are left behind?</i></li> </ul> <p>Ask pupils to put their thumbs up when they have agreed on the answer. When they are ready, choose pupils to give their matching story – for example, <i>There were ten birds, then four yellow birds flew away to build a nest and six blue birds were left behind.</i></p>

<b>Session</b>	<b>Block 3 Week 1 Session 3</b>
<b>Session focus</b>	<i>Additive composition of ten</i>
<b>Resources</b>	<b>1.30 (birds), 1.31 (calculation cards)</b>
<b>Teaching activity</b>	<p>Put pupils into pairs and give each pair a set of calculation cards. Show pupils the picture of the birds. Ask them to decide which of their cards matches that there are three yellow birds and seven blue birds. Ask them to hold up their chosen cards.</p> <p>Agree that both additions show the ten birds and model the equivalence by writing <math>7 + 3 = 3 + 7</math> on the board. Say: <i>Seven add three is the same as three add seven.</i> Ask pupils to repeat the statement.</p> <p>Tell pupils that the seven blue birds all flew away because they were scared of a cat, leaving the three yellow birds behind. Ask pupils to agree in their pairs which of their cards matches this story, then hold up their chosen cards. Agree that <math>10 - 7 = 3</math> matches the story. Ask:</p> <ul style="list-style-type: none"> <li>• <i>What does the ten represent?</i></li> <li>• <i>What does the 'subtract seven' represent?</i></li> <li>• <i>What does the three represent?</i></li> </ul> <p>Show the calculation card <math>10 - 3 = 7</math> with the picture. Ask:</p> <ul style="list-style-type: none"> <li>• <i>What might happen so that three birds go and seven are left behind?</i></li> </ul> <p>Ask some pupils to share their stories to match the calculation and the picture.</p>

<b>Session</b>	<b>Block 3 Week 1 Session 4</b>
<b>Session focus</b>	<i>Additive composition of ten</i>
<b>Resources</b>	<b>1.32 (birds), 1.33 (calculation cards)</b>
<b>Teaching activity</b>	<p>Put pupils into pairs and give each pair a set of calculation cards. Show pupils the picture of the birds. Ask them to decide which of their cards matches that there are two yellow birds and eight blue birds. When they are ready, they should hold up their chosen cards.</p> <p>Agree that both additions show the ten birds and model the equivalence by writing <math>8 + 2 = 2 + 8</math> on the board. Say: <i>Eight add two is the same as two add eight.</i> Ask pupils to repeat the statement.</p> <p>Tell pupils that the eight blue birds all fly away because they see some blackberries to eat, leaving the two yellow birds behind. Ask pupils to agree in their pairs which of their cards matches this story, then hold up their chosen cards. Agree that <math>10 - 8 = 2</math> matches the story. Ask:</p> <ul style="list-style-type: none"> <li>• <i>What does the ten represent?</i></li> <li>• <i>What does the 'subtract eight' represent?</i></li> <li>• <i>What does the two represent?</i></li> </ul> <p>Show the calculation card <math>10 - 2 = 8</math> with the picture. Ask:</p> <ul style="list-style-type: none"> <li>• <i>What might happen so that two birds go and eight are left behind?</i></li> </ul> <p>Ask some pupils to share their stories to match the calculation and the picture.</p>
<b>Session</b>	<b>Block 3 Week 1 Session 5</b>
<b>Session focus</b>	<i>Additive composition of ten</i>
<b>Resources</b>	<b>1.34 (birds), 1.35 (calculation cards)</b>
<b>Teaching activity</b>	<p>Put pupils into pairs and give each pair a set of calculation cards. Show pupils the picture of the birds. Ask them to decide which of their cards matches that there is one yellow bird and nine blue birds. When they are ready, they should hold up their chosen cards.</p> <p>Agree that both additions show the ten birds and model the equivalence by writing <math>9 + 1 = 1 + 9</math> on the board. Say: <i>Nine add one is the same as one add nine.</i> Ask pupils to repeat the statement.</p> <p>Tell pupils that the nine blue birds all fly away to spend the winter in Africa, leaving the one yellow bird behind. Ask pupils to agree in their pairs which of their cards matches this story, then hold up their chosen cards. Agree that <math>10 - 9 = 1</math> matches the story. Ask:</p> <ul style="list-style-type: none"> <li>• <i>What does the ten represent?</i></li> <li>• <i>What does the 'subtract nine' represent?</i></li> <li>• <i>What does the one represent?</i></li> </ul> <p>Show the calculation card <math>10 - 1 = 9</math> with the picture and ask:</p> <ul style="list-style-type: none"> <li>• <i>What might happen so that one bird goes and nine are left behind?</i></li> </ul> <p>Ask some pupils to share their stories to match the calculation and the picture.</p>

## 1.25 Block 2 – Week 6 – Sessions 4, 5

$$5 - 1 = 4$$

$$5 - 2 = 3$$

$$5 - 3 = 2$$

$$5 - 4 = 1$$

## 1.26 Block 3 – Week 1 – Session 1



## 1.27 Block 3 – Week 1 – Session 1



## 1.28 Block 3 – Week 1 – Session 2



## 1.29 Block 3 – Week 1 – Session 2

$$4 + 6 = 10$$

$$6 + 4 = 10$$

$$10 - 6 = 4$$

$$10 - 4 = 6$$

## 1.30 Block 3 – Week 1 – Session 3



## 1.31 Block 3 – Week 1 – Session 3

$$3 + 7 = 10$$

$$7 + 3 = 10$$

$$10 - 7 = 3$$

$$10 - 3 = 7$$

## 1.32 Block 3 – Week 1 – Session 4



## 1.33 Block 3 – Week 1 – Session 4

$$2 + 8 = 10$$

$$8 + 2 = 10$$

$$10 - 8 = 2$$

$$10 - 2 = 8$$

## 1.34 Block 3 – Week 1 – Session 5



## 1.35 Block 3 – Week 1 – Session 5

$$1 + 9 = 10$$

$$9 + 1 = 10$$

$$10 - 9 = 1$$

$$10 - 1 = 9$$

## Block 3 Week 1: Adding and subtracting one, ten and 100 with three-digit numbers

<b>Session</b>	<b>Block 3 Week 1 Session 1</b>
<b>Session focus</b>	<i>Using understanding of place value to add and subtract with three-digit numbers</i>
<b>Resources</b>	<b>3.25 ('+ 1' card), 3.26 (language cards), money pot, twelve one-pound coins</b>
<b>Teaching activity</b>	<p>Tell pupils that you have saved some money and write £295 on the board. Say that you have some one-pound coins to put in your money pot to add to your savings and that you are going to count together how much money you have saved. Count, adding all the coins and then show the '+ 1' card and ask:</p> <ul style="list-style-type: none"> <li>• <i>What different ways might we say that one pound is being added?</i></li> </ul> <p>Use the language cards 'one more', 'add one', 'plus one', and any other language that fits with the maths and the context that pupils have suggested, for example, 'saving another pound'. Ask:</p> <ul style="list-style-type: none"> <li>• <i>When we had 299 pounds and we added another pound, how much did we have? How do you know? Can you write a number sentence to match?</i></li> <li>• <i>Can you explain your number sentence to your partner, using some of the language on the board?</i></li> <li>• <i>Can you explain your number sentence back in the story of my savings?</i></li> </ul> <p>Write <math>299 + 1 = 300</math> and ask pupils to share their explanations of the calculation in the context of saving money. Ask other pupils to repeat what is said and to say whether or not they agree and why. Repeat for other numbers. Ask if there are any numbers that are tricky for adding one and make a note of them.</p>
<b>Session</b>	<b>Block 3 Week 1 Session 2</b>
<b>Session focus</b>	<i>Using understanding of place value to add and subtract with three-digit numbers</i>
<b>Resources</b>	<b>3.25 ('- 1' card), 3.27 (language cards), money pot, twelve one-pound coins</b>
<b>Teaching activity</b>	<p>Remind pupils that you have saved some money and write £509 on the board. Explain that you need to spend some money and are going to take some one-pound coins out of your pot. Say that you are going to count together to keep track of how much money you have left as you take out the one-pound coins. Count, taking the twelve coins out of the pot and then show the '- 1' card and ask:</p> <ul style="list-style-type: none"> <li>• <i>What different ways might we say that one pound was being subtracted?</i></li> </ul> <p>Use the language cards 'subtract one', 'take away one', 'minus one', 'one less' and any other language that fits with the maths and the context that pupils have suggested – for example, 'spending one pound'. Read the words together. Ask:</p> <ul style="list-style-type: none"> <li>• <i>When we had 500 pounds and I removed one pound, how much did I have left? How do you know? Can you write a number sentence to match?</i></li> <li>• <i>Can you explain your number sentence to your partner, using some of the language on the board?</i></li> <li>• <i>Can you explain your number sentence back in the story of my savings?</i></li> </ul> <p>Write <math>500 - 1 = 499</math> and ask pupils to share their explanations of the calculation in the context of spending money. Ask other pupils to repeat what is said and to say whether or not they agree and why. Repeat for other numbers. Ask if there are any numbers that are tricky for subtracting one, and make a note of them.</p>

<b>Session</b>	<b>Block 3 Week 1 Session 3</b>
<b>Session focus</b>	<i>Using understanding of place value to add and subtract with three-digit numbers</i>
<b>Resources</b>	<b>3.25 ('+ 10' card), 3.26 (language cards), money pot, ten-pound note</b>
<b>Teaching activity</b>	<p>Put the language cards from Session 1 on the board and write £678. Tell pupils that you have been raising money for a charity and this is how much you have raised so far. Say that you organised a charity quiz night and each team paid ten pounds. Show pupils the ten-pound note and ask:</p> <ul style="list-style-type: none"> <li>• <i>Can you count to keep track of how much money I have raised as I add ten pounds each time to the pot?</i></li> </ul> <p>Count, pretending to add the ten-pound note each time, until you reach 728. Show the '+ 10' card and ask:</p> <ul style="list-style-type: none"> <li>• <i>What different ways might we say that ten pounds is being added?</i></li> <li>• <i>Can we use the language from the first session to help us?</i></li> </ul> <p>Agree that the language cards can be used by changing 'one' to 'ten'. Write the new phrases on the board. Ask:</p> <ul style="list-style-type: none"> <li>• <i>When we had 698 pounds and we added ten pounds, how much did we have? How do you know? Can you write a number sentence to match?</i></li> <li>• <i>Can you explain your number sentence to your partner, using some of the language on the board?</i></li> <li>• <i>Are there any numbers that are tricky for adding ten? What about 996?</i></li> </ul> <p>Make a note of the tricky numbers.</p>

<b>Session</b>	<b>Block 3 Week 1 Session 4</b>
<b>Session focus</b>	<i>Using understanding of place value to add and subtract with three-digit numbers</i>
<b>Resources</b>	<b>3.25 ('- 10' card), 3.27 (language cards), money pot, ten-pound note</b>
<b>Teaching activity</b>	<p>Put the language cards from Session 2 on the board and write £836. Tell pupils that this is how much money you have raised so far, and some of the money you have raised is going to pay for some children to have medicine. Say that the medicine costs ten pounds for each child. Ask:</p> <ul style="list-style-type: none"> <li>• <i>Can you count to keep track of how much money there is left as we spend ten pounds?</i></li> </ul> <p>Count, pretending to take out ten pounds each time until you reach 776. Show the '- 10' card and ask:</p> <ul style="list-style-type: none"> <li>• <i>What different ways might we say that ten pounds has been spent?</i></li> <li>• <i>Can we use the language from the second session to help us?</i></li> </ul> <p>Agree that the language cards can be used by changing 'one' to 'ten'. Write the new phrases on the board. Ask:</p> <ul style="list-style-type: none"> <li>• <i>When we had 806 pounds and we took out ten pounds, how much did we have left? How do you know? Can you write a number sentence to match?</i></li> <li>• <i>Can you explain your number sentence to your partner, using some of the language on the board?</i></li> <li>• <i>Are there any numbers that are tricky for subtracting ten? What about 1007?</i></li> </ul> <p>Make a note of the tricky numbers.</p>

<b>Session</b>	<b>Block 3 Week 1 Session 5</b>
<b>Session focus</b>	<i>Using understanding of place value to add and subtract with three-digit numbers</i>
<b>Resources</b>	<b>3.25 ('+ 100' and '- 100' cards), 3.26, 3.27 (language cards)</b>
<b>Teaching activity</b>	<p>Write £45 on the board and tell pupils that this is how much you have raised for a new charity you are supporting. Say that you are going to spend ten days raising money for the charity by swimming five miles each day. Explain that this will raise 100 pounds each day. Ask:</p> <ul style="list-style-type: none"> <li>• <i>Can you count to keep track of how much money I will have raised as I raise 100 pounds each day for ten days?</i></li> </ul> <p>Count until you have added 100 ten times. Write £1045 on the board and show the '+ 100' card. Ask:</p> <ul style="list-style-type: none"> <li>• <i>What different ways might we say that 100 pounds is being added?</i></li> <li>• <i>Can we use the language from the first session to help us?</i></li> </ul> <p>Agree that the language cards can be used by changing 'one' to '100'. Write the new phrases on the board. Ask:</p> <ul style="list-style-type: none"> <li>• <i>When we had 945 pounds and we added 100 pounds, how much did we have? How do you know?</i></li> <li>• <i>Can you write a number sentence to match?</i></li> <li>• <i>Can you explain your number sentence to your partner using some of the language on the board?</i></li> </ul> <p>Say that you are now going to use the 1045 pounds to sponsor pupils in school and that it costs 100 pounds to sponsor each child. Ask:</p> <ul style="list-style-type: none"> <li>• <i>Can you count to keep track of how much money there is left as we spend 100 pounds?</i></li> </ul> <p>Count until you reach forty-five pounds. Show the '- 100' card and ask:</p> <ul style="list-style-type: none"> <li>• <i>What different ways might we say that 100 pounds has been spent?</i></li> <li>• <i>Can we use the language from the second session to help us?</i></li> </ul> <p>Agree that the language cards can be used by changing 'one' to 'one hundred'. Ask:</p> <ul style="list-style-type: none"> <li>• <i>When we had 1045 pounds and we spent 100 ten pounds, how much did we have left? How do you know?</i></li> <li>• <i>Can you write a number sentence to match?</i></li> <li>• <i>Can you explain your number sentence to your partner, using some of the language on the board?</i></li> <li>• <i>Are there any numbers that are tricky for adding and subtracting 100?</i></li> </ul>

**3.24 Block 2 – Week 4 – Session 5**

**I bought ten packets of sweets with eighty sweets in each packet.**

**Chairs in the school hall are set out in rows of ten. There are eighty people to seat.**

**The cook made eighty biscuits and had ten bags to put them in for selling.**

**I saved up eighty pounds and then spent ten pounds on a new dress.**

**3.25 Block 3 – Week 1 – Sessions 1–5**

<b>+ 1</b>	<b>- 1</b>
<b>+ 10</b>	<b>- 10</b>
<b>+ 100</b>	<b>- 100</b>

**3.26 Block 3 – Week 1 – Sessions 1, 3, 5**

<b>one more</b>	<b>add one</b>	<b>plus one</b>
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**3.27 Block 3 – Week 1 – Sessions 2, 4, 5**

<b>one fewer</b>	<b>subtract one</b>	<b>take away one</b>
<b>minus one</b>	<b>one less</b>	

**3.28 Block 3 – Week 2 – Sessions 1, 2**

<b>Target board</b>			
<b>140</b>	<b>306</b>	<b>728</b>	<b>599</b>
<b>208</b>	<b>611</b>	<b>893</b>	<b>404</b>
<b>970</b>	<b>765</b>	<b>291</b>	<b>304</b>
<b>520</b>	<b>639</b>	<b>492</b>	<b>806</b>

<b>Session</b>	<b>Block 4 Week 4 Session 5</b>
<b>Session focus</b>	<i>Understanding and using equivalence between fractions, decimals and percentages of numbers and quantities</i>
<b>Resources</b>	<b>None needed</b>
<b>Teaching activity</b>	<p>Put pupils into pairs and write 840 on the board. Ask:</p> <ul style="list-style-type: none"> <li>• <i>Can you and your partner find a fraction of this number? Can you record an equivalent multiplication with a decimal number and a statement with a percentage that matches?</i></li> </ul> <p>Ask pupils for their suggestions and write them on the board. Ask:</p> <ul style="list-style-type: none"> <li>• <i>Do you agree with these suggestions? How do you know if they are correct/incorrect?</i></li> <li>• <i>Can you explain to your partner?</i></li> </ul>

## Block 4 Week 5: Applying understanding of equivalence between fractions, decimals and percentages

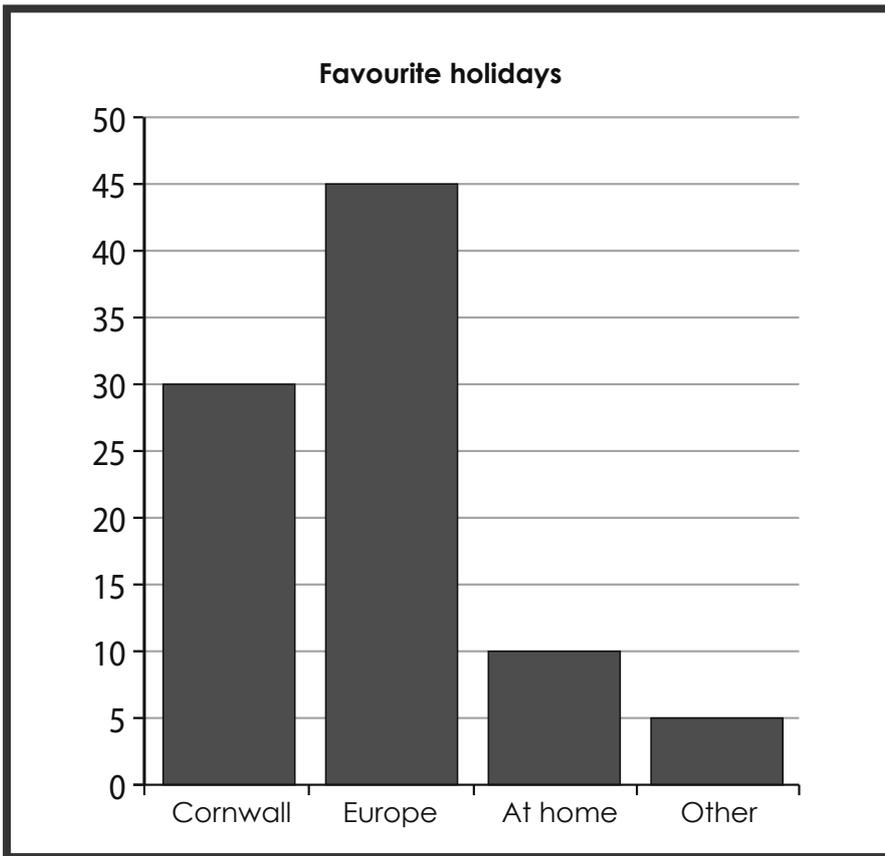
<b>Session</b>	<b>Block 4 Week 5 Session 1</b>
<b>Session focus</b>	<i>Understanding and using equivalence between fractions, decimals and percentages of numbers and quantities</i>
<b>Resources</b>	<b>6.27 (decimal place value chart), 6.50 (target board), decimal place value counters, counters</b>
<b>Teaching activity</b>	<p>Put pupils into pairs or threes. Show them the target board and read out the distances together. Ask:</p> <ul style="list-style-type: none"> <li>• <i>Can you choose a distance from the target board that is less than one kilometre and write it down?</i></li> <li>• <i>How do you know your fraction is less than one?</i></li> <li>• <i>What is your fraction written as a decimal? How do you know?</i></li> <li>• <i>Can you explain your thinking to your partner, using a resource or drawing something to demonstrate your understanding?</i></li> </ul> <p>Look for pupils connecting the fractions with decimals and select some of them to share. Ask:</p> <ul style="list-style-type: none"> <li>• <i>Can you choose a distance from the target board that is greater than one kilometre and write it down?</i></li> <li>• <i>How do you know your fraction is greater than one?</i></li> <li>• <i>What is your fraction written as a decimal? How do you know?</i></li> <li>• <i>Can you explain your thinking to your partner, using a resource or drawing something to demonstrate your understanding?</i></li> <li>• <i>I have written the decimal 0.67. What fraction might match my decimal? Can you think of another fraction that would match?</i></li> </ul>

<b>Session</b>	<b>Block 4 Week 5 Session 2</b>
<b>Session focus</b>	<i>Understanding and using equivalence between fractions, decimals and percentages of numbers and quantities</i>
<b>Resources</b>	<b>6.27 (decimal place value chart), 6.51 (target board), decimal place value counters, counters</b>
<b>Teaching activity</b>	<p>Put pupils into pairs or threes. Show them the target board and read out the weights together. Ask:</p> <ul style="list-style-type: none"> <li>• Can you choose a weight from the board that is less than one kilogram and write it down?</li> <li>• How do you know your fraction is less than one?</li> <li>• Can you write another fraction that is equivalent to your fraction? And another? And another?</li> <li>• How do you know the fractions are equivalent?</li> <li>• Can you explain your thinking to your partner, using a resource or drawing something to demonstrate your understanding?</li> </ul> <p>Look for pupils connecting equivalent fractions and select some of them to share. For example, seven tenths is equal to seventy hundredths and 700 thousandths. Ask:</p> <ul style="list-style-type: none"> <li>• Can you choose a weight from the board that is greater than one kilogram and write it down? How do you know your fraction is greater than one?</li> <li>• Can you write another fraction that is equivalent to your fraction? And another? And a third?</li> <li>• How do you know the fractions are equivalent?</li> <li>• Can you explain your thinking to your partner, using a resource or drawing something to demonstrate your understanding?</li> </ul>
<b>Session</b>	<b>Block 4 Week 5 Session 3</b>
<b>Session focus</b>	<i>Understanding and using equivalence between fractions, decimals and percentages of numbers and quantities</i>
<b>Resources</b>	<b>6.52 (target board)</b>
<b>Teaching activity</b>	<p>Put pupils into pairs or threes. Show them the target board and read out the measures together. Ask:</p> <ul style="list-style-type: none"> <li>• Can you choose a capacity from the board that is less than one litre and write it down?</li> <li>• How do you know your decimal is less than one?</li> <li>• What is your decimal written as a fraction? How do you know? Is there another fraction you could have written? And another?</li> <li>• Can you explain your thinking to your partner, using a resource or drawing something to demonstrate your understanding?</li> </ul> <p>Look for pupils connecting the decimals to fractions and ask some of them to share. Ask:</p> <ul style="list-style-type: none"> <li>• Can you choose a capacity from the board that is greater than one litre and write it down? How do you know your decimal is greater than one?</li> <li>• What is your decimal written as a fraction? How do you know? Is there another fraction you could have written? And another?</li> <li>• Can you explain your thinking to your partner, using a resource or drawing something to demonstrate your understanding?</li> <li>• I have written the fraction <math>\frac{207}{1000}</math>. What decimal number matches my fraction? How do you know?</li> </ul>

<b>Session</b>	<b>Block 4 Week 5 Session 4</b>
<b>Session focus</b>	<i>Understanding and using equivalence between fractions, decimals and percentages of numbers and quantities</i>
<b>Resources</b>	<b>6.53 (target board)</b>
<b>Teaching activity</b>	<p>Put pupils into pairs or threes and tell them that you are thinking about how to use what you know about fractions and decimals to help find percentages of numbers. Show pupils the target board. Tell them that you are going to choose 10% and ask:</p> <ul style="list-style-type: none"> <li>• <i>What would you do to find ten per cent of a number? What fraction of the number would you have calculated?</i></li> </ul> <p>Listen for pupils explaining that they would divide by ten or find one tenth of the number and that this would be equivalent to ten per cent. Model recording <math>\div 10</math>, <math>\times \frac{1}{10}</math> and <math>\times 0.1</math>. Ask:</p> <ul style="list-style-type: none"> <li>• <i>Can you choose another percentage from the target board and record how you would find this percentage of a number? Can you think of another efficient way of working it out?</i></li> <li>• <i>Can you write down the fraction of the number you would be finding and explain your thinking to your partner, using symbols and drawings to support your explanation?</i></li> </ul>

<b>Session</b>	<b>Block 4 Week 5 Session 5</b>
<b>Session focus</b>	<i>Understanding and using equivalence between fractions, decimals and percentages of numbers and quantities</i>
<b>Resources</b>	<b>6.54 (target board)</b>
<b>Teaching activity</b>	<p>Put pupils into pairs or threes and show them the target board. Tell them that you are choosing two numbers that are equivalent and write <math>\frac{2}{10}</math> and 0.2 on the board. Say:</p> <ul style="list-style-type: none"> <li>• <i>I know these numbers are equivalent because the place to the right of the decimal point is the tenths and 0.2 has two in that place, so this is two tenths.</i></li> </ul> <p>Ask:</p> <ul style="list-style-type: none"> <li>• <i>Can you choose two numbers that you know are equivalent and explain to your partner how you know?</i></li> <li>• <i>If you were finding this fraction of a number, what percentage of the number would you be finding? How do you know?</i></li> <li>• <i>Can you tell a story involving your fraction or your percentage?</i></li> </ul> <p>Model a story if necessary – for example, <i>My family won 1000 pounds and we had to pay twenty per cent tax on the winnings, so we paid 200 pounds.</i></p>

## 6.49 Block 4 – Week 3 – Session 4



## 6.50 Block 4 – Week 5 – Session 1

<b>Target board</b>			
$\frac{12}{100}$ km	$\frac{78}{10}$ km	$\frac{23}{1000}$ km	$\frac{45}{100}$ km
$\frac{36}{10}$ km	$\frac{140}{100}$ km	$\frac{8}{10}$ km	$\frac{608}{100}$ km
$\frac{97}{100}$ km	$\frac{5}{100}$ km	$\frac{247}{100}$ km	$\frac{27}{10}$ km
$\frac{104}{100}$ km	$\frac{6}{100}$ km	$\frac{4}{10}$ km	$\frac{570}{100}$ km

## 6.51 Block 4 – Week 5 – Session 2

Target board			
$\frac{52}{100}$ kg	$\frac{64}{10}$ kg	$\frac{31}{1000}$ kg	$\frac{87}{100}$ kg
$\frac{45}{10}$ kg	$\frac{160}{100}$ kg	$\frac{7}{10}$ kg	$\frac{406}{100}$ kg
$\frac{93}{100}$ kg	$\frac{7}{100}$ kg	$\frac{247}{100}$ kg	$\frac{37}{10}$ kg
$\frac{108}{100}$ kg	$\frac{14}{100}$ kg	$\frac{5}{10}$ kg	$\frac{670}{100}$ kg

## 6.52 Block 4 – Week 5 – Session 3

Target board			
<b>0.49 l</b>	<b>3.24 l</b>	<b>4.08 l</b>	<b>5.1 l</b>
<b>0.6 l</b>	<b>17.02 l</b>	<b>0.09 l</b>	<b>0.91 l</b>
<b>1.09 l</b>	<b>9.2 l</b>	<b>0.511 l</b>	<b>8.605 l</b>
<b>4.38 l</b>	<b>0.702 l</b>	<b>0.36 l</b>	<b>2.03 l</b>

## 6.53 Block 4 – Week 5 – Session 4

Target board		
<b>10%</b>	<b>25%</b>	<b>5%</b>
<b>15%</b>	<b>60%</b>	<b>85%</b>
<b>9%</b>	<b>41%</b>	<b>75%</b>

## 6.54 Block 4 – Week 5 – Session 5

Target board			
<b><math>\frac{2}{10}</math></b>	<b>0.65</b>	<b><math>\frac{1}{4}</math></b>	<b>0.75</b>
<b>0.25</b>	<b><math>\frac{65}{100}</math></b>	<b>0.2</b>	<b><math>\frac{47}{100}</math></b>
<b><math>\frac{9}{100}</math></b>	<b>0.05</b>	<b><math>\frac{2}{5}</math></b>	<b>0.4</b>
<b><math>\frac{5}{100}</math></b>	<b>0.09</b>	<b>0.47</b>	<b><math>\frac{3}{4}</math></b>



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