Fractions, Decimals, Percentages and Ratio Policy

"Building confident mathematicians through a consistent and progressive approach to calculation."

Academic Year: 2026-2027

Policy Lead: A. Cassel

Approved By: S. Watkins

Date Approved: 2.6.2026

Review Date: 2.6.2027

Vision Statement

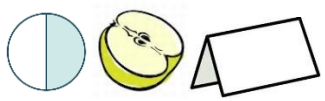
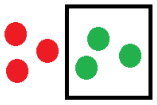
At Hindon Primary School, we believe that all children can develop a secure and meaningful understanding of fractions, decimals and percentages through practical experiences, clear progression and consistent teaching approaches. This policy outlines the progression of knowledge and skills taught from Reception to Year 6, ensuring that children build confidence, fluency and resilience when working with fractions and related concepts.

Through the White Rose Maths scheme, children are supported in moving from concrete resources and visual representations to abstract understanding and efficient methods. We aim for all pupils to develop strong reasoning and problem-solving skills, enabling them to apply their understanding of fractions, decimals and percentages confidently across the wider mathematics curriculum and in real-life contexts.

Contents

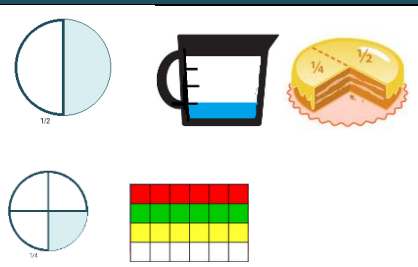
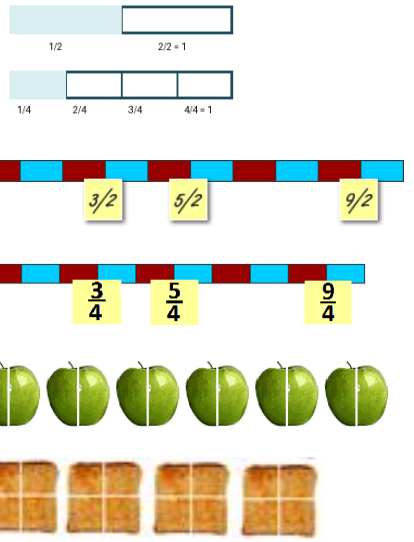
EYFS - Fractions

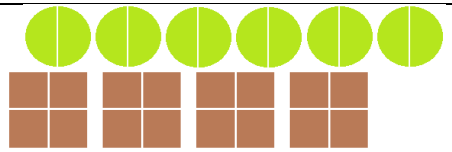
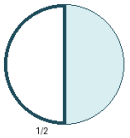
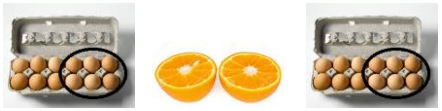
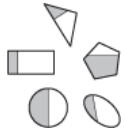
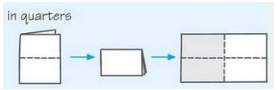
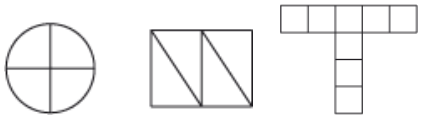
Early fraction understanding begins through play, sharing, folding, comparing and talking about equal parts.

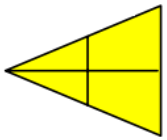
Learning focus	Suggested learning experiences	Key representations	Vocabulary	Reasoning prompts
Understanding halves	Children explore splitting a whole into two equal parts through snack time, cutting, folding, construction and role play. Adults emphasise that halves must be equal.	Half of a shape / object  	whole, half, equal, share, split, same size	What does half mean? How do you know both parts are equal? Can it be half if the parts are different sizes?
Solve problems including halving	Children share small groups of objects into two equal groups, using counters, cubes, toy food and practical contexts.	Two equal groups   	half of, equal groups, share fairly, two parts	How can we make it fair? What is half of this group? What would happen if one was left over?

Year 1 – Fractions

Year 1 children name, find and represent halves and quarters of objects, shapes and quantities. They begin to count in simple fractions and use practical experiences to understand equal parts.

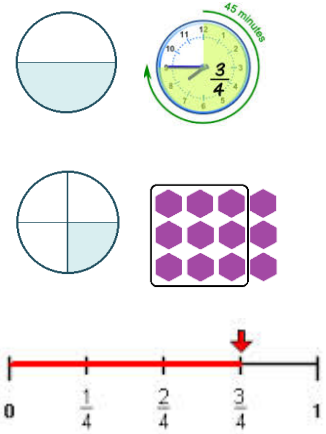
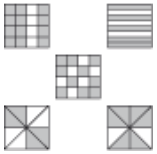
Learning focus	Suggested learning experiences	Key representations	Vocabulary / symbols	Reasoning prompts
Understand unit fractions (½ and ¼)	Children explore halves and quarters through folding, cutting, sharing and practical construction. They split shapes, objects and quantities into two or four equal parts, build towers half or quarter the size of another, create fractional patterns, complete half and quarter turns, and mark halves and quarters on number lines. Adults emphasise that each part must be equal.		one half, halves, one quarter, quarters, equal, two, four, parts Symbols: ½, ¼	How many halves make one whole? How many quarters make one whole? Is this shape split into three parts or into thirds? How do you know? Is she Right? Explain your answer.
Count in fractions (½ and ¼)	Children count in halves and quarters using real objects such as apples, toast or paper strips. They first count with the object name, for example 'one half apple, two half apples', before moving to fractional language only. Counting sticks, fraction strips and simple number lines support counting beyond one whole. Drop in the name of the object when counting, i.e. one half, two halves, three halves. Match counting to a counting stick and placing numbers on it. http://www.topmarks.co.uk/Flash.aspx?f=EggFractions	 Use pictures to represent the things e.g. circles to represent the apples.	fraction, half, halves, quarter, quarters, whole Symbols: ½, ¼	How many halves would I have if I cut three pieces of toast in half? How many oranges do I need to make six half oranges? How do you know?

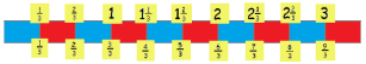
				
Recognise, find and name a half as one of two equal parts of an object, shape or quantity	Children find half of objects, shapes and quantities by folding, cutting, colouring and sharing. Role play such as shops, cafés and tea parties gives meaningful opportunities to find half of a jug, cake, ribbon or set of objects.	  	one half, halves, equal, two, equal parts, divide into 2, split, share, whole Symbols: ½, 1 ÷ 2	How will you find half of that circle? How will you find half of these counters? Which shape is more than half shaded? If there are 20 children and half are girls, how many are boys?  There are twenty children in a classroom. Half of them are girls. How many are boys? Explain how you worked it out. What number is halfway between 6 and 12? How did you work it out? How could we give someone half of 20p if we had one 20p coin? What about half of 12p if we had one 10p and two 1p coins? What is half of this amount?  Complete the shading on this diagram so that one half of the shape is shaded.  How could we work out half of three equal strips of paper?
Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity	Fold paper strips into quarters (move onto adding numbers). Fold paper with paint and make 4 identical images. Cut dough into 4 equal pieces. Share objects out equally into 4 groups.	 	one quarter, quarters, equal, four, equal parts, divide into 4, split, share, whole. Symbols: ¼,1 ÷ 4	Shade one quarter of each shape.  In PE, can you turn through a quarter turn clockwise and anticlockwise? Now make a three quarter turn. How could you find one quarter of a piece of string? What about a quarter of two pieces of string? Here is a set of 12 pencils. How many is a quarter of the set?

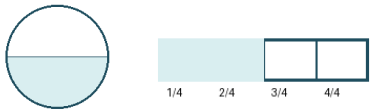
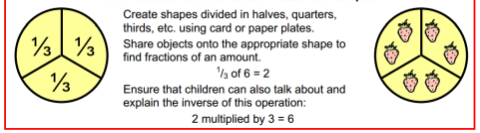
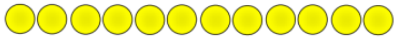
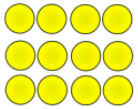
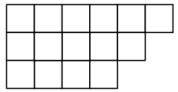
				 How will you find one quarter of that rectangle? If one quarter of a set of shells is 2, how many shells are in the set? Is this shape divided into quarters? Explain how you know.  Complete this statement in different ways: ☐ is $\frac{1}{4}$ of ☐

Year 2 – Fractions

Year 2 children develop their understanding of unit and non-unit fractions, count in fractions and begin to recognise equivalence.

Learning focus	Suggested learning experiences	Key representations	Vocabulary / symbols	Reasoning prompts
Understand unit fractions (½, ⅓, ¼) and non-unit fractions	Children explore fractions through sharing, grouping and practical activities. They identify and describe unit and non-unit fractions of shapes, objects and quantities and mark fractions on simple number lines.		numerator, denominator, equal parts, thirds, quarters Symbols: ½ ⅓ ¼	Can you shade three quarters? How do you know the parts are equal? Complete the shading on this diagram so that ½ is shaded. Describe the shaded part in another way.  Two of these shapes have three quarters shaded. Point to them. Explain how you know.  Explain how to find three quarters of a set of objects/a shape/ on a number line etc.
Count in fractions (¼, ⅓, ½ and ¾) up to 10, starting from any number and using the ½ and 2/4 equivalence on the number line (e.g. 1 ¼, 1 2/4 (or 1 ½), 1 ¾ , 2)	Children count in halves, thirds and quarters beyond one whole using practical resources, fraction strips and counting sticks.	Start with real things, e.g. strips of plasticine.  Cut into fractions, e.g. thirds.	thirds, quarters, equivalent, equal to Symbols: ½ ⅓ ¼	How many halves are there in 3 wholes? What is equivalent to two quarters? How else could I say 7 halves? How do you know? How many halves are there in 3 whole apples and half an apple? Can you show me? What is a half more than three halves? What is 5 and a half subtract two halves? How many halves are there in two and a half? What is equivalent to five halves? What are the missing numbers in the sequence?

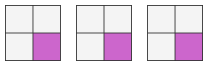
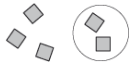
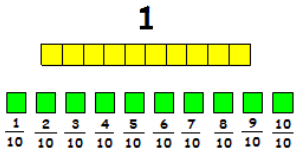
		 Count with name: a third of a strip, two thirds of a strip… Use pictures to represent objects.  Count without object name: one third, two thirds, three thirds, four thirds…  Count placing numbers on the counting stick. Count noticing the equivalence: one third, two thirds, one whole, one and one third, one and two thirds… http://www.topmarks.co.uk/Flash.aspx?f=EggFractions		$\frac{1}{4}$ $\frac{1}{2}$ $\frac{3}{4}$ 1 $\square$ $1\frac{1}{2}$ $1\frac{3}{4}$ $\square$

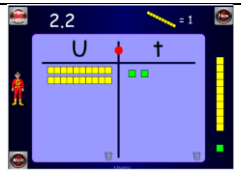
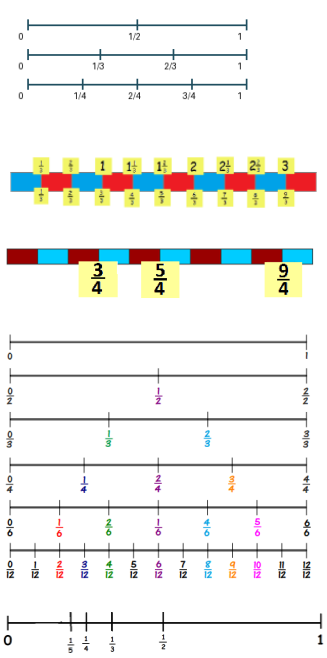
Recognise equivalent fractions	Children compare fractions and recognise simple equivalence including 2/4 and 1/2. Practical apparatus and visual models support comparison.		equivalent, equal, whole, numerator, denominator Symbols: ½ = 2/4	Which fractions are equivalent to one half? How do you know? Tell me some fractions that are equivalent to ½. How do you know? Are there any others? How do you know when a fraction is equivalent to ½? How could you show that ½ is equivalent to $\frac{2}{4}$?
Write simple fractions and find fractions of amounts	Children write simple fractions from practical contexts and find fractions of sets of objects by sharing equally into groups.	**Link fractions of amounts and fractions of shapes** Create shapes divided in halves, quarters, thirds, etc. using card or paper plates. Share objects onto the appropriate shape to find fractions of an amount. $^1/_3$ of 6 = 2 Ensure that children can also talk about and explain the inverse of this operation: 2 multiplied by 3 = 6 	half, quarter, thirds, divide, share equally Symbols: ½ ⅓ ¼	What is one third of 12? How did you work it out?
Recognise, find, name and write fractions of shapes, lengths and quantities	Children identify fractions in shapes, measures and quantities. They solve problems involving fractions of amounts and explain their reasoning.	 Use models and images alongside oral work. For example, display 12 small objects such as counters.  Ask questions such as: 'What is one third of these 12 counters?' 'What is two thirds of 12 counters?' 'What is three thirds of 12?' Arrange the counters in ways that help children to see the process and gradually reduce the reference to the counters as the children become more confident. Record the steps with the children and encourage them to recognise the underlying counting in 4s.  $^1/_3$ of 12 is 4 $^2/_3$ of 12 is 8 $^3/_3$ of 12 is 12	fraction, numerator, denominator, equal groups Symbols: ½ ⅓ ¼	How many squares are shaded? What fraction is shaded? Shade 1/3 of this shape. How many squares is it made from? What is 1/3 of 15? How do you know? How many squares do you need to shade?  Explain how we could find one quarter of this set of 12 pencils? What about three quarters? Shade more squares so that exactly half of the shape is shaded.  Take 20 counters. Can you show me one quarter? Two quarters? Three quarters? Four quarters? What do you notice? Can you write that down in some way?

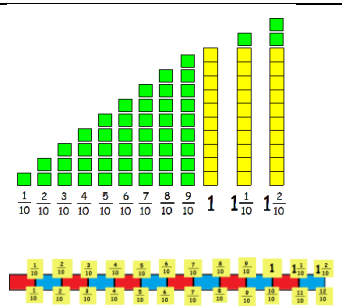
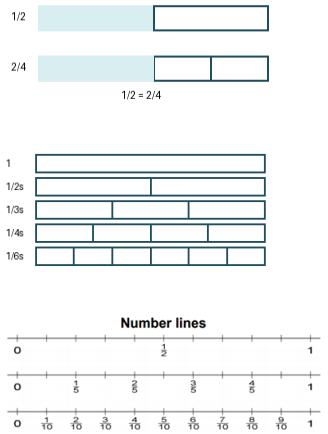
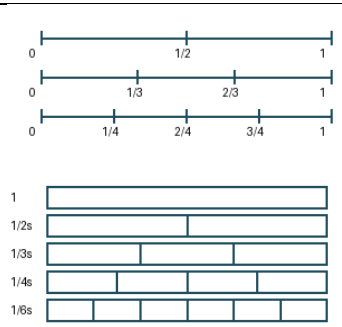
				Here is a set of 12 pencils. How many is three quarters of the set?  Find three quarters of 20 biscuits. Three quarters of 24 buttons. How will you find one quarter of that rectangle? Three quarters? Here is a pizza cut into eight equal pieces. How many pieces are needed for three quarters of the pizza? Take 20 cubes. Make a shape which is $^1/_2$ red and $^1/_4$ blue. What fraction of the shape is not red or blue? How can you find $^1/_3$ of 27?

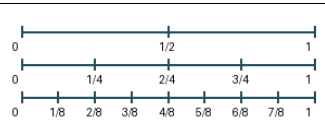
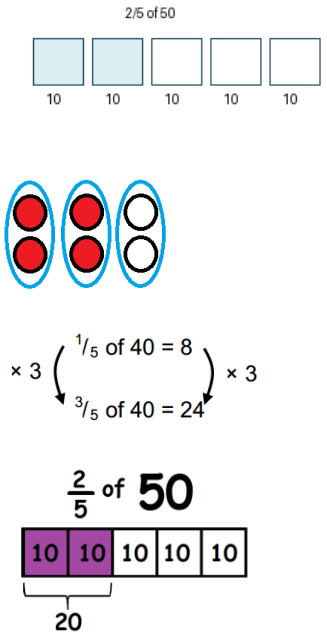
Year 3 – Fractions: Understanding, Counting and Equivalence

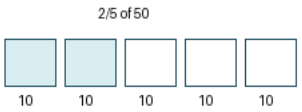
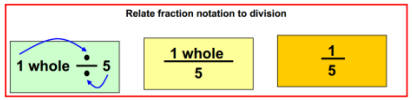
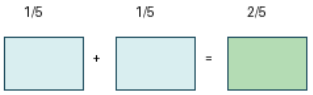
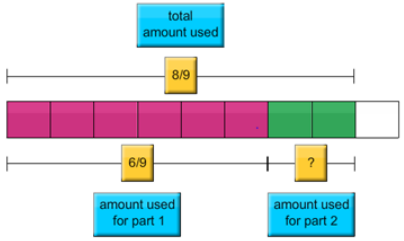
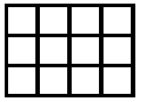
Year 3 children build a deeper understanding of fractions as parts of a whole, as quantities and as numbers. They count in tenths, represent fractions on number lines and begin to explore equivalent fractions. Year 3 children compare, order and calculate with fractions while solving increasingly complex fraction problems.

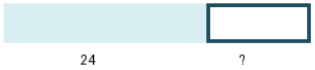
Learning focus / objective	Suggested learning experiences	Key representations	Vocabulary / symbols	Reasoning prompts
Recognise fractions in the context of parts of a whole, numbers, measurements, a shape, and unit fractions as a division of a quantity.	Children cut, fold, share and shade items to represent fractions. They explore how the numerator shows the number of equal parts selected and the denominator shows the total number of equal parts in the whole. They also represent fractions in practical contexts including shape, measure, number lines and quantities.	  3 shared by 4 = ¾ 	numerator, denominator, one half, halves, one quarter, three quarters, third, fifths, tenths, equal parts, whole Symbols: ½, ⅓, ¼, ⅕	What fraction of this shape is shaded? Could the same fraction be shaded another way? What fraction of these objects is circled? What fraction of this shape is shaded? Could the same fraction be shaded in another way? How many?  What fraction of these tiles is circled?  Tell me some fractions that are greater than ½. How do you know?
Recognise that tenths are dividing an object into 10 equal parts or dividing one-digit numbers or quantities by 10 (connect to place value, decimal measures and to division by 10).	Children divide strips, metre lengths, shapes and quantities into ten equal parts. They connect tenths to place value, decimal measures and division by 10 using practical resources such as metre sticks, Dienes and place value models.	  http://www.topmarks.co.uk/Flash.aspx?f=diennesandcoinsv3	place value, partition, digit, ones, units, tens, hundreds, one-digit number, two-digit number, three-digit number, tenths Symbols: 1 ÷ 10, 1/10, 0.1	What fraction is each piece? How many tenths make one whole? What is one tenth more or less than this number? How could you show one tenth?

				
Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators.	Children use counting in fractions to place unit and non-unit fractions on a number line. They compare the position and value of fractions and connect this to fractions of ten where appropriate.		place value, partition, digit, ones, units, tens, hundreds, one-digit number, two-digit number, three-digit number, tenths Symbols: $\frac{1}{2}$ $\frac{1}{5}$ $\frac{2}{5}$ $\frac{3}{5}$ $\frac{4}{5}$ $\frac{5}{5}$ $\frac{1}{10}$ $\frac{2}{10}$ $\frac{3}{10}$ $\frac{4}{10}$ $\frac{5}{10}$ $\frac{6}{10}$ $\frac{7}{10}$ $\frac{8}{10}$ $\frac{9}{10}$ $\frac{10}{10}$	Draw an arrow on the number line to show 1/2. I ate more than 1/2 a pizza but less than 3/4. What fraction could I have eaten?
Count up and down in tenths.	Children count forwards and backwards in tenths from zero, from whole numbers and from mixed numbers such as 2 and a half or 2 and 6 tenths. They use strips, Dienes, money and number lines to support counting.		tenths, numerator, denominator Symbols: 1/10	Why does the numerator change? If we count in tenths, will the denominator change? What does it mean when the numerator is greater than the denominator?

				
Recognise and show, using diagrams, equivalent fractions with small denominators.	Children use fraction cards, strips, Cuisenaire rods and fraction walls to build equivalent fractions. They compare the size of fractions and explain when two fractions have the same value.		equivalent, fraction, balance, equal, whole, numerator, denominator Symbols: 1 =, 1/2 = 2/4	Tell me some fractions that are equivalent to 1/4. How do you know? What about 3/4? How could you show that 2/4 is equivalent to 1/2? How could you show that $\frac{3}{6}$ is equivalent to ½? What do you know about $\frac{3}{3}$ and $\frac{6}{6}$?
Understand unit and non-unit fractions as numbers on the number line, and deduce relations between them, such as size and equivalence.	Children use number lines, fraction cards, Cuisenaire rods and folded strips to compare fractions and explore equivalence. They fold strips into halves, quarters and eighths to discuss how many equal parts make one whole.		place value, partition, digit, ones, units, tens, hundreds, tenths, equivalent, fraction, balance, equal, whole, numerator, denominator Symbols: ½, ¼, ¾, <, >, =	Draw an arrow on the number line to show 3/4. Write a fraction that is larger than 1/2. What would you divide by if you needed to find 1/2 or 1/4?

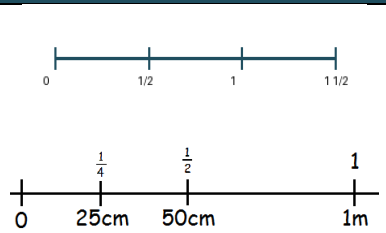
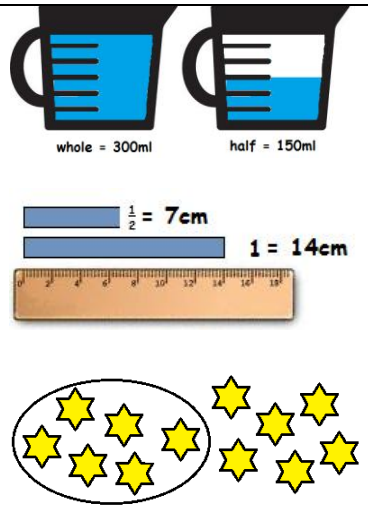
Compare and order unit fractions, and fractions with the same denominators.	Children compare and order fractions using number lines, fraction strips and visual models. They discuss which fractions are greater or smaller and justify their reasoning using mathematical vocabulary.		vinculum, numerator, denominator, division, equivalent, equal part Symbols: < > = $\frac{1}{2}$ $\frac{1}{3}$ $\frac{2}{3}$ $\frac{1}{4}$ $\frac{3}{4}$ $\frac{1}{5}$ $\frac{2}{5}$ $\frac{3}{5}$ $\frac{4}{5}$ $\frac{1}{10}$ $\frac{3}{10}$ $\frac{7}{10}$ $\frac{9}{10}$	Which is smaller: one quarter or one eighth? Can you order these fractions from smallest to largest?
Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.	Children find fractions of sets of objects by grouping and sharing equally. They use multiplication and division facts to support finding fractions of amounts.		fraction, equal parts, numerator, denominator, multiply, divide Symbols: x ÷ $\frac{1}{2}$ $\frac{1}{3}$ $\frac{2}{3}$ $\frac{1}{4}$ $\frac{3}{4}$ $\frac{1}{5}$ $\frac{2}{5}$ $\frac{3}{5}$ $\frac{4}{5}$ $\frac{1}{10}$ $\frac{3}{10}$ $\frac{7}{10}$ $\frac{9}{10}$	Would you rather have 1/5 of 30 sweets or 3/4 of 12 sweets? Explain your reasoning. One third of a number is 7. What is the number? What is $\frac{1}{3}$ of 9, 12, 15…? How did you work it out?

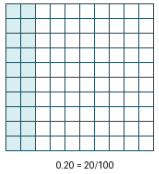
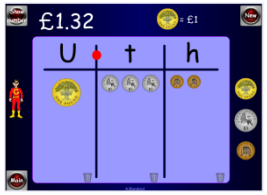
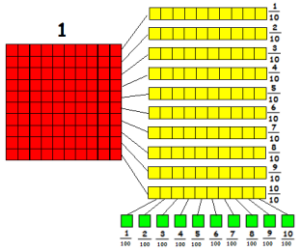
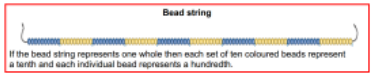
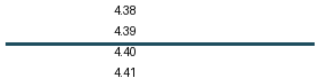
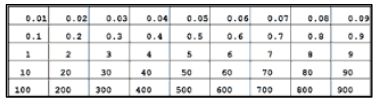
Understand the relation between unit fractions as operators (fractions of), and division by integers.	Children use practical equipment and pictorial models to connect fractions of amounts to division. They explore how finding a fraction is linked to sharing equally.	  A number line can then be used as a jotting/image to help solve fraction as operator problems. E.g. when finding 1/3 of £60, drawing a line, then marking 0 and £60 at either end might help the children to connect finding a fraction (a third) to dividing (÷3).	operator, equal groups, division, whole, equal parts Symbols: x ÷ $\frac{1}{2}$ $\frac{1}{3}$ $\frac{2}{3}$ $\frac{1}{4}$ $\frac{3}{4}$ $\frac{1}{5}$ $\frac{2}{5}$ $\frac{3}{5}$ $\frac{4}{5}$ $\frac{1}{10}$ $\frac{3}{10}$ $\frac{7}{10}$ $\frac{9}{10}$	What operation would you use to find one seventh of 35? Why? Tell me how to find one sixth of 42. What operation must you do to find one seventh of a number? $\frac{1}{3}$ of 75 is 25. Write this as a division statement. What operation would you key into a calculator to find $\frac{1}{8}$ of 256?
Add and subtract fractions with the same denominator within one whole.	Children use visual models and practical resources to add and subtract fractions with the same denominator. They explore how the denominator remains constant while the numerator changes.	 Clay is making an art project. He used 6/9 meter of elastic for the first part. When he finished, Clay had used 8/9 meter of elastic. How much elastic had Clay used in the second part of the project? 	numerator, denominator, whole, equal parts Symbols: + - $\frac{1}{2}$ $\frac{1}{3}$ $\frac{2}{3}$ $\frac{1}{4}$ $\frac{3}{4}$ $\frac{1}{5}$ $\frac{2}{5}$ $\frac{3}{5}$ $\frac{4}{5}$ $\frac{1}{10}$ $\frac{3}{10}$ $\frac{7}{10}$ $\frac{9}{10}$	Use this 3 by 4 rectangle to find two fractions that add up to 1.  Here is a chocolate bar.  Bill eats 3 pieces and Ann eats 2 pieces. What fraction of the chocolate bar remains?

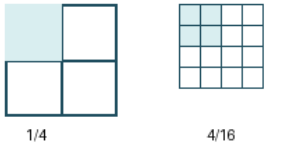
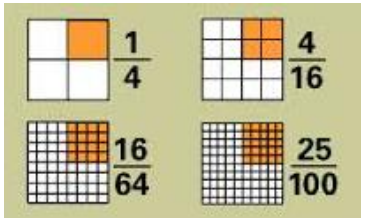
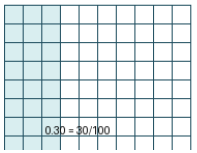
Solve problems that involve all of the above.	Children apply their understanding of fractions to solve increasingly complex problems involving comparison, fractions of quantities and calculations. Bar models and visual representations support reasoning.		fraction, part, equal parts, whole, numerator, denominator, equivalent **Symbols: + - x ÷ <>** $\frac{1}{2}$ $\frac{1}{3}$ $\frac{2}{3}$ $\frac{1}{4}$ $\frac{3}{4}$ $\frac{1}{5}$ $\frac{2}{5}$ $\frac{3}{5}$ $\frac{4}{5}$ $\frac{1}{10}$ $\frac{3}{10}$ $\frac{7}{10}$ $\frac{9}{10}$	If 24 flowers represent two thirds of the flowers, how many flowers are there altogether? A half of an object is bigger than a quarter of an object. Always/Sometime/ Never? Fold a piece of paper in half. Now fold another piece in half in a different way. Are there any other ways? What is the same? What is different? Halving a number less than 20 gives an answer of less than ten. Always/Sometime/ Never?

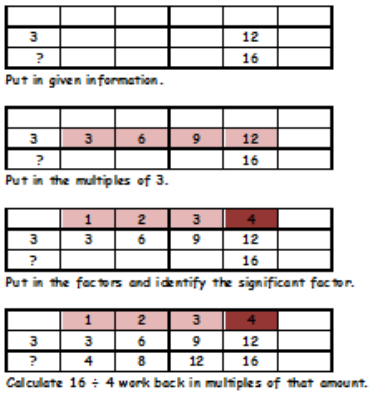
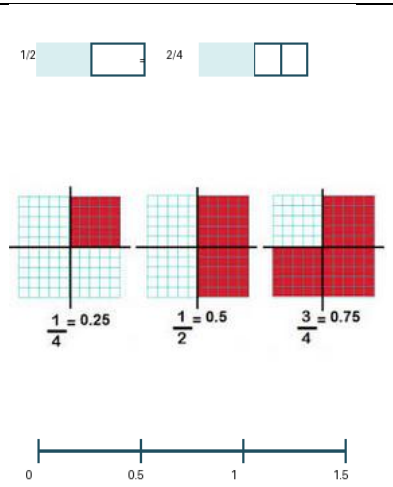
Year 4 – Fractions

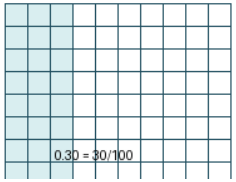
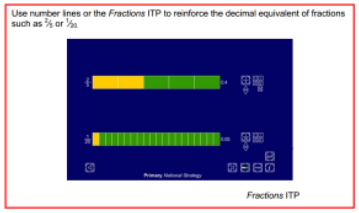
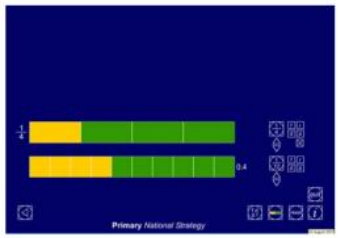
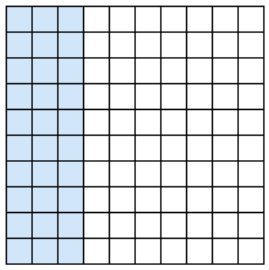
Year 4 children deepen their understanding of fractions as numbers and develop connections between fractions, decimals and measures. They recognise equivalence, connect fractions and decimals and explore hundredths in greater depth. In Year 4, children compare order and round decimals while strengthening their understanding of place value. They continue to calculate with fractions and decimals and apply their understanding to increasingly complex reasoning and problem-solving contexts.

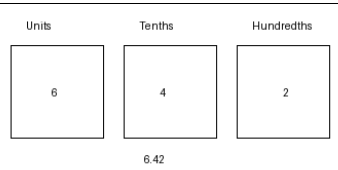
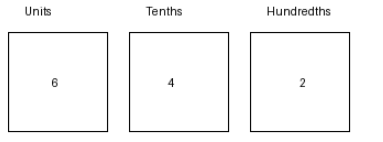
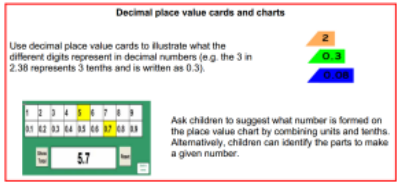
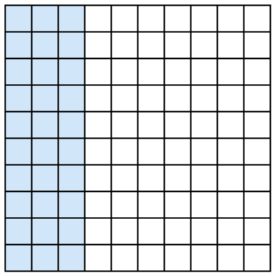
Learning focus / objective	Suggested learning experiences	Key representations	Vocabulary / symbols	Reasoning prompts
Use the number line to connect fractions, numbers and measures.	Children use measuring equipment and number lines to connect fractions with measures including length, mass and volume. They place fractions and mixed numbers on number lines and explore intervals.		mixed numbers, one litre, hundred centimetres, one litre, 1000 millilitres, half, quarter, three quarters, tenth, fifth Symbols: ½ ⅓ ¼ ⅕ ⅙ ⅛	What would half of the jug be? Show me a number line. Can you mark the divisions on this number line in tenths? If this jug holds 500ml, what would half of the jug be? Show me on a number line. Can you mark the divisions on this number line in tenths of the whole amount?
Make connections between fractions of a length, of a shape and of a representation of one whole or set of quantities.	Children compare fractions represented in different ways, including shapes, lengths and sets of objects. Practical resources and diagrams help children recognise equivalent representations.		measurements, one metre, one hundred centimetres, one litre, 1000 millilitres, half, quarter, three quarters, tenth, third Symbols: m, cm, km, l, ml, kg, g, half, quarter, fifth, tenth, third, $\frac{1}{2}$ $\frac{1}{3}$ $\frac{2}{3}$ $\frac{1}{4}$ $\frac{3}{4}$ $\frac{1}{5}$ $\frac{2}{5}$ $\frac{3}{5}$ $\frac{4}{5}$ $\frac{1}{10}$ $\frac{3}{10}$ $\frac{7}{10}$ $\frac{9}{10}$	What fraction of this shape is shaded? Can you show this fraction another way? What fraction of this shape is shaded? Can you say this fraction in another way?  I circled a quarter of the shapes. How many were in the original set? 

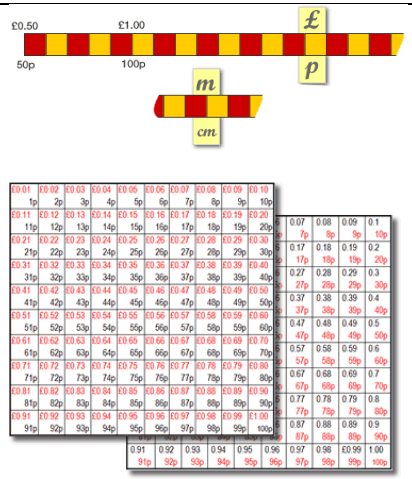
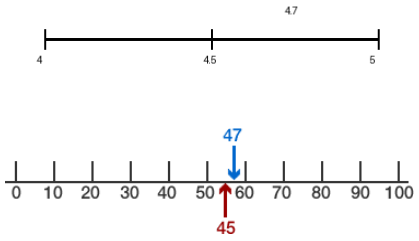
Recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.	Children divide shapes, place value models and quantities into hundredths. They explore the relationship between tenths and hundredths using practical and pictorial representations.	 http://www.topmarks.co.uk/Flash.aspx?f=diennesandcoinsv3   	place value, partition, digit, ones, units, tens, hundreds, one-digit number, two-digit number, three-digit number, tenths, hundredths Symbols: **1 ÷ 10, 1 ÷ 100,** $\frac{1}{10}$ $\frac{1}{100}$	What fraction is each piece? How many hundredths make one whole? Which decimal means 7/10 or 7/100? What fraction is each piece? How many hundredths make one whole? What is one hundredth less/more than …? How could you show a hundredth? Which of these decimals means $^{7}/_{10}$? A 70 B 7 C 0.7 D 0.07
Count up and down in hundredths.	Revisit counting in tenths and make clear links between counting in tenths and counting in decimals (0.1, 0.2, 0.3…) before introducing hundredths. Begin with practical resources, such as Dienes equipment and money, to support understanding. For example: 1 flat = 1 whole 1 rod = 1 tenth 1 unit = 1 hundredth Or when using money: £1 = 1 whole 10p = 1 tenth 1p = 1 hundredth Provide opportunities for children to count in hundredths from zero, from any whole number, from any hundredth value	     	units, tenths, hundredths, numerator, denominator, equivalence Symbols: $\frac{1}{10}$ = 0.1 $\frac{1}{100}$ = 0.01	Which is greatest: one tenth or one hundredth? What is the next hundredth after 3.57? What is the hundredth before 3.57?

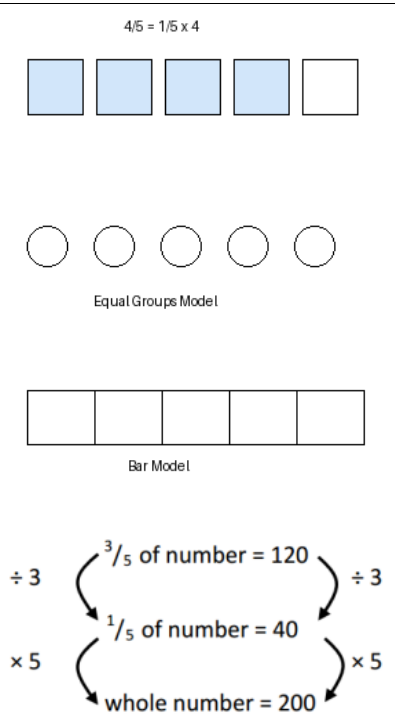
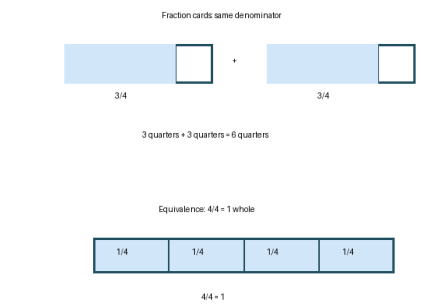
	and from mixed decimal amounts (for example, 2 and a half, or 2 and 51 hundredths). Encourage fluency by using a calculator as a counting tool through the constant function, for example: 4.38 + 0.01 = 4.39, 4.40, 4.41…			
Recognise and show, using diagrams, families of common equivalent fractions.	Children explore equivalent fractions through diagrams, fraction walls and grids. They compare fractions and identify when different fractions have the same value. Explore fraction walls to identify equivalent fractions and compare the relative size of fractions. Provide opportunities for children to investigate different fractions of the same whole, such as a square, rectangle or strip of paper. Using squared paper where appropriate, encourage children to compare pieces and identify fractions that are equal in size. Children should also explore fractions of the same quantity and compare the results, recognising when different fractions produce the same answer.	  	equivalent fraction, equal, whole, numerator, denominator Symbols: ½ = 2/4 = 4/8 $\frac{1}{2}\ \frac{1}{3}\ \frac{2}{3}\ \frac{1}{4}\ \frac{3}{4}\ \frac{1}{5}\ \frac{2}{5}\ \frac{3}{5}\ \frac{4}{5}\ \frac{1}{10}\ \frac{3}{10}\ \frac{7}{10}\ \frac{9}{10}$	Which fractions are equivalent? How do you know? Can you show the same fraction in a different way?
Recognise and write decimal equivalents of any number of tenths or hundredths.	Children connect fractions and decimals using place value grids, number lines and practical representations. They recognise decimal equivalents of tenths and hundredths.	 	place value, decimal, tenths, hundredths, denominator Symbols: 1 ÷ 10, 1 ÷ 100, 0.1, 0.01 $\frac{1}{2}\ \frac{1}{3}\ \frac{2}{3}\ \frac{1}{4}\ \frac{3}{4}\ \frac{1}{5}\ \frac{2}{5}\ \frac{3}{5}\ \frac{4}{5}\ \frac{1}{10}\ \frac{3}{10}\ \frac{7}{10}\ \frac{9}{10}$	Which decimal is equivalent to three tenths? Which is greater: 0.3 or 0.03? What is the missing number? $\frac{7}{10} = \frac{\square}{30}$ How do you know? Tell me a fraction that is equivalent to $\frac{2}{3}$ but has a denominator of 9. How did you do it? Find the missing number

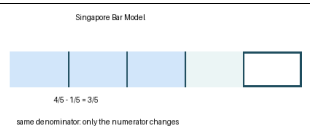
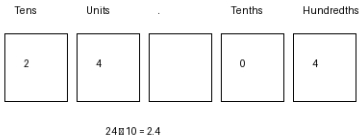
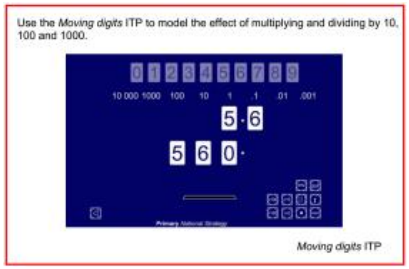
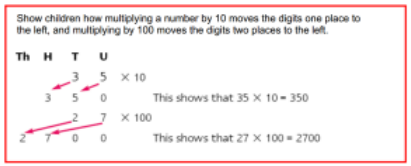
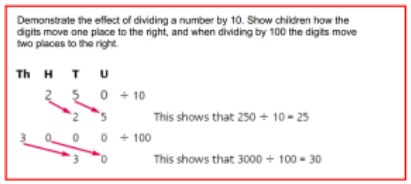
		$\frac{3}{\square} = \frac{12}{16}$  		$\frac{3}{\square} = \frac{12}{16}$ Karen makes a fraction using two number cards. She says, 'My fraction is equivalent to $\frac{1}{2}$. One of the number cards is 6' What could Karen's fraction be? Give both possible answers. What clues did you look for to cancel these fractions to their simplest form? How do you know when you have the simplest form of a fraction?
Recognise and write decimal equivalents to ¼, ½, ¾.	Children use practical resources and visual models to connect common fractions to decimal equivalents. They compare and order decimal equivalents. Link children's understanding to counting in fractions by using simple number lines divided into intervals of 0.5. Encourage children to count forwards and backwards in steps of 0.5 before progressing to other step sizes, such as 0.2 and 0.25. Use 10 × 10 grids to reinforce the concept that each small square represents one hundredth (0.01). Explore fractions of the whole grid and use these representations to identify and record decimal equivalents. Provide opportunities for children to use a calculator to explore the relationship between fractions and division. For example, children can calculate decimal equivalents by dividing the numerator by the denominator, such as ¾ = 3 ÷ 4.	 	decimal equivalent, fraction, denominator, numerator Symbols: ÷ = ½ 0.5	What is the decimal equivalent of one quarter? How do you know?

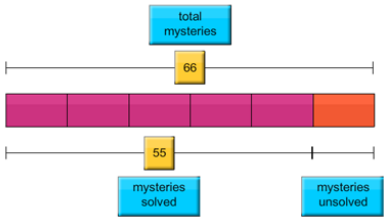
Recognise and write decimal equivalents of any number of tenths or hundredths and connect these to measures and money.	Children apply their understanding of decimal fractions to measures and money contexts. Practical problems support fluency and reasoning. Establish that the decimal point is used to separate whole amounts and parts of the whole. Use a calculator and the language of fractions to find decimal and fraction equivalents. Present children with commonly confused fraction and decimal equivalents, for example, 0.4 and ¼.	   *Fractions* ITP	tenths, hundredths, decimal place, money, measure Symbols: £1.32, 0.25	How many pence are the same as 0.25? Which is greater: 4/10 or 37/100? Explain your reasoning. Ask children to identify fractions and decimals that are equivalent. For example: Tell me two fractions that are equivalent to 0.5. Are there any other possibilities? Which of these fractions is equivalent to 0.5? Which of these is equivalent to 0.4? Which fraction is equivalent to naught point four? Encourage children to make links between fractions, decimals, money and measures through reasoning questions such as: -How many pence are equal to £0.25? -How many hundredths are equivalent to 0.25? -How else could you write twenty-five hundredths? -How many centimetres are equivalent to 0.75m? -How many hundredths are equivalent to 0.75? -How else could you write seventy-five hundredths? Provide opportunities for children to interpret diagrams, shaded models and representations by asking questions such as: -How would you write this fraction as a decimal? -Which number represents the shaded part of the figure? -Explain how you know your answer is correct.
Compare numbers with the same number of decimal places up to 2 decimal places.	Make and compare decimals using place value counters, decimal grids, money and measurement contexts. Order decimals on number lines, identify the value of each digit and explain which digit determines the greater value. Encourage children to justify comparisons using place value knowledge.	 30/100 = 0.30	decimal, equal parts, decimal point, equivalent, place value, units, tenths, hundredths Symbols: 0.1, 0.01, <, >, =	Which is larger: £0.75 or £0.90? Why? Which is larger: 2.39 or 2.93? Explain your thinking.

				
Understand the place value of decimals.	Use arrow cards, place value charts, counters and measuring equipment to explore tenths and hundredths. Link decimals to money and measures and investigate how the value of a digit changes depending on its position.	  	place value, units, decimal point, tenths, hundredths Symbols: 6.42, 0.7, 0.07	0.7 represents 7 tenths. What does 0.07 represent? Which is larger: 239 cm or 2.39 m? Why?
Represent numbers with 1 or 2 decimal places in different ways, including measures.	Represent decimals using money, measures, number lines, decimal grids and practical equipment. Connect fractions, decimals and measures and move fluently between representations.	  	place value, units, decimal point, tenths, hundredths Symbols: 7.2, £7.20, 7 and 2 tenths	Write down a number between 7 and 8. Show it as a decimal, a measure and using a representation. A CD costs between £5.50 and £5.65. How much could it cost?

				
Round decimals with one decimal place to the nearest whole number.	Use number lines, practical measures and money contexts to identify the nearest whole number. Discuss midpoints and explain why numbers round up or down.		place value, tenths, nearest, round Symbols: 4.7 → 5, 4.2 → 4	What is 4.7 rounded to the nearest whole number? I rounded my number to 3. What could my number be? What is the biggest/smallest number I would round to 2? Simon rounded 1.6 to 2. Was he right? Explain how you know. Show me why I would round 2.3 to 2. My chair is nearly 1 m high. How tall could it be?

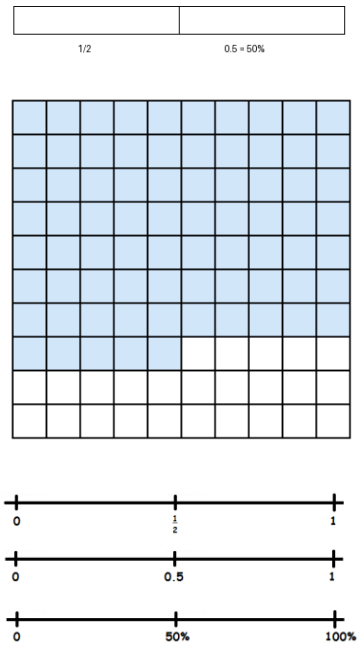
Recognise, find and write fractions of a discrete set of objects.	Provide children with a range of practical and pictorial representations to develop their understanding of fractions as operators. Model how non-unit fractions can be found by first calculating the corresponding unit fraction before scaling up to find the required fraction.		Vocabulary: numerator, denominator, multiply, divide, whole, fraction Symbols: × ÷ = ½ ¼ ¾	There are 24 coloured cubes in a box. Three quarters are red, four are blue and the rest are green. How many green cubes are there? One more blue cube is added. What fraction is blue now? Three quarters of a number is 48. What is the number? Tim has eaten 2/3 of the grapes. He ate 64 grapes. How many grapes were there to start with?
Add and subtract fractions with the same denominator.	Use fraction cards and visual models to support children in adding and subtracting fractions with the same denominator. Children should handle and compare fraction pieces so they can see that the size of each part remains the same and only the number of parts changes. Include equivalence where this supports understanding, for example recognising that 4/4 is equal to 1 whole. Encourage children to use concrete resources before moving to pictorial models and abstract calculations. Model calculations using bar models and fraction strips, making explicit that when the denominator is the same, the denominator remains unchanged. Children should explain additions and subtractions using language such as 'three		Vocabulary: fraction, part, equal parts, one whole, parts of a whole, number of parts, divide, one half, one third, one quarter, one fifth, one sixth, one tenth, unit fraction, numerator, denominator, add, subtract. Symbols: + - = $\frac{1}{2}$ $\frac{1}{3}$ $\frac{2}{3}$ $\frac{1}{4}$ $\frac{3}{4}$ $\frac{1}{5}$ $\frac{2}{5}$ $\frac{3}{5}$ $\frac{4}{5}$ $\frac{1}{10}$ $\frac{3}{10}$ $\frac{7}{10}$ $\frac{9}{10}$	What is ¾ + ¾? What is ⅘ - ⅕? What is ¼ less than 1? How do you know? Show me how you worked it out.

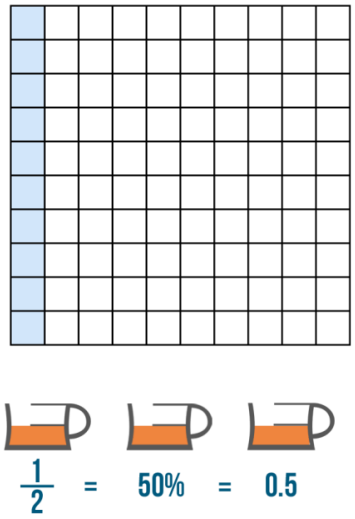
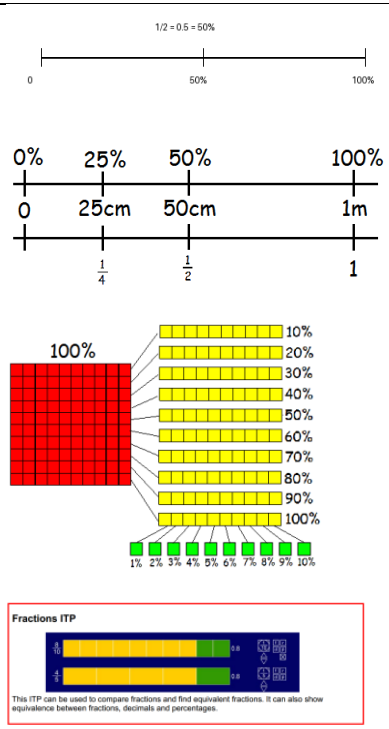
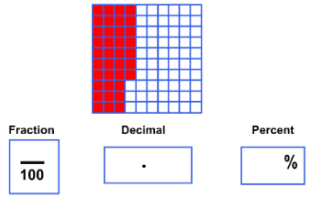
	quarters plus three quarters is six quarters' or 'four fifths subtract one fifth is three fifths'.			
Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths.	Use place value grids showing tens, units, decimal points, tenths and hundredths. Children should build numbers using digit cards and investigate the effect of dividing by 10 and 100. Encourage discussion about the visual pattern created when digits change value during division. Link learning to converting units of measure and estimation so pupils can identify unreasonable answers. For example, discuss why 1.5 m cannot equal 15 cm and use known benchmarks to justify answers. Explore the origins of measurement vocabulary such as centi and milli and where these roots appear elsewhere.	400 ÷ 100 = 4 40 ÷ 10 = 4 4 ÷ 1 = 4 0.4 ÷ 0.1 = 4 400 ÷ 10 = 40 40 ÷ 10 = 4 4 ÷ 10 = 0.4 0.4 ÷ 10 = 0.04    	Vocabulary: digit, decimal, multiply, times, divide, share, scale up, scale down, increase, decrease, factor, tens of thousands, thousands, hundreds, tens, units, ones, tenths, hundredths, thousandths. Explore the roots of centi and milli (e.g. century, centurion). Symbols: ÷	What is ___ ÷ 10? What is ___ ÷ 100? How do you know? Can you show me how to divide by ten? What mistake have I made here?

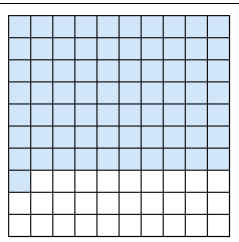
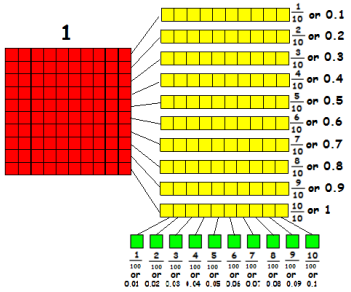
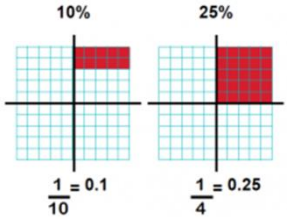
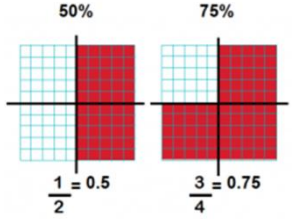
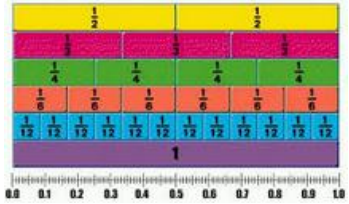
Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions with a whole number answer.	Use RUCSAC, or a similar structured problem-solving approach, to support pupils in reading, understanding, modelling, calculating, solving, answering and checking. Encourage children to select the most appropriate representation from those previously taught, including bar models, fraction models and Singapore Bar Models. Provide opportunities to investigate mathematical statements and justify whether they are Always, Sometimes or Never true.	 Bar Model The Snoop and Spy Detective Agency was hired to solve 66 mysteries last year. The detectives were able to solve 5/6 of the mysteries. How many mysteries did the detective agency solve?  http://www.mathplayground.com/thinkingblocks.html	Vocabulary: All previously taught fraction vocabulary. Symbols: All previously taught fraction symbols.	Use a range of reasoning and problem-solving questions, including Always, Sometimes, Never statements and multi-step fraction problems.

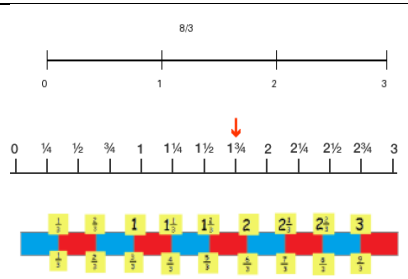
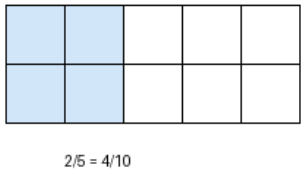
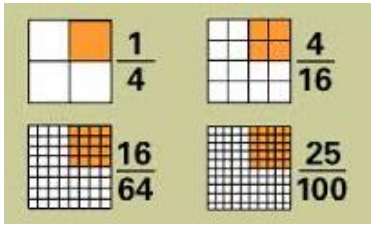
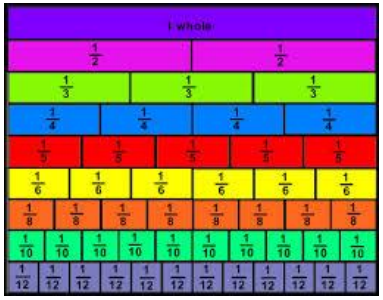
Year 5 – Fractions, Decimals and Percentages

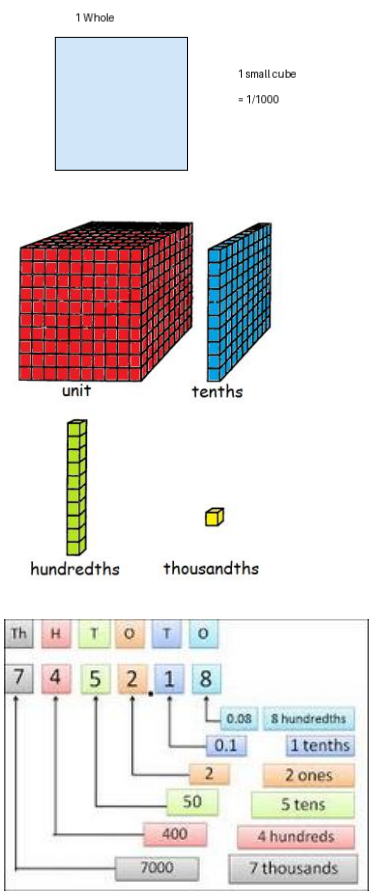
In Year 5, pupils build upon their previous understanding of fractions and decimals by developing a deeper knowledge of equivalence, calculation and problem solving. They learn to make connections between fractions, decimals and percentages, recognise and use thousandths, compare and order fractions and decimals, and apply their understanding to a range of real-life contexts. Through the use of practical resources, visual representations and mathematical reasoning, pupils are encouraged to explain their thinking, justify their methods and develop confidence in solving increasingly complex problems involving fractions, decimals and percentages.

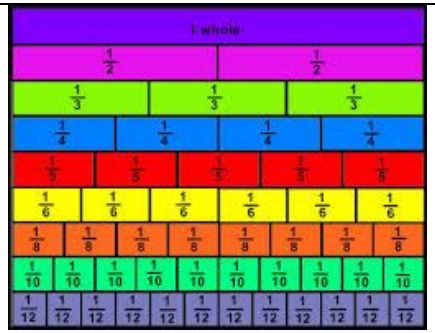
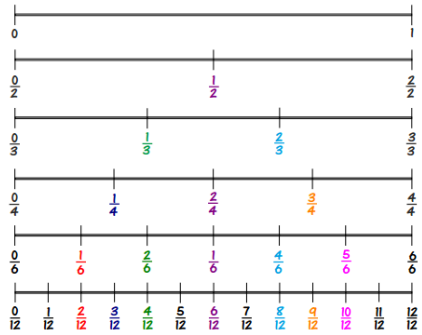
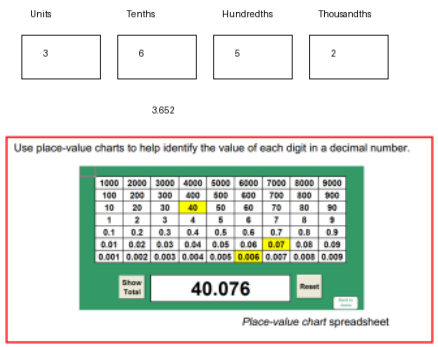
Learning focus / objective	Suggested learning experiences	Key representations	Vocabulary / symbols	Reasoning prompts
Understand that percentages, decimals and fractions are different ways of expressing proportions	Provide opportunities for pupils to explore how fractions, decimals and percentages can represent the same proportion of a whole. Encourage children to investigate fractions of 100 and make direct links to percentages. Use simple division calculations, such as 1 ÷ 2, to demonstrate how fractions can be converted into decimal and percentage forms. Fold strips of paper to create equal sections and use them as number lines to support understanding of equivalence. Regularly encourage pupils to move between representations and justify why different forms represent the same value.		Vocabulary: equivalence, fractions, percentages, decimals, division Symbols: ¾ = 3 ÷ 4	Fill in the missing numbers in the grid. Fraction / Decimal / Percentage ½ / / / 0.2 / / / 75% ⅗ / / / 0.25 / Explain how you know the values are equivalent. Can you represent the same proportion as a fraction, decimal and percentage?

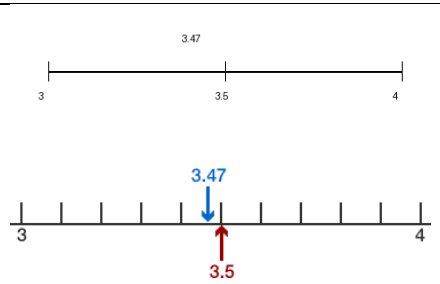
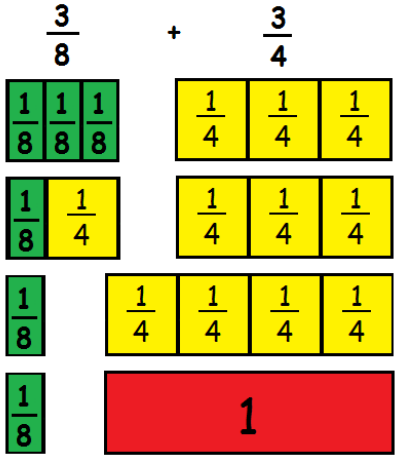
Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal	Use practical resources and real-life contexts to develop understanding of percentages as parts per hundred. Provide opportunities for pupils to explore money and recognise that percentages, fractions and decimals can represent the same proportion. For example, use coins to demonstrate that 10p is one tenth of £1 and can also be represented as 10% or 10/100. Encourage children to make connections between percentages, fractions and decimals by using hundred squares, money models and equivalence diagrams.		Vocabulary: percentage, per cent, tenths, hundredths, equivalent Symbols: %, 0.1, 0.01	How can you model a percentage? How can it be written as a fraction with a denominator of 100? What would the equivalent decimal be?
Understand and use the equivalence between percentages, fractions and decimals (e.g. 100% is a whole quantity and 1% is 1/100, 50% of 100 is 50) and relate this to finding 'fractions of'	Use number lines to support pupils in recognising the equivalence between fractions, decimals and percentages. Provide opportunities to explore how the same proportion can be represented in different ways and encourage children to move fluently between forms. Link learning to measures by investigating examples such as 50% of 1 metre being equivalent to one half of 100 centimetres. Use Dienes apparatus to represent percentages visually, for example treating one flat as 100% and using parts of the whole to demonstrate percentage values and equivalent fractions and decimals.		Vocabulary: equivalence, decimal, percentage, fraction, equal Symbols: % =	Fill in the missing numbers in the grid.  How do you know that 50% is the same as a half? How can you show me?

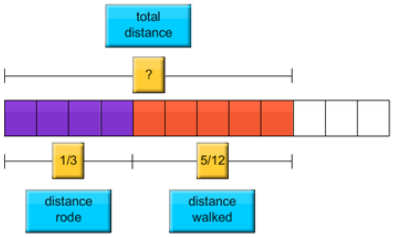
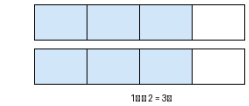
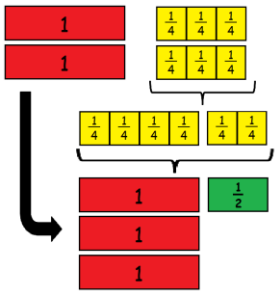
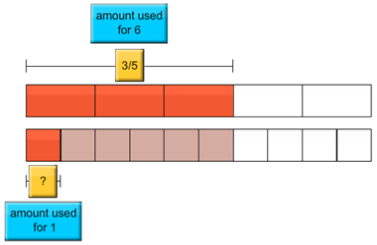
Read and write decimal numbers as fractions [for example, 0.71 = 71/100]	Use Dienes apparatus to represent decimal values and compare these representations to equivalent fractions. Provide opportunities for pupils to represent decimals using a 10 × 10 grid, identifying the proportion shaded and linking this to fractions with denominators of 100. Encourage children to move fluently between decimal and fractional forms and to apply their previous understanding of simplifying fractions where appropriate. Regular discussion should focus on the relationship between decimal fractions and equivalent fractions.	     	Vocabulary: equivalence, decimal fraction, decimal, fraction, equal Symbols: 0.1, 0.01	How could you write this fraction as a decimal? How could you write this decimal as a fraction with a denominator of 100? Can you simplify this fraction?

Recognise mixed numbers and improper fractions and convert from one form to the other	Build upon pupils' understanding of counting in fractions by using number lines to position mixed numbers and improper fractions accurately. Provide opportunities for children to construct fractions using fraction cards and practical resources, exchanging equivalent units where appropriate. Encourage pupils to explore how improper fractions can be represented as mixed numbers and vice versa, making explicit links between the two forms. Use visual models and practical representations to reinforce equivalence and develop confidence when converting between representations.		Vocabulary: denominator, numerator, whole, fraction, equivalent, mixed number, improper fraction Symbols: $\frac{7}{5} = 1\frac{2}{5}$	Tell me a fraction that is bigger than 3. How else could we write it? Show me what eight thirds looks like. What is equivalent to it?
Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths	Provide opportunities for pupils to explore equivalent fractions using a range of visual and practical representations. Encourage children to compare fractions, identify equivalence and explain how different representations can show the same proportion. Use multiplication and division to generate equivalent fractions and investigate how fractions can be simplified to their simplest form. Include examples involving tenths and hundredths to strengthen links between fractions and decimal notation.	 2/5 = 4/10  	Vocabulary: numerator, denominator, decimal point, tenths, hundredths Symbols: =	Show me what ... looks like. How else can we model ...? What fraction is equivalent to ...? How do you know if fractions are equivalent? How can we use multiplication and division to find equivalent fractions?

Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	Provide opportunities for pupils to explore the relationship between tenths, hundredths and thousandths using practical and pictorial representations. Use calculators to investigate decimal and fraction equivalence and encourage children to describe the patterns they notice when dividing by powers of ten. Adapt Dienes apparatus so that one cube represents one whole, allowing unit cubes to represent thousandths. Support pupils in reading, writing and interpreting decimal numbers to three decimal places whilst making clear links to place value and fractional notation.		Vocabulary: numerator, denominator, decimal point, tenths, hundredths, thousandths 3.652 = three point six five two = three units, six tenths, five hundredths and two thousandths = 3652 thousandths Symbols: 1 ÷ 10, 1 ÷ 100, 1 ÷ 1000 $\frac{1}{10}$ $\frac{1}{100}$ $\frac{1}{1000}$	How would you read this number: 1.234? What is the place value of each digit? How many units are there? How many tenths? How many hundredths? How many thousandths?

Compare and order fractions with denominators that all have multiples of the same number	Provide opportunities for pupils to compare and order fractions using a range of visual and practical representations. Use fraction cards, fraction walls and number lines to help children recognise the relative size of fractions and identify equivalent values. Encourage pupils to apply their understanding of simplifying fractions when comparing fractions whose denominators are multiples of the same number. Where appropriate, use calculators to convert fractions into decimal form and use this information to support comparison and ordering.	 	Vocabulary: multiple, numerator, denominator, equivalent, order Symbols: $\frac{1}{2}$ $\frac{1}{3}$ $\frac{2}{3}$ $\frac{1}{4}$ $\frac{3}{4}$ $\frac{1}{5}$ $\frac{2}{5}$ $\frac{3}{5}$ $\frac{4}{5}$ $\frac{1}{10}$ $\frac{3}{10}$ $\frac{7}{10}$ $\frac{9}{10}$ < >	How can you tell how many of each fraction make one whole? (The denominator tells you.) Which is bigger, 1/4 or 1/8? Which do you think would be bigger, 1/50 or 1/100? How do you know? Mark fractions on a number line. What do the fractions have in common?
Read, write, order and compare numbers with up to three decimal places	Consolidate pupils' understanding of reading, writing, ordering and comparing decimal numbers to two decimal places before extending learning to include thousandths. Use place value charts, number lines and practical contexts to reinforce the value of each digit within a decimal number. Encourage children to make links between ordering decimal numbers and ordering whole numbers in the thousands, drawing attention to the significance of each place value position. Provide regular opportunities to compare, sequence and justify decimal values in a range of mathematical and real-life contexts.		Vocabulary: decimal, decimal fraction, decimal point, decimal place, tenth, hundredth, thousandth, significant digit Symbols: < = >	Put these in order: £0.56, 125p, £3.60, 250p, 7p, £5, 205p. Which is the smallest? How do you know? Which is the largest? How do you know? What amount of money comes next: £1.76, £1.86, £1.96...? What length comes next: 1.76m, 1.86m, 1.96m...?

Round decimals with two decimal places to the nearest whole number and to one decimal place	Use number lines to develop pupils' understanding of rounding decimal numbers. Encourage children to identify the two whole numbers surrounding a decimal value and locate the midpoint before deciding which whole number it is closest to. For example, when rounding 3.47, pupils should recognise that the number lies between 3 and 4 and compare its position to the midpoint of 3.5. Extend this understanding by rounding to one decimal place, identifying the surrounding tenths and locating the halfway point. Draw comparisons with rounding whole numbers, such as rounding 347 to the nearest hundred, to reinforce the underlying concept of proximity and place value.		Vocabulary: place value, ten, unit, tenths, hundredths, halfway, nearest, round Symbols: Use decimal notation as appropriate	What is 4.37 rounded to the nearest whole number? I rounded my number to 5. What number (with two decimal places) could it have been? What is the biggest/smallest number I would round to 2? Simon rounded 1.64 to 2. Was he right? Explain how you know. Show me why I would round 2.3 to 2. I am nearly 1.6m tall. How tall could I be?
Add and subtract fractions with the same denominator and denominators that are multiples of the same number and write mathematical statements > 1 as a mixed number [e.g. ⅔ + ⅘ = 6/5 = 1 ⅕]	Use fraction cards, fraction strips and bar models to support children in adding and subtracting fractions with the same denominator and with denominators that are multiples of the same number. Begin with concrete models so pupils can see when fractions need to be converted to an equivalent form before they can be added or subtracted. Where appropriate, make explicit links to equivalence, for example recognising that 4/4 is equal to 1 whole, and that 3/4 can be represented as 6/8. Encourage children to record calculations using mathematical statements and to convert answers greater than one whole into mixed numbers. Use Singapore Bar Models to support reasoning and to help pupils explain each step clearly.		Vocabulary: fraction, part, equal parts, one whole, parts of a whole, number of parts, divide, one half, one third, one quarter, one fifth, one sixth, one tenth, unit fraction, non-unit fraction, numerator, denominator, simplify, equivalence, add, subtract. Symbols: $\frac{1}{2}\ \frac{1}{3}\ \frac{2}{3}\ \frac{1}{4}\ \frac{3}{4}\ \frac{1}{5}\ \frac{2}{5}\ \frac{3}{5}\ \frac{4}{5}\ \frac{1}{10}\ \frac{3}{10}\ \frac{7}{10}\ \frac{9}{10}$ + -	What is ¾ + ⅜? What is ⅘ - ⅕? What is ¾ less than 1½? How do you know? Show me how you worked it out.

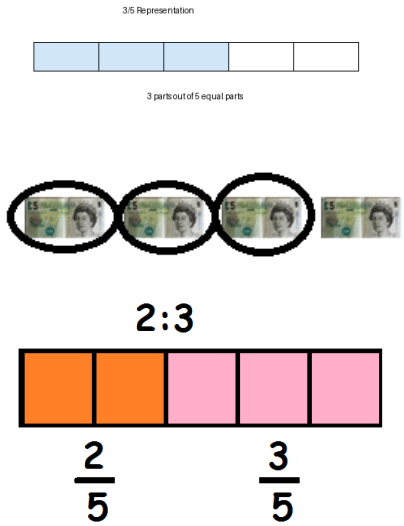
		Alex traveled from his house to the tennis court. He rode 1/3 mile and then walked 5/12 mile. How far did Alex travel from his house to the tennis court?  http://www.mathplayground.com/thinkingblocks.html		
Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	Use fraction cards, fraction strips and pictorial representations to develop pupils' understanding of multiplying fractions and mixed numbers by whole numbers. Encourage children to view multiplication as repeated addition and use concrete resources to build and compare equal groups. Where appropriate, revisit equivalence, for example recognising that 4/4 is equal to one whole, to support the conversion of improper fractions into mixed numbers. Provide opportunities for pupils to represent calculations using diagrams, area models and bar models before moving towards more formal written methods. Use Singapore Bar Models to help children explain their thinking and justify their solutions.	  Chef Cinnamon uses 3/5 cup of oil to make 6 giant cup cakes. How much oil would Chef Cinnamon need to make 1 giant cup cake?  http://www.mathplayground.com/thinkingblocks.html	Vocabulary: fraction, part, equal parts, one whole, parts of a whole, number of parts, divide, one half, one third, one quarter, one fifth, one sixth, one tenth, unit fraction, non-unit fraction, numerator, denominator, simplify, equivalence, multiply. Symbols: × = $\frac{1}{2}$ $\frac{1}{3}$ $\frac{2}{3}$ $\frac{1}{4}$ $\frac{3}{4}$ $\frac{1}{5}$ $\frac{2}{5}$ $\frac{3}{5}$ $\frac{4}{5}$ $\frac{1}{10}$ $\frac{3}{10}$ $\frac{7}{10}$ $\frac{9}{10}$	What is 1¾ × 2? How can you show me? How would you explain to someone else how to do it? Is the answer to 4 × 1¼ equal to 6? How do you know?

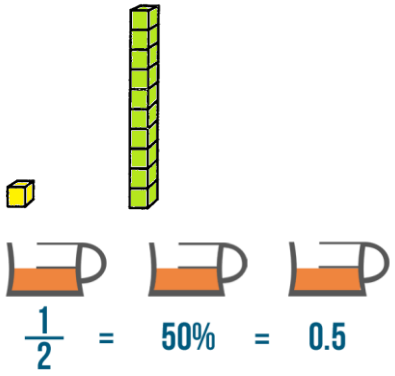
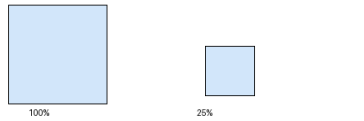
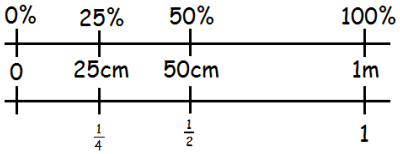
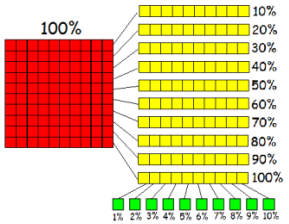
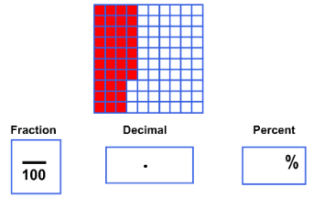
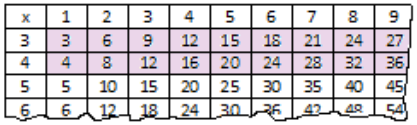
Solve problems which require knowing percentage and decimal equivalents of ½, ¼, ⅕, ⅖, ⅘ and those fractions with a denominator of a multiple of 10 or 25.	Encourage pupils to apply their understanding of fractions, decimals and percentages when solving problems. Support children in using a structured problem-solving approach, such as RUCSAC, to interpret questions, select appropriate representations, carry out calculations and check the accuracy of their answers. Pupils should choose from a range of previously taught models, including bar models and Singapore Bar Models, selecting the most effective strategy for each task. Opportunities for reasoning should be provided through activities such as *Always, Sometimes, Never* statements. Refer to the school's Calculation Policy where appropriate.		Vocabulary: All previously taught fraction, decimal and percentage vocabulary. Symbols: All previously taught fraction, decimal and percentage notation.	Use a range of problem-solving and reasoning activities based on known fraction, decimal and percentage equivalences. Include Always, Sometimes, Never statements. Explain and justify solutions using appropriate mathematical representations. Compare different methods and discuss efficiency and accuracy.
Solve problems involving number up to three decimal places	Encourage pupils to use a structured problem-solving approach, such as RUCSAC, to interpret questions, identify key information, select appropriate representations, carry out calculations and evaluate their answers. Children should be given opportunities to choose from a range of previously taught models and visual representations, including Singapore Bar Models, selecting the most effective strategy for each task. Mathematical reasoning should be developed through discussion and investigation activities, including *Always, Sometimes, Never* statements. Refer to the school's Calculation Policy where appropriate.		Vocabulary: All previously taught decimal, place value and problem-solving vocabulary. Symbols: All previously taught decimal and mathematical symbols.	Use a range of decimal problem-solving and reasoning activities involving numbers to three decimal places. Include Always, Sometimes, Never statements. Explain and justify solutions using appropriate representations. Compare methods and discuss efficiency and accuracy.

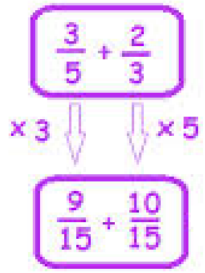
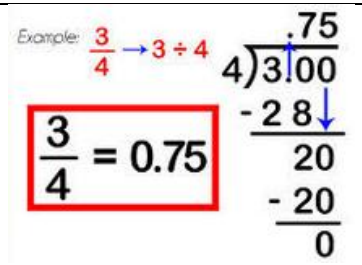
Year 6 – Fractions, Decimals, Percentages and Ratio

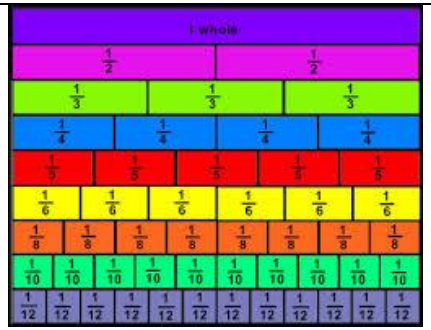
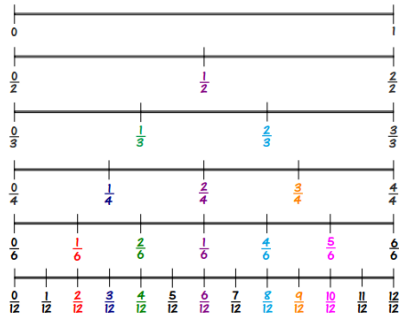
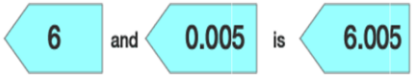
In Year 6, pupils consolidate and extend their understanding of fractions, decimals, percentages and ratio, applying their knowledge with increasing fluency, accuracy and confidence. They develop a deeper understanding of the relationships between different representations of number and use this understanding to solve increasingly complex problems. Pupils build upon prior learning to calculate with fractions, decimals and percentages, explore proportional reasoning, and make connections between ratio, scale factors and algebraic thinking.

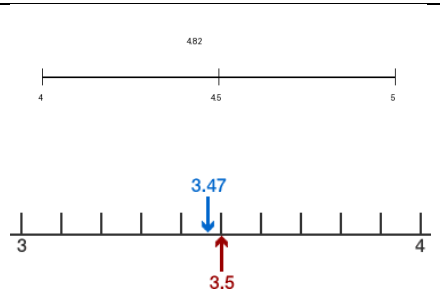
Through the use of practical resources, visual representations and mathematical discussion, pupils are encouraged to explain their reasoning, justify their methods and select efficient strategies when solving problems. Opportunities are provided for children to apply their understanding in a range of real-life contexts, developing resilience, independence and confidence as they prepare for the transition to secondary mathematics.

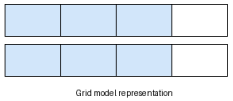
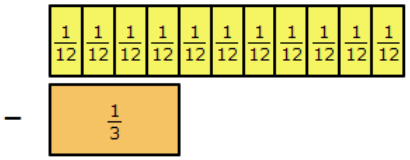
Learning focus / objective	Suggested learning experiences	Key representations	Vocabulary / symbols	Reasoning prompts
Use a variety of images to support their understanding of multiplication with fractions [fractions as operators (fractions of), as numbers, and as equal parts of objects, for example as parts of a rectangle]	Use a range of practical and pictorial models to explore fractions in different contexts. Begin by representing fractions as equal parts of a whole using fraction strips, circles, Cuisenaire rods and shaded rectangles. Encourage children to explore fractions as numbers by placing them on number lines and comparing their relative size. Model fractions as operators by finding fractions of quantities and measures. For example, investigate ¾ of £20, ⅖ of 30 cubes or ⅝ of a metre. Use arrays, bar models and area models to demonstrate how multiplying by a fraction changes a quantity. Encourage children to explain what the numerator and denominator represent and discuss how fractions can be interpreted as "parts of", "equal parts" and "fractions of" quantities. Compare different visual representations and discuss which		Vocabulary: fraction, part, equal parts, one whole, parts of a whole, number of parts, divide, one half, one third, one quarter, one fifth, one sixth, one tenth, unit fraction, non-unit fraction, numerator, denominator, of, equals, multiply Symbols: × ÷ + - / :	How many different ways can you show me...? Can you explain what this model shows? How would you explain...? Does this representation show ...? Why or why not?

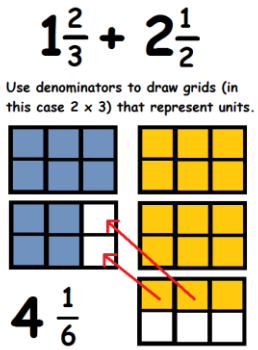
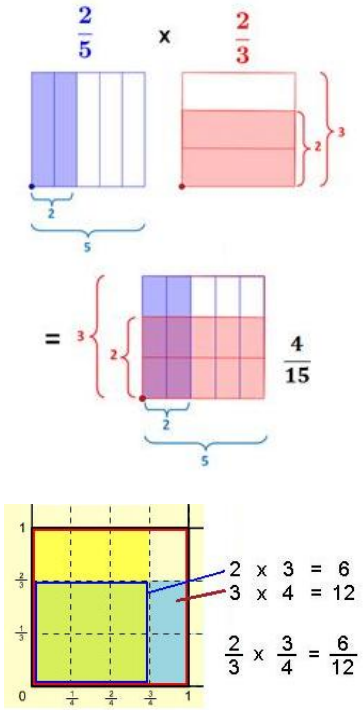
	models are most useful for different problems. In 3/5, the 3 tells you that you have three pieces and the 5 tells you that each piece is one fifth of a whole. One way to read 3/5 is '3 in every 5'.			
Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts	Use number lines, hundred squares, Dienes equipment and percentage grids to explore equivalence between fractions, decimals and percentages. Encourage children to build equivalence webs, for example linking ½, 0.5 and 50%, or ¼, 0.25 and 25%. Provide opportunities to apply equivalence in meaningful contexts such as money, measures and statistics. For example, investigate 50% of 1 metre, 25% of £20 or 0.75 litres. Use matching activities, sorting tasks and missing-value problems to reinforce understanding. Encourage children to justify how they know values are equivalent and identify efficient strategies for converting between forms. Using number lines is an effective way to see the equivalence between the numbers. This could be linked to measure, for example, finding 50% of 1m = $\frac{50}{100}$ of 100cm = (100 ÷ 100) x 50 = 50cm.	  Use Dienes to represent percentages, e.g. 1 flat = 100% and so on. 	Vocabulary: equivalence, decimal, percentage, fraction, equal Symbols: % =	Fill in the missing numbers in the grid.  How do you know that 25% is the same as a quarter and the same as 0.25? How can you show me? Can you represent the same value in more than one way?
Use common factors to simplify fractions; use common multiples to express fractions in the same denomination	Use times table knowledge, factor pairs and multiplication grids to identify common factors and common multiples. Encourage children to investigate which numbers can be used to simplify a fraction and discuss how to recognise when a fraction is in its simplest form.		Vocabulary: numerator, denominator, fraction, proper fraction, improper fraction, equivalent, reduced to, cancel, equal, whole, factor, multiple, simplify Symbols: × ÷ =	What is the missing number? $\frac{7}{10} = \frac{\square}{30}$ How do you know?

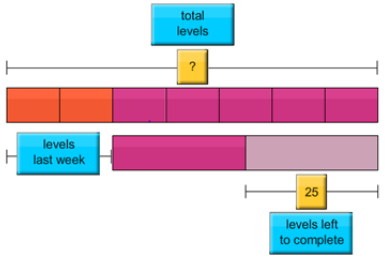
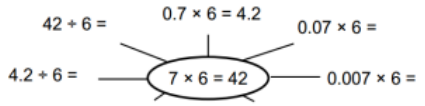
	Use fraction strips, bar models and equivalent fraction diagrams to demonstrate how fractions can be simplified whilst retaining the same value. Explore finding common denominators by generating equivalent fractions and comparing different methods. Encourage children to explain their reasoning and identify the most efficient strategy for simplifying or creating equivalent fractions.			Tell me a fraction that is equivalent to $^{2}/_{3}$ but has a denominator of 9. How did you do it? Find the missing number $\frac{3}{\square} = \frac{12}{16}$ Karen makes a fraction using two number cards. She says, 'My fraction is equivalent to $^{1}/_{2}$. One of the number cards is 6' What could Karen's fraction be? Give both possible answers. What clues did you look for to cancel these fractions to their simplest form? How do you know when you have the simplest form of a fraction?
Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, ⅜]	Use practical examples to reinforce that a fraction can be interpreted as a division calculation. For example, share 3 objects equally between 8 groups and record the calculation as 3 ÷ 8 = ⅜. Use calculators, place value charts and division methods to convert fractions into decimal equivalents. Encourage children to investigate patterns between fractions and decimals and compare equivalent representations using number lines and hundred squares. Discuss the relationship between fractions, division and place value. Use known fractions such as ½, ¼ and ¾ before progressing to more complex examples such as ⅜ and ⅝.		Vocabulary: equivalence, decimal fraction, decimal, fraction, equal Symbols: ÷	Can you find the decimal equivalent of 1/2? Is the decimal equivalent of 2/5 equal to 2.5? How do you know? Can you show me how to convert a fraction into a decimal? What does the decimal tell us about the fraction?

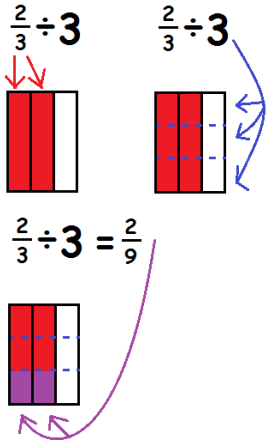
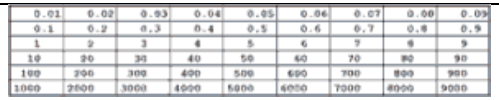
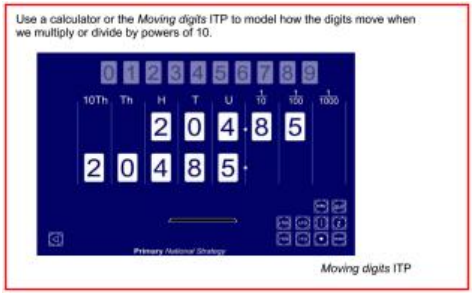
Compare and order fractions, including fractions > 1	Use fraction walls, fraction strips and number lines to compare and order fractions, including improper fractions and mixed numbers. Encourage children to place fractions on number lines and justify their positioning using knowledge of equivalence. Use fraction cards to create sets of fractions for children to order from smallest to largest. Encourage children to convert fractions to equivalent fractions, decimals or percentages where appropriate to aid comparison. Include fractions greater than one and mixed numbers, discussing how these can be represented visually and where they belong on a number line. Explore multiple methods and encourage children to explain which strategy they find most efficient.	 	Vocabulary: fraction, top heavy, improper, proper, decimal, percentage, greater than, less than Symbols: < = >	Which is bigger, 1/2 or 1/3? How do you know? Which is bigger, 1/2 or 1/3? How do you know? Which is larger: $^{1}/_{3}$ or $^{2}/_{5}$? Explain how you know. Arrange these numbers in order: 1 $^{3}/_{4}$, $^{15}/_{8}$, 1.6 - with a calculator and without a calculator. Which way of working do you prefer? Why?
Identify the value of each digit in numbers to 3 d.p.	Use place value charts, place value counters, arrow cards and digit cards to construct decimal numbers to three decimal places. Encourage children to physically move digits between columns to explore how place value affects the value represented. Provide opportunities to partition decimal numbers in different ways and discuss the value of individual digits. Link decimal place value to measures, money and metric units. Use missing digit problems, place value investigations and true-or-false statements to develop reasoning and understanding.		Vocabulary: place value, units, decimal point, tenths, hundredths, thousandths Symbols: Decimal notation as appropriate	Can you tell me what the digit represents in each of these numbers? Which is larger: x mm or y m? Why? How do you know? Can you show your thinking using a place value chart?

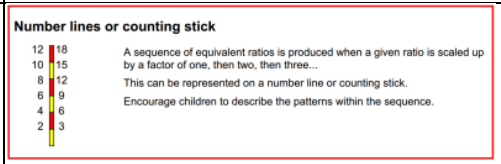
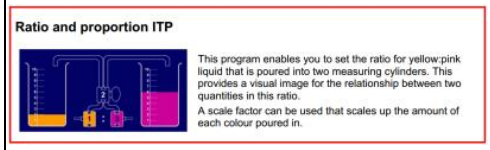
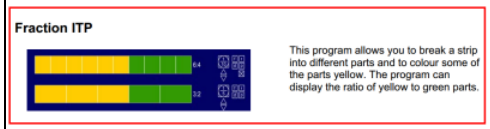
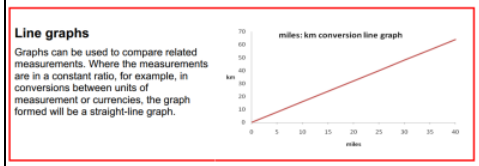
Develop their skills of rounding and estimating as a means of predicting and checking the order of magnitude of their answers to decimal calculations	Use number lines to explore rounding decimals to the nearest whole number, tenth and hundredth. Encourage children to estimate answers before completing calculations and compare estimates with exact answers. Provide children with completed calculations containing errors and ask them to use estimation to identify whether answers are reasonable. Investigate real-life contexts involving money, measures and statistics where estimation is useful. Encourage discussion about why estimation is valuable when checking calculations. Begin with practical problems involving money, measures and sharing situations. Use place value charts and counters to model division calculations before progressing to formal written methods. Explore situations where remainders need to be expressed as decimal values. Encourage children to estimate answers before calculating and compare results with their estimates. Use real-life problem-solving contexts and encourage children to explain how they know their answers are reasonable. Provide problems where children know the value of a unit fraction and must calculate the whole. Use bar models, fraction strips and diagrams to represent the relationships visually. Model multi-step solutions carefully, encouraging children to record each stage clearly. For example, if ⅛ = £5, children should identify that 5 × 5 = £25. Encourage discussion about why multiplying by the denominator restores the whole quantity and explore a variety of contexts including money, measures and quantities.		Vocabulary: place value, ten, unit, tenths, hundredths, halfway, nearest, round, estimate, reasonable, approximate Symbols: ≈	What will be the approximate answer to ...? How did you work it out? Which is the best approximation to ...? Why? How can you use estimation to check your answer?

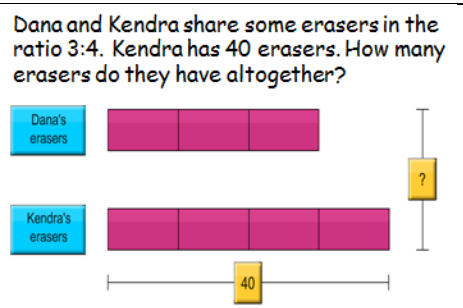
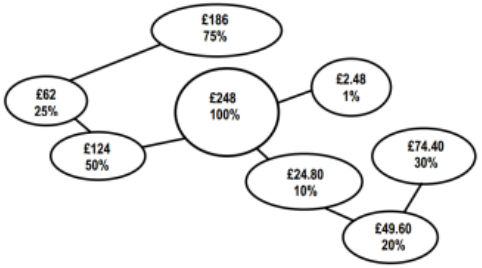
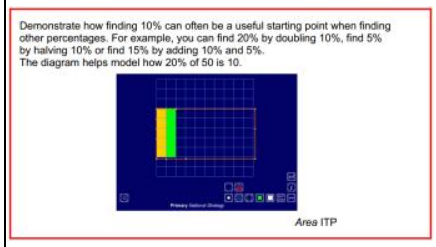
Use written division methods in cases where the answer has up to two decimal places	Begin with practical problems involving money, measures and sharing situations. Use place value charts and counters to model division calculations before progressing to formal written methods.	I earn £186 in a 5 day week. How much do I earn in 3 days? Or What is ⅗ of my weekly £186? 037.20 5 ⟌ 1 ¹8 ³6 . ¹0 0 37.20 3 × 111.60 2	Vocabulary: multiply, divide, numerator, denominator, decimal, decimal point, remainders Symbols: × ÷	Tim has spent £3, which is 4/5 of his pocket money. How much did he have? Over 3 days Jo earns £186. How much money does she earn in a week? Harry weighs 3/8 of the weight of a Shetland pony that weighs 264kg. How much does Harry weigh? How do you know your answer is reasonable?
Use understanding of the relationship between unit fractions and division to multiply a quantity representing a unit fraction to find the whole quantity (for example, if ¼ of a length is 36cm, then the whole length is 36 × 4 = 144cm)	Provide problems where children know the value of a unit fraction and must calculate the whole. Use bar models, fraction strips and diagrams to represent the relationships visually. Model multi-step solutions carefully, encouraging children to record each stage clearly. For example, if ⅛ = £5, children should identify that 5 × 5 = £25. Encourage discussion about why multiplying by the denominator restores the whole quantity and explore a variety of contexts including money, measures and quantities.		Vocabulary: multiply, divide, numerator, denominator, decimal, decimal point, remainders, estimate Symbols: × ÷	Charlie has saved £15 towards buying a computer game. This is 3/5 of the cost of the game. How much does the game cost? If 1/4 of a length is 36cm, what is the whole length? How do you know? Can you explain each step in your method?
Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions	Use fraction strips, fraction walls and fraction cards to demonstrate equivalent fractions and common denominators. Encourage children to decide whether simplifying or finding equivalent fractions is the most efficient approach. Model calculations using grids and visual representations before progressing to abstract methods. Include mixed numbers and improper fractions, encouraging children to convert between forms where appropriate. Discuss common misconceptions and ask children to explain and justify their chosen methods	 Grid model representation $\frac{11}{12} - \frac{1}{3} = ?$ 	Vocabulary: fraction, part, equal parts, one whole, parts of a whole, number of parts, divide, one half, one third, one quarter, one fifth, one sixth, one tenth, unit fraction, non-unit fraction, numerator, denominator, simplify, equivalence, add, subtract Symbols: + - = $\frac{1}{2}$ $\frac{1}{3}$ $\frac{2}{3}$ $\frac{1}{4}$ $\frac{3}{4}$ $\frac{1}{5}$ $\frac{2}{5}$ $\frac{3}{5}$ $\frac{4}{5}$ $\frac{1}{10}$ $\frac{3}{10}$ $\frac{7}{10}$ $\frac{9}{10}$	Of the flags in Jackie's Flag Shop, 3/5 are green and another 1/5 are teal. What fraction of the flags are either green or teal? Sadie's milkshake recipe calls for 3/4 of a scoop of ice cream and Robbie's recipe calls for 1/4 of a scoop. How many more scoops are used in Sadie's recipe? How would you model this calculation? Can you explain why this method is incorrect?

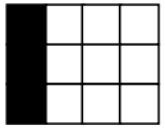
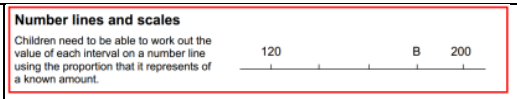
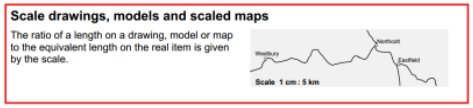
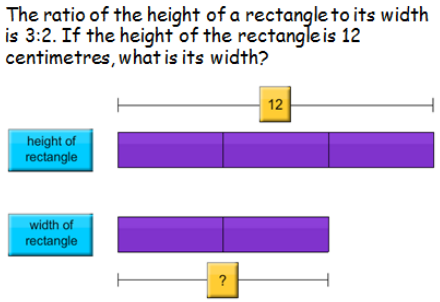
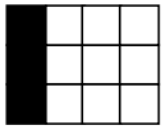
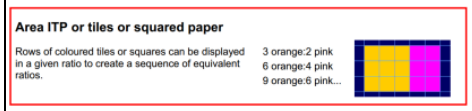
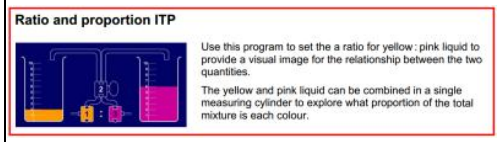
				
Multiply simple pairs of proper fractions, writing the answer in its simplest form [e.g. ¼ × ½ = ⅛]	Use squared paper, area models and paper-folding activities to demonstrate fractions of fractions. Encourage children to interpret multiplication as "of" and explore examples visually before introducing abstract notation. Provide opportunities to shade regions of grids to represent calculations such as ½ of ¼. Discuss patterns that emerge when multiplying fractions and encourage children to simplify answers where appropriate. Use bar models and practical contexts to reinforce understanding.		Vocabulary: fraction, part, equal parts, one whole, parts of a whole, number of parts, divide, one half, one third, one quarter, one fifth, one sixth, one tenth, unit fraction, non-unit fraction, numerator, denominator, simplify, equivalence, multiply Symbols: × = $\frac{1}{2}$ $\frac{1}{3}$ $\frac{2}{3}$ $\frac{1}{4}$ $\frac{3}{4}$ $\frac{1}{5}$ $\frac{2}{5}$ $\frac{3}{5}$ $\frac{4}{5}$ $\frac{1}{10}$ $\frac{3}{10}$ $\frac{7}{10}$ $\frac{9}{10}$	What is a × b? How do you know that c × d = e? How can you show me that f × g = h? What is wrong here? Brad collected 3/4 as many clothes as Nellie. If Nellie collected 2/3 of a bag, how many bags did Brad collect? Angie sold 2/3 as many boxes of melons as Debbie, who sold 1/2 of a box. How many boxes did Angie sell?

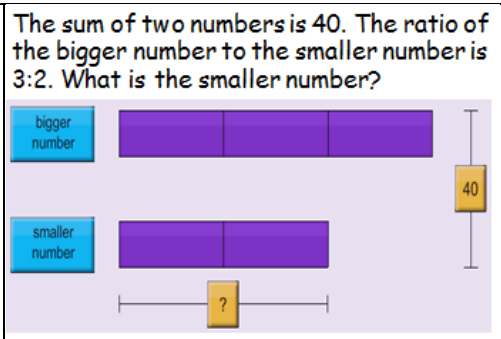
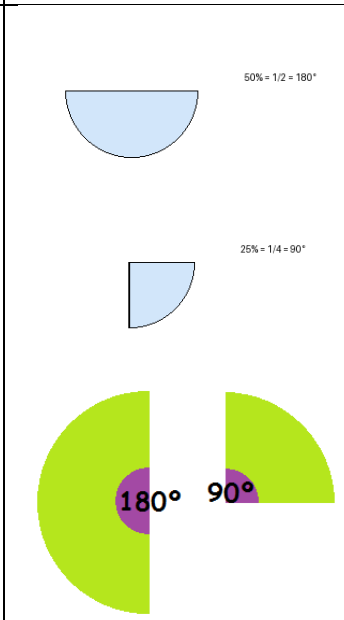
		Sean is playing Cosmic Blobs on his computer. He finished 2/7 of the levels last week and 1/2 of the remaining levels this week. He had 25 more levels to complete. How many levels does Cosmic Blobs have?  http://www.mathplayground.com/thinkingblocks.html		
Multiply one-digit numbers with up to two decimal places by one-digit and two-digit whole numbers, such as 0.4 × 2 = 0.8, and in practical contexts, such as measures and money	Start with known multiplication facts before relating these to decimal multiplication facts; for example, count on and back in steps of 3 before relating this to counting on and back in steps of 0.3. Or 6, 12, 18, 24, 30, 36, ... 0.6, 1. Investigate the relationship between the two sets of numbers. Reinforce the division facts corresponding to multiplication facts; for example: 8 × 0.7 = 5.6 0.7 × 8 = 5.6 5.6 ÷ 0.7 = 8 5.6 ÷ 8 = 0.7 Ensure that children meet and can interpret multiplication and division calculations that are written in a variety of different ways, for example: 7 × 0.8 = 5.6 9 = 5.4 ÷ 0.6 0.3 × 8 = 6 × 0.4 ? Always ask children to check that the size of their answer sounds reasonable. For example, children should recognise that 0.18 ÷ 2 = 0.9 cannot be correct. Using a number line to locate numbers such as 0.18 and then thinking about dividing by two could help children to check the reasonableness of an answer.	 **Counting stick or Counting stick with further options spreadsheet** Use a counting stick to create related sequences, for example count in sixes and then in 0.6s. Ask children to comment on the patterns and relationships between the numbers in the two counts and to use this to predict and explain future terms. Alternatively use the spreadsheet *Counting stick with further options*, showing one sequence above the counting stick and a related one below. 0 6 12 18 24 30 36 42 48 54 60 0 0.6 1.2 1.8 2.4 3 3.6 4.2 4.8 5.4 6 Use the *Number dials* ITP to explore multiples of decimal numbers. Explore known multiplication facts, such as multiples of 6, before exploring related facts such as multiples of 0.6.  *Number dials* ITP What multiplication table does this diagram represent? How do you know? What are the missing numbers? What division facts do you know by using this diagram? **Place-value cards** 0 . 1 0 . 0 5 X 3 0.3 0.15 Carry out multiplication calculations involving decimals by partitioning the decimal number using place-value cards and then multiplying each part separately before recombining to get the answer. | ×	1	0.3
---	---	---
4	4	1.2 | so 1.3 × 4 = 4 + 1.2 = 5.2	Vocabulary: place value, digit, column, decimal point, tenth, hundredth, thousandth, partition, integer Symbols: × ÷ =	If 7 × 6 = 42, what is 7 × 0.6? 0.6 × □ = 5.4 5□ □ = 0.05 How do the multiplication facts help you? What patterns do you notice between whole-number and decimal calculations? How can you check that your answer is reasonable?

Divide proper fractions by whole numbers [e.g. ⅓ ÷ 2 = ⅙]	Use fraction strips, fraction circles and grids to demonstrate sharing fractions into equal groups. Encourage children to physically divide models into smaller equal parts and discuss what happens to the size of each part. Investigate the relationship between division and multiplication by exploring examples such as ½ ÷ 2 and comparing these with ½ × ½. Encourage children to explain why dividing by a whole number creates smaller equal parts and to justify their reasoning using visual models.		Vocabulary: fraction, part, equal parts, one whole, parts of a whole, number of parts, divide, one half, one third, one quarter, one fifth, one sixth, one tenth, unit fraction, non-unit fraction, numerator, denominator, simplify, equivalence, divide Symbols: × ÷ = $\frac{1}{2}\ \frac{1}{3}\ \frac{2}{3}\ \frac{1}{4}\ \frac{3}{4}\ \frac{1}{5}\ \frac{2}{5}\ \frac{3}{5}\ \frac{4}{5}\ \frac{1}{10}\ \frac{3}{10}\ \frac{7}{10}\ \frac{9}{10}$	What is a ÷ b? How can you show me that f ÷ g = h? What is wrong here? I had 1/2 a cake and wanted to share it between two friends. What fraction of the original cake does each friend receive? Can you explain why your method works?
Multiply and divide numbers by 10, 100 and 1000 giving answers up to 3 d.p.	Use place value charts and digit cards to demonstrate the effect of multiplying and dividing by powers of ten. Encourage children to physically move digit cards between columns to show how place value changes. Use place value grids (…tens, units, decimal point, tenths, hundredths, thousandths, …). These could be draw on paper or made into a wall display for children to hold digit cards against. Create numbers and look at effect of dividing by 10, 100 and 1000.Discuss Explore the visual pattern of the digits within division. Explore patterns created by multiplying and dividing by 10, 100 and 1000. Link learning to metric conversions and investigate how prefixes such as centi and milli relate to place value. Use misconceptions deliberately and encourage children to explain errors and correct them.	 	Vocabulary: digit, decimal, multiply, times, divide, share, scale up, scale down, increase, decrease, factor, tens of thousands, thousands, hundreds, tens, units, ones, tenths, hundredths, thousandths Explore the language of units, including prefixes such as centi and milli. Symbols: × ÷	What is … ÷ 10, ÷ 100 or ÷ 1000? What is … × 10, × 100 or × 1000? How do you know? Can you show me how to multiply or divide by ten, one hundred or one thousand? What mistake have I made here?

Solve problems which require answers to be rounded to specified degrees of accuracy	Use RUCSAC (or a similar problem-solving process) to support children in approaching multi-step problems. Encourage children to identify when answers need to be rounded and discuss why different levels of accuracy may be required. Provide opportunities to compare exact and rounded answers and investigate the impact of rounding in different contexts. Use reasoning tasks, Always/Sometimes/Never statements and real-life examples involving measures and money to develop understanding.		Vocabulary: All previously taught rounding, estimation and problem-solving vocabulary. Symbols: All previously taught mathematical symbols.	Use a range of problem-solving and reasoning activities requiring answers to be rounded to a specified degree of accuracy. Include Always, Sometimes, Never statements. Explain and justify solutions using appropriate mathematical representations. Why is this level of accuracy appropriate?
Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts	Provide examples of proportions represented as ratios, fractions, decimals and percentages. Encourage children to move between these representations and identify equivalent relationships. Ensure that children meet proportion described in different ways: • Using everyday language: ten out of 25 children are girls; ten in 25 children are girls. • In simplified form: two out of every five children are girls; two in every five children are girls. • As a fraction: 2/5 of the class are female. • As a decimal: 0.4 of the class are female. • As a percentage: 40% of the class are female. Ensure that children can use and describe ratios in their simplest form, for example 1:3 is the simplest form of the relationship 3:9. Use ratio tables, bar models and practical contexts to investigate scaling quantities up and down. Explore problems involving missing values and encourage children to identify efficient strategies using multiplication and division facts.	    Singapore Bar Method:	Vocabulary: ratio, for every, to every, equivalent, simplify, problem, pattern, relationship, scale up, scale down Symbols: % . × ÷	The ratio of girls to boys at the school play is 5:4. There are 44 boys. How many more girls are there than boys? The sum of two numbers is 40. The ratio of the bigger number to the smaller number is 3:2. What is the smaller number? Mrs Ito has 25 students in her class. 2 out of 5 students stayed after school for play practice. How many stayed for band practice? How do you know the relationship is equivalent?

		 http://www.mathplayground.com/thinkingblocks.html		
Solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison	Use hundred squares, percentage bars and bar models to explore percentages of amounts. Encourage children to find benchmark percentages such as 50%, 25%, 10%, 5% and 1% before combining these to calculate more complex percentages. When finding percentages of amounts, encourage children to work out key percentages such as 50% and 10% to help them to find the required percentage. For example, to find 15% of £40: 10% of £40 = £4 halving gives 5% of £40 = £2 adding these gives 15% of £40 = £6 You are asked to find a given fraction or percentage of an amount. For example Ian scores 80% in a test. There were 40 questions. How many did he get right? Whole test = 100% = 40 questions 10% = 4 questions 80% = 32 questions You are told an amount and asked to work out what fraction or percentage it is of another amount. For example, I score 30 out of 50 in a test. What percentage is this? Whole test = 50 questions = 100% 5 questions = 10% 30 questions = 60%	 	Vocabulary: hundredths, percentage, equivalent, tenths Symbols: %	Find 75% of 200ml. How did you do this? What is 50% of £20? What percentages can you work out mentally? Explain your method. Harry said: 'To calculate 10% of a quantity you divide it by 10, so to find 20% you divide by 20.' What is wrong with Harry's statement? Explain how you would find 35% of an amount with and without a calculator. What is 20% of £60? What is 2% of 300?

Solve problems involving similar shapes where the scale factor is known or can be found	Provide pairs of similar shapes and ask children to identify the scale factor between corresponding sides. Use photocopier enlargement percentages, maps and scale drawings to explore enlargement and reduction. Rehearse scaling proportions up and down. This technique can be used to solve problems. Provide visual images, for example: one in four tiles is black two in eight tiles is black three in twelve tiles are black  The ratio of a distance on a map to the Rehearse scaling ratios up/down. This technique can be used to solve problems: • 5 miles is approximately equal to 8 km (1 kilometre is ≈⅝of a mile) • 10 miles is approximately equal to 16 km • 15 miles is approximately equal to 24 km	  Singapore Bar Method:  http://www.mathplayground.com/thinkingblocks.html	Vocabulary: ratio, scale, up, down, multiply, divide, factors, multiples, quotients, fractions Symbols: × ÷ ≈ =	The ratio of the height of a rectangle to its width is 3:2. If the height is 12cm, what is the width? Two numbers are in the ratio 3:2. If the smaller number is 20, what is the bigger number? For every 4 books that Lily sold, Monica sold 3. Lily sold 16 books. How many books did Monica sell? The ratio of girls to boys in Mrs Wang's class is 3:2. If there are 24 boys, how many girls are in the class? How did you identify the scale factor?
Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples	Provide visual images for ratios then ask children to describe the scenario using the language and notation of ratio, and vice versa:  Each cone has two scoops of chocolate ice cream to every one scoop of strawberry. Ensure that children understand and can use ratios described in different ways:  Using everyday language: there is one black tile to three white tiles; there is one black tile for every three white tiles. Using a colon (use everyday language first, then the colon form): The ratio of black tiles to white tiles is one to every three. The ratio	   Singapore Bar Method:	Vocabulary: problem, pattern, relationship, ratio, proportion, in every, for every, to every, fraction, equivalent, simplify Symbols: : × ÷ = /	The ratio of the number of flags in Eric's collection to the number of flags in Will's collection is 5:4. Will has 16 flags. How many flags do they have altogether? The ratio of jazz tunes to country tunes on Kayla's mp3 player is 6:5. She has 3 more jazz tunes than country tunes. How many jazz tunes does Kayla have? Claire drove 5 out of every 8 miles travelled. Nathan drove 12 fewer miles than Claire. How many miles did Claire drive? Can you represent the relationship in more than one way?

	of black tiles to white tiles is 1:3. The ratio of white tiles to black tiles is 3:1.			
Link percentages or 360° to calculating angles of pie charts	Use paper circles to investigate the relationship between fractions, percentages and angles. Fold and cut circles into equal parts and measure the resulting angles using protractors. Encourage children to build equivalence between fractions, percentages and angles, for example ½ = 50% = 180°. Use pie charts to represent real data and ask children to calculate missing angles and percentages. Encourage discussion about efficient methods and reasoning.		Vocabulary: angles, percentages, fraction Symbols: = ° % × ÷ / .	How many degrees are there in a whole turn or a whole pie chart? What is 50% (or 1/2) of the angles in a pie chart? What is 25% (or 1/4) of a pie chart? How can you show me? Can you fold this circle to show different fractions? What percentage does each fraction represent? How many degrees are represented by each fraction or percentage?