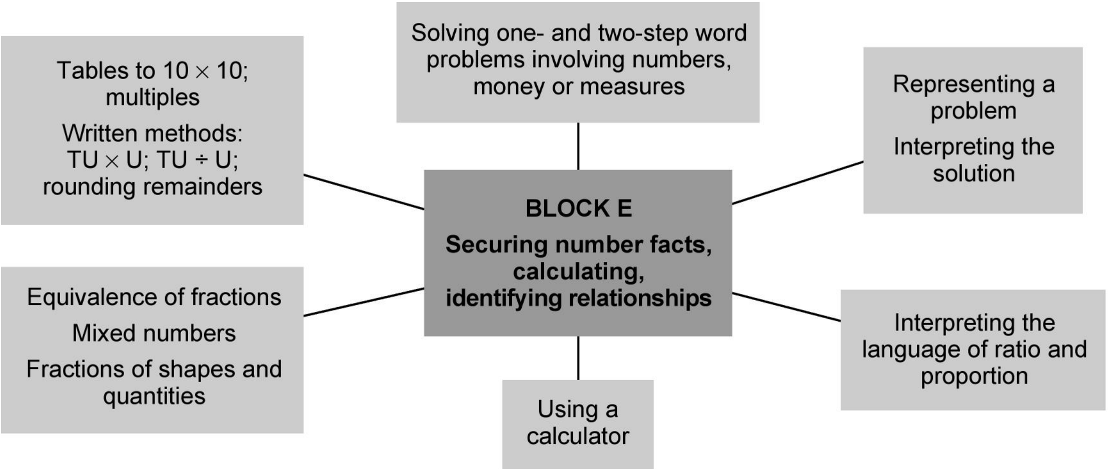
Securing number facts, calculating, identifying relationships



Objectives End-of-year expectations (key objectives) are highlighted	**Units** 1	2	3
• Represent a puzzle or problem using number sentences, statements or diagrams; use these to solve the problem; present and interpret the solution in the context of the problem	✓	✓	✓
• Derive and recall multiplication facts up to 10 × 10, the corresponding division facts and multiples of numbers to 10 up to the tenth multiple	✓	✓	✓
• Develop and use written methods to record, support and explain multiplication and division of two-digit numbers by a one-digit number, including division with remainders (e.g. 15 × 9, 98 ÷ 6)			✓
• Recognise the equivalence between decimal and fraction forms of one half, quarters, tenths and hundredths	✓	✓	✓
• Use diagrams to identify equivalent fractions (e.g. $\frac{6}{8}$ and $\frac{3}{4}$, or $\frac{70}{100}$ and $\frac{7}{10}$); interpret mixed numbers and position them on a number line (e.g. $3\frac{1}{2}$)	✓	✓	✓
• Identify pairs of fractions that total 1	✓	✓	
• Find fractions of numbers, quantities or shapes (e.g. $\frac{1}{5}$ of 30 plums, $\frac{3}{8}$ of a 6 by 4 rectangle)	✓	✓	✓
• Use the vocabulary of ratio and proportion to describe the relationship between two quantities (e.g. 'There are 2 red beads to every 3 blue beads, or 2 beads in every 5 beads are red'); estimate a proportion (e.g. 'About one quarter of the apples in the box are green')			✓

Speaking and listening objectives for the block

Objectives	**Units** 1	2	3
• Respond appropriately to the contributions of others in the light of alternative viewpoints	✓		

Objectives	Units		
	1	2	3
• Identify the main points of each speaker, compare their arguments and how they are presented		✓	
• Use time, resources and group members efficiently by distributing tasks, checking progress and making back-up plans			✓

Opportunities to apply mathematics in science

Activities		Units		
		1	2	3
4b	Habitats: Sort animals and plants according to own criteria. Select ways of recording their groupings. Where appropriate, use fractions to describe them, e.g. one quarter of the organisms are woodlice.	✓	✓	
4b	Habitats: Sort animals and plants according to own criteria and select ways of recording their groupings. Where appropriate, use language of ratio and proportion to describe them, e.g. 2 slugs for every beetle.			✓

Key aspects of learning: focus for the block

Enquiry	**Problem solving**	Reasoning	Creative thinking
Information processing	Evaluation	Self-awareness	**Managing feeling**
Social skills	**Communication**	Motivation	**Empathy**

Vocabulary

problem, solution, calculator, calculate, calculation, equation, operation, symbol, inverse, answer, method, explain, predict, reason, reasoning, pattern, relationship

add, subtract, multiply, multiplied by, divide, divided by, sum, total, difference, plus, minus, product, quotient, remainder, multiple, factor, divisor, divisible by

fraction, unit fraction, mixed number, numerator, denominator, equivalent

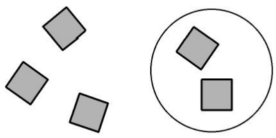
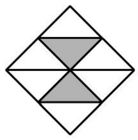
proportion, in every, for every, to every

Building on previous learning

Check that children can already:

- recall multiplication facts and derive related division facts for the 2, 3, 4, 5 and 10 times-tables
- read and write proper fractions, e.g. $\frac{3}{7}$, $\frac{9}{10}$
- understand the terms *denominator* (the parts of a whole) and *numerator* (the number of parts)
- find unit fractions of numbers and quantities, e.g. $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$ and $\frac{1}{6}$ of 12 litres
- find unit fractions of shapes
- use diagrams to compare the size of two unit fractions

Unit 4E1 — 3 weeks

Objectives *Children's learning outcomes in italic*	**Assessment for learning**
• Represent a puzzle or problem using number sentences, statements or diagrams; use these to solve the problem; present and interpret the solution in the context of the problem *I can write down number sentences or drawings to help me solve a problem* *When I have solved a problem I re-read the question to make sure the answer makes sense*	What could you write down or draw to help you to think about this problem? How can you check that your answer makes sense? Jan is 9 years old. Her mother is 31 years old. How many years older is Jan's mother? Which of these could you use to work out the answer? 40 – 31 31 + 9 31 × 9 31 – 9 40 – 9
• Derive and recall multiplication facts up to 10 × 10, the corresponding division facts and multiples of numbers to 10 up to the tenth multiple *I can tell you answers to the 2, 3, 4, 5, 6 and 10 times-tables, even when they are not in the right order* *If you give me a multiplication fact I can give you one or two division facts to go with it*	How does knowing your 3 times table help you to recall multiples of 6? Leila puts 4 seeds in each of her pots. She uses 6 pots and has 1 seed left over. How many seeds did she start with? Nineteen marbles are shared between some children. Each child receives six marbles and there is one marble left over. How many children share the marbles? How does 6 × 4 = 24 help you to know the answer to 6 × 40? And the answer to 240 ÷ 6?
• Use diagrams to identify equivalent fractions (e.g. $\frac{6}{8}$ and $\frac{3}{4}$, or $\frac{70}{100}$ and $\frac{7}{10}$); interpret mixed numbers and position them on a number line (e.g. $3\frac{1}{2}$) *I can use a fraction to describe a part of a whole* *I can show you on a diagram of a rectangle made from eight squares that one half is the same as two quarters or four eighths*	What fraction of these tiles is circled?  What fraction of the square is shaded?  Tell me some fractions that are equivalent to $\frac{1}{2}$. How do you know? Are there any others? The pizza was sliced into six equal slices. I ate two of the slices. What fraction of the pizza did I eat?
• Recognise the equivalence between decimal and fraction forms of one half, quarters, tenths and hundredths *I know that two quarters, five tenths and fifty hundredths are the same as one half*	Tell me two fractions that are the same as 0.5. Are there any other possibilities? How many pence are the same as £0.25? How many hundredths are the same as 0.25? How else could you write twenty-five hundredths? You have been using your calculator to find an answer. The answer on the display reads 8.5. What could this mean? Which of these fractions is the same as 0.5? $\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$ $\frac{3}{4}$
• Identify pairs of fractions that total 1 *Using diagrams, I can find pairs of fractions that make 1 whole*	Use this 3 by 4 rectangle to find two fractions that add up to 1.

Objectives *Children's learning outcomes in italic*	**Assessment for learning**
• Find fractions of numbers, quantities or shapes (e.g. $\frac{1}{5}$ of 30 plums, $\frac{3}{8}$ of a 6 by 4 rectangle) *I can find a fraction of a shape drawn on squared paper* *I can find a fraction of a number of cubes by sharing them in equal groups*	How can you find $\frac{1}{3}$ of 27? Is there more than one way to shade $\frac{2}{3}$ of a 2 by 6 grid? Why?
• Respond appropriately to the contributions of others in the light of alternative viewpoints *I can listen to different ways that people have solved problems and decide which way is the most helpful for me*	Did anyone solve the problem in a different way? Which do you think was the best way to solve the problem? Why? If you were given another problem like this, would you use that method? Why or why not?

Learning overview

Children **count on and back from zero** in steps of 2, 3, 4, 5, 6 and 10 to answer questions like: *What is 6 multiplied by 8?* and *How many 4s make 36?*

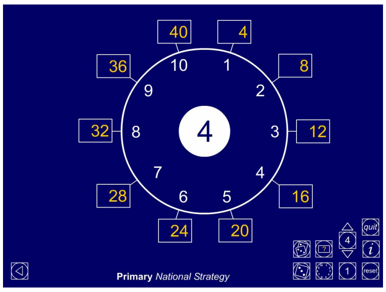
Children **derive and recall multiplication facts for the 2, 3, 4, 5, 6 and 10 times-tables** and are able to state corresponding division facts. They use these facts to answer questions like:

A box holds 6 eggs. How many eggs are in 7 boxes?

What number when divided by 6 gives an answer of 4?

Leila puts 4 seeds in each of her pots. She uses 6 pots and has 1 seed left over. How many seeds did she start with?

Children **investigate patterns and relationships**. For example, they add together the digits of any multiple of 3 and generalise to help them recognise two- and three-digit multiples of 3. Using the 'Number dials' ITP they recognise that they can use their knowledge of number facts and place value to derive new facts; for example, by knowing 8 × 4 = 32 they can derive the answers to 80 × 4 and 320 ÷ 4.



Children **solve problems** using knowledge of multiplication facts. For example, they use their knowledge of multiples of 2, 3 and 5 to tackle this problem:

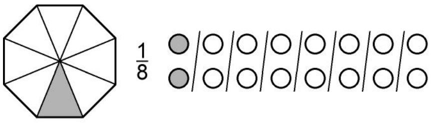
Little has size 2 boots, Middle has size 3 boots and Big has size 5 boots. They all start with the heels of their boots on the same line and walk heel to toe. When will all their heels be in line again?

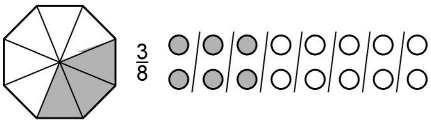
They decide what form of recording they will use to **represent the problem** and then evaluate their ideas, showing empathy with others.

Children **read, write and understand fraction notation**. For example, they read and write $\frac{1}{10}$ as one tenth. They recognise that unit fractions such as $\frac{1}{4}$ or $\frac{1}{5}$ represent one part of a whole. They extend this to recognise fractions that represent several parts of a whole, and represent these fractions on diagrams. Using visual representations, such as a fraction wall, children look at ways of making one whole. They recognise that one whole is equivalent to two halves, three thirds, four quarters, five fifths. Using this knowledge they begin to identify **pairs of fractions that total 1**, such as $\frac{1}{3} + \frac{2}{3}$, $\frac{1}{4} + \frac{3}{4}$. They solve simple problems, such as: *I have eaten $\frac{3}{10}$ of my bar of chocolate. What fraction do I have left to eat?*

Children begin to recognise the **equivalence between some fractions**. They fold a number line from 0 to 1 in half and half again and label the $\frac{1}{4}$ divisions. They then fold it again and identify the eighths. From this they establish the equivalences between halves, quarters and eighths. Using a 0 to 1 line marked with 10 divisions, they mark on fifths and tenths and again establish equivalences such as $\frac{2}{10}$ and $\frac{1}{5}$. They also represent these equivalences by shading shapes that have been divided into equal parts.

Children **find fractions of shapes**. For example they shade $\frac{3}{8}$ of an octagon, understanding that any 3 of the 8 triangles can be shaded.



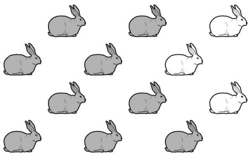
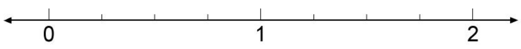


Working practically using objects, they find $\frac{1}{3}$ of 12 pencils or $\frac{1}{8}$ of 16 cubes, then **present this pictorially**. They make links between fractions and division, realising that when they find $\frac{1}{5}$ of an amount they are dividing it into 5 equal groups. They recognise that finding one half is equivalent to dividing by 2, so that $\frac{1}{2}$ of 16 is equivalent to 16 ÷ 2. They understand that when one whole cake is divided equally into 4, each person gets one quarter, or $1 \div 4 = \frac{1}{4}$.

Children explore the equivalence between tenths and hundredths, and link this to their work on place value. They cut a 10 by 10 square into ten strips to find tenths, and observe that 1 tenth is equivalent to 10 hundredths, or that 4 tenths and 3 hundredths is equivalent to 43 hundredths. They note that 43p, or £0.43, is 4 lots of 10p and 3 lots of 1p. They record in both fraction and decimal form:

$$0.43 = 0.4 + 0.03 = \frac{4}{10} + \frac{3}{100}$$

Unit 4E2 — 3 weeks

Objectives *Children's learning outcomes in italic*	**Assessment for learning**
• Represent a puzzle or problem using number sentences, statements or diagrams; use these to solve the problem; present and interpret the solution in the context of the problem *I can write down number sentences or drawings to help me solve a problem* *When I have solved a problem I re-read the question to make sure the answer makes sense*	What could you write down or draw to help you to think about this problem? One length of the swimming pool is 25 metres. Jane swims 5 lengths of the pool. How far does Jane swim altogether? How can you check that your answer makes sense? Look at this problem. Jan is 9 years old. Her mother is 31 years old. How many years older is Jan's mother? Circle which of these you could use to work out the answer. 40 – 31 31 + 9 31 × 9 31 – 9 40 – 9
• Derive and recall multiplication facts up to 10 × 10, the corresponding division facts and multiples of numbers to 10 up to the tenth multiple *I can tell you answers to the 7 times-tables, even when they are not in the right order* *If you give me a multiplication fact I can give you one or two division facts to go with it*	Count from zero in sevens. If someone has forgotten the 7 times-table, what tips would you give them to help work it out? How could you work out the 7 times-table from the 5 and 2 times-tables? How could you work it out from the 10 and 3 times-tables? How else could you work it out? You know that 2 + 5 = 7. How could you work out 8 × 7 from this addition fact? Are there any multiples of 7 that are also multiples of 8? Which multiples of 7 are the hardest to remember? What can you do to help you remember them?
• Recognise the equivalence between decimal and fraction forms of one half, quarters, tenths and hundredths *I can recognise decimals and fractions that are equivalent*	Which of these is the same as 0.4? A four B four tenths C four hundredths D one fourth Tell me two fractions that are the same as 0.25. Are there any other possibilities? How many centimetres are the same as 0.75 m? How many hundredths are the same as 0.75? How else could you write seventy-five hundredths? You have been using your calculator to find an answer. The answer on the display reads 8.25. What could this mean? Write down a number lying between 7 and 8. Write it as a fraction and then as a decimal.
• Use diagrams to identify equivalent fractions (e.g. $\frac{6}{8}$ and $\frac{3}{4}$, or $\frac{70}{100}$ and $\frac{7}{10}$); interpret mixed numbers and position them on a number line (e.g. $3\frac{1}{2}$) *I can find fractions that are equivalent to* $\frac{1}{4}$ *I can order mixed numbers and put them on a number line*	What fraction of these rabbits is grey?  How do you know when a fraction is equivalent to $\frac{1}{2}$? Tell me some fractions that are equivalent to $\frac{1}{4}$. How do you know? Are there any others? What about $\frac{3}{4}$? Draw an arrow on the number line to show $1\frac{3}{4}$.  Write the two missing numbers in this sequence. $\frac{1}{4}$ $\frac{1}{2}$ $\frac{3}{4}$ 1 $\square$ $1\frac{1}{2}$ $1\frac{3}{4}$ $\square$ Tell me a fraction that is bigger than 3.

Objectives *Children's learning outcomes in italic*	**Assessment for learning**
• Find fractions of numbers, quantities or shapes (e.g. $\frac{1}{5}$ of 30 plums, $\frac{3}{8}$ of a 6 by 4 rectangle) *I can find one fifth of a number by dividing it by 5*	What numbers/shapes are easy to find one third, one quarter, one fifth, one tenth of? Why? Tell me how to find one sixth of 42. Would you rather have $\frac{1}{5}$ of 30 sweets or $\frac{3}{4}$ of 12 sweets? Why?
• Identify pairs of fractions that total 1	Can you find a pair of fractions that make less than one whole?
• Identify the main points of each speaker, compare their arguments and how they are presented *I can listen carefully while someone else explains what they have done*	Listen carefully while Sarah tells you about her method of finding two fractions with a total of 1. Now listen while Sam explains his method. Which explanation do you think was the best? Why?

Learning overview

Children continue to **derive and recall multiplication facts and corresponding division facts**. They begin to develop knowledge of multiples of 7. They **count on and back** in different steps, including counting in sevens, using this to help them respond to problem such as:

There are exactly 7 weeks until my birthday. How many days is that?

There are 56 days until my holiday. How many weeks do I have to wait?

They recognise that previously learned facts can help them to remember multiples, for example that a multiple of 7 is the sum of a multiple of 3 and a multiple of 4.

Children continue to apply their **knowledge of place value** to derive answers to calculations such as 70 × 5 and 2000 ÷ 4. They continue to **solve problems**, representing and then interpreting information. For example, they solve this problem:

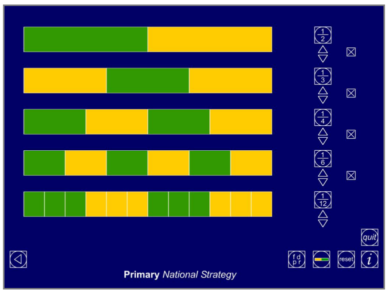
Sean counts his books in fours. He has one left over. He then counts his books in fives. He has three left over. How many books has Sean?

They write a list of multiples of 4, adding 1 to each multiple. They write a list of multiples of 5, adding 3 to each multiple. They look for a number common to both lists then **check that it works in the context of the question**.

Children **count in fractions along a number line** from 0 to 1, for example, in tenths. When they reach 10 tenths they realise that this is equivalent to 1. They extend this by counting beyond 1 from 10 tenths to 20 tenths, realising that 20 tenths is equivalent to 2. They establish that fractions bigger than one whole can be written as **mixed numbers**, for example that 17 tenths can be written as $1\frac{7}{10}$. They draw diagrams to represent a mixed number such as $2\frac{1}{4}$.

Children continue to establish **pairs of numbers that total 1**, recording these as, say, $\frac{3}{10} + \frac{7}{10} = 1$. They use fractions with a sum of 1 to solve problems. When faced with a problem such as: *Max has £48. He spends $\frac{3}{4}$ of it. How much has he got left?* they realise that he would have $\frac{1}{4}$ left. They calculate $\frac{1}{4}$ of 48 to answer the question. Using 8 cubes they make a model that is $\frac{3}{4}$ one colour and $\frac{1}{4}$ another. Keeping the same fractions, they increase the number of cubes, investigating how many cubes they can and can't use. They discover and generalise that they can use multiples of 4.

Children continue to develop their understanding of **equivalent fractions**. Using a fraction wall, number lines or the 'Fractions' ITP, they work in pairs to start from a given fraction and identify other fractions that are equivalent to it.

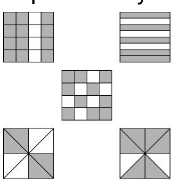


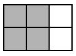
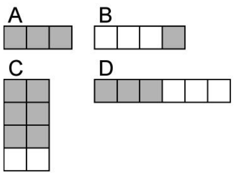
For example, they find different ways of expressing one half. They discuss what makes a fraction equivalent to $\frac{1}{2}$ at first informally in pairs, then giving feedback to a larger group. They vary their talk depending on the audience, using **more precise mathematical language** when presenting to a larger group.

Children continue to develop the **link between fractions and multiplication and division**. They use this to **find fractions of numbers and quantities**. They know that to find $\frac{1}{2}$ they divide by 2, to find $\frac{1}{3}$ they divide by 3, and so on. This helps them find fractions of numbers; for example, when they find $\frac{1}{3}$ of 30, they need to share 30 into 3 equal groups, or work out $30 \div 3 = 10$. Having established that $\frac{1}{3}$ of 30 is 10, they then realise that $\frac{2}{3}$ of 30 is 20. The concept is reinforced by shading squares on a 6 by 5 grid.

Children begin to **link familiar decimals with corresponding fractions**. They recognise the equivalence between the decimal and fraction forms of one half, one quarter and three quarters. They are shown how, on a 0 to 1 number line divided into tenths, the tenths can be marked as fractions ($\frac{1}{10}$, $\frac{2}{10}$, $\frac{3}{10}$, …) or as decimals (0.1, 0.2, 0.3, …). They then explore a 0 to 1 line marked in hundredths. They see that 1 tenth is the same as 10 hundredths, and that 43 hundredths is the same as 4 tenths and 3 hundredths. They relate this to $0.43 = 0.4 + 0.03$.

Unit 4E3 | 3 weeks

Objectives *Children's learning outcomes in italic*	**Assessment for learning**
• Represent a puzzle or problem using number sentences, statements or diagrams; use these to solve the problem; present and interpret the solution in the context of the problem *I can write down number sentences or drawings to help me solve a problem* *When I have solved a problem I re-read the question to make sure that it makes sense*	There are 10 girls and 20 boys in Jill's class. Jill said that there is one girl for every two boys. Her friend Amanda said that means $\frac{1}{2}$ of all the children in the class are girls. Is Jill right? Use words or pictures to explain why. Is Amanda right? Use words or pictures to explain why. A piece of rope 204 cm long is cut into four equal pieces. Which of these gives the length of each piece in centimetres? A 204 ÷ 4 B 204 × 4 C 204 – 4 D 204 + 4 Sita worked out the correct answer to 16 × 5. Her answer was 80. Show how she could have worked out her answer. Harry worked out the correct answer to 70 ÷ 5. His answer was 14. Show how he could have worked out his answer.
• Derive and recall multiplication facts up to 10 × 10, the corresponding division facts and multiples of numbers to 10 up to the tenth multiple *I know all multiplication facts up to 10 × 10, even when they are not in the right order*	How many different multiplication and division facts can you make using what you know about 56? What if you started with 560?
• Develop and use written methods to record, support and explain multiplication and division of two-digit numbers by a one-digit number, including division with remainders (e.g. 15 × 9, 98 ÷ 6) *I can use a written method to multiply a two-digit number by a one-digit number* *I can use a written method to divide a two-digit number by a one-digit number and find the remainder*	Tell me some division questions that have the answer 15. How did you go about working this out? Make up some division questions that have a remainder of 3. How did you do it? Talk me through the method that you used to calculate 56 × 7. Is this division correct? How do you know? How could we put it right? Parveen buys 3 small bags of peanuts. She gives the shopkeeper £2 and gets 80p change. What is the cost in pence of one bag of peanuts? Tell me how you worked out the answer to this problem.
• Use diagrams to identify equivalent fractions (e.g. $\frac{6}{8}$ and $\frac{3}{4}$, or $\frac{70}{100}$ and $\frac{7}{10}$); interpret mixed numbers and position them on a number line (e.g. $3\frac{1}{2}$) *I can use a 2 by 5 rectangle to show you that one fifth is the same as two tenths* *I can place mixed numbers in the correct place on a number line*	Tell me some fractions that are equivalent to $\frac{1}{3}$. How do you know? Are there any others? What about $\frac{2}{3}$? How do you know that two fractions are equivalent? Two of these shapes have three quarters shaded. Point to them. Explain how you know.  Tell me some fractions that are greater than $\frac{1}{2}$. How do you know? What about fractions that are greater than 1? I ate more than $\frac{1}{2}$ a pizza but less than $\frac{3}{4}$. What fraction could I have eaten? What would you prefer: 3 pizzas shared between 4 people or 6 pizzas shared between 10 people? Explain why.

Objectives *Children's learning outcomes in italic*	**Assessment for learning**
• Recognise the equivalence between decimal and fraction forms of one half, quarters, tenths and hundredths *I know that $\frac{1}{2}$ can also be written as 0.5, $\frac{1}{4}$ as 0.25 and $\frac{3}{4}$ as 0.75* *I know that one tenth can be written as $\frac{1}{10}$ or as 0.1 and that one hundredth can be written as $\frac{1}{100}$ or 0.01* *I know that $\frac{25}{100}$ is the same as 0.25. It is also the same as $\frac{1}{4}$*	Which of these decimals means $\frac{7}{10}$? A 70 B 7 C 0.7 D 0.07 Which of these fractions is the same as nought point four? $\frac{1}{4}$ $\frac{1}{40}$ $\frac{1}{400}$ $\frac{4}{10}$ $\frac{4}{100}$
• Find fractions of numbers, quantities or shapes (e.g. $\frac{1}{5}$ of 30 plums, $\frac{3}{8}$ of a 6 by 4 rectangle) *I can find the fraction of an amount, such as $\frac{2}{5}$ of £10*	Which would you rather have: $\frac{1}{3}$ of £30 or $\frac{1}{4}$ of £60? Why? Which would you prefer to receive as pocket money: $\frac{5}{6}$ of £24 or $\frac{3}{7}$ of £49? Why?
• Use the vocabulary of ratio and proportion to describe the relationship between two quantities (e.g. 'There are 2 red beads to every 3 blue beads, or 2 beads in every 5 beads are red'); estimate a proportion (e.g. 'About one quarter of the apples in the box are green') *I can solve simple ratio and proportion problems*	One in every three of these beads is red. What fraction of the beads is red? Create a word problem that uses the words 'in every'. In this diagram, 2 out of every 3 squares are shaded.  Which diagram has 3 out of every 4 squares shaded?  In a book of stamps, there are 2 red stamps to every 5 green stamps. There are 15 green stamps in the book. How many red stamps are there? For every soft drink that Fred collected, Maria collected 3. Fred collected a total of 9 soft drinks. How many did Maria collect? A 3 B 12 C 13 D 27 Create a word problem that uses the words 'to every'.
• Use time, resources and group members efficiently by distributing tasks, checking progress and making back-up plans *I can work in a group to quickly sort a set of mixed numbers* *I can work with a group of other children to discuss and plan how we will solve a problem*	This set of cards has mixed numbers written on them. In your group, put the cards in order.

Learning overview

Using number lines and fraction walls, children begin to recognise the **relative sizes of different fractions**. They sort a set of fractions into those less than and those greater than a half. They notice that for fractions less than a half the numerator is less than half the denominator. They count on and back in halves, quarters, fifths and tenths. They recognise that fractions are numbers and place a set of fractions such as multiples of $\frac{1}{4}$ on a number line. Working in groups they order a set of mixed numbers such as $3\frac{1}{2}$, $4\frac{1}{2}$, $2\frac{3}{4}$ and place them on a number line, deciding among themselves how to **distribute the tasks and resources effectively**.

Children continue to use shapes and other diagrams to explore the **equivalence between sets of fractions** such as fifths and tenths.

Children continue to reinforce the **equivalence of one half, one quarter, three quarters, tenths and hundredths, and their decimal representations**. On a 0 to 2 number line they place tenths represented as fractions and then do the same using decimals. Children explore further the fraction and decimal equivalence of hundredths. Using a blank 100-square they label the squares $\frac{1}{100}$, $\frac{2}{100}$, $\frac{3}{100}$, and so on. They then label the squares using decimal notation to help them to see the equivalence. They recognise that 0.25 is 25 hundredths, and that this is one quarter.

Children find fractions of numbers, shapes and quantities, responding to questions such as:

What fraction of 1 metre is 25 cm?

What is one fifth of £1?

There are 300 children in Bigham School. Four fifths of the children went on a school visit. How many children were left at school?

There are 36 children in the class. In their lunch boxes, half of them have a red apple and one third of them have a green apple. The rest have no apple. How many children have an apple?

Children continue to count forwards and backwards in different steps. They recall or can derive quickly all **multiplication and division facts up to 10 × 10**. They continue to use place value to derive related facts, such as 540 ÷ 9.

They refine their written methods for multiplying and dividing TU by U, including remainders.

38 × 7 = (30 × 7) + (8 × 7) = 210 + 56 = 266

×	7
30	210
8	56
	266

	30 + 8
×	7
	210
	56
	266

$$\begin{array}{r l} 30+8 & \\ \times\ \underline{\ \ 7} & \\ 210 & \quad 30\times 7 = 210 \\ \underline{56} & \quad 8\times 7 = \ \ 56 \\ \underline{\underline{266}} & \end{array}$$

$$\begin{aligned} 96 \div 7 &= (70+26)\div 7 \\ &= (70\div 7)+(26\div 7) \\ &= 10+3 \text{ R } 5 = 13 \text{ R } 5 \end{aligned}$$

$$\begin{array}{r l} 96 & \\ -\underline{70} & \quad (7\times 10) \\ 26 & \\ \underline{21} & \quad (7\times 3) \\ 5 & \end{array}$$

Answer: 13 R 5

Children are introduced to the vocabulary of **ratio and proportion**. They relate fractions to finding a proportion. They describe a proportion using the language of **'in every'**, for example 'I spend 5 days in every week in school', recognising that this means 'I spend 10 days in every 2 weeks at school'. Children meet the vocabulary **'for every' and 'to every'** in everyday statements such as 'I have 1 thumb for every 4 fingers' or 'There are 2 apples to every 1 banana in the bowl'. They recognise that the bowl of fruit has twice as many bananas as apples but that there could be 2 apples and 1 banana, 4 apples and 2 bananas, 6 apples and 3 bananas, and so on. Using two colours, they design a repeating pattern of coloured squares such as blue, blue, red, blue, blue, red, … They notice there are 2 blue squares to/for every 1 red square, 4 blue squares to/for every 2 red squares, and so on. They notice also that 1 in every 3 squares is red and that 2 in every 3 squares are blue. They establish that there are twice as many blue squares as red squares. They use fractions to state these proportions, since $\frac{1}{3}$ of the squares are red and $\frac{2}{3}$ are blue. They go on to consider: *If there are 5 red squares in my repeating pattern, how many blue squares would there be?*

Children **solve problems** such as:

Rosie spent £2 on 10p and 20p stamps. She bought three times as many 10p stamps as 20p stamps. How many of each stamp did she buy?

They represent the problem using patterns of numbers, number sentences or diagrams. They recognise that for every 20p stamp Rosie buys three 10p stamps, and that one group of the stamps would cost 20p + 10p + 10p + 10p = 50p. This helps them to find the solution of four 20p stamps and twelve 10p stamps, which they then check in the context of the problem.