



**Title of Scheme of Learning: Fractions**

**Subject: MATHS**  
**Term: Spring 2**  
**Year: 7**  
**Length of Unit: 6 weeks**

**Big Learning Question:** What is a fraction?

**Big Assessment outcome?** Use equivalent fractions, fractions of amounts, add, subtract, multiply and divide fractions

Success Criteria for Big Assessment Outcome:

**Develop fluency**

- consolidate their numerical and mathematical capability from key stage 2 and extend their understanding of the number system and place value to include decimals and fractions
- select and use appropriate calculation strategies to solve increasingly complex problems
- move freely between different numerical and diagrammatic representations [for example, equivalent fractions, fractions and decimals]
- use language and properties precisely to analyse numbers

**Reason mathematically**

- extend their understanding of the number system
- make and test conjectures about patterns and relationships; look for proofs or counter-examples
- begin to reason deductively in geometry
- interpret when the structure of a numerical problem requires additive, multiplicative or proportional reasoning

**Solve problems**

- develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems
- develop their use of formal mathematical knowledge to interpret and solve problems
- select appropriate concepts, methods and techniques to apply to unfamiliar and non-routine problems

Unit 13 – understand and use equivalent fractions

- Represent fractions using area diagrams, bar models and number lines
- Recognise and name equivalent fractions
- Convert fractions to decimals
- Convert terminating decimals to fractions in their simplest form
- Convert between mixed numbers and improper fractions
- Compare and order numbers (including like and unlike fractions)

Unit 14 – fractions of amounts

- Express one quantity as a fraction of another
- Find a fraction of a set of objects or quantity

Unit 15 – multiply and divide fractions

- Use the unitary method to find the whole given a fractional part
- Multiply a whole number or fraction by a whole number or fraction
- Multiply a mixed number and a whole number
- Divide a whole number or proper fraction by a whole number or proper fraction

**Literacy focus:**

Reading: recognise and identify mathematical terms (e.g numerator, denominator, fractional part, percentage, decimal, quantity, proper fraction)

Writing: write methods systematically

Speaking and Listening: Use mathematical terminology to articulate methods and explanations in proofs.

**Unit 13: Understand and use equivalent fractions**

**Framed work: Weekly review check- up (week 1 – peer assessed and week 2 teacher assessed – followed by mad time student responses)**

Lesson	Learning Objective	Learning Outcomes	Planned Questions	Do Now	Main	Plenary	Differentiation	Mastery Skill (Exit tickets)	H/W
13.1	Find fractional parts of shapes	understand a fraction is a division find fractional parts of shapes represent a whole given a part represent a fraction numerically and in words	What is a fraction? What is an improper fraction? What is an integer? How do you find a fraction of a shape? What is a half? quarter? third? What is a whole? What does the line mean? What is the numerator/denominator? Is the numerator always smaller than the denominator?	What would the whole shapes look like if these are the half shapes?	<u>Talk task:</u> How many ways can you divide the shape? <a href="http://nrich.maths.org/2124">http://nrich.maths.org/2124</a>  <u>Independent task:</u> Create own matching task with a pictorial diagram, written fraction and numerical fraction	Which is the odd fraction out? Why?	Provide matches for independent task  Determine which fractions can be made using the shapes and why	<b>13.1 Find a fraction of a shape</b>	
13.2	Compare fractions to a half	find a fractional part of a shape represent a fraction on a grid compare and order fractions using pictorial representations compare fractions to a half	What is a quarter? What is a fraction? Which of these shapes are divided into four quarters? What is the same/different about the divisions? How will you shade these fractions of the grids? What information do you need to know? Where would these be on a number line? Which of these are less than/greater than a half? What is a numerator? What is a denominator?	Find 6 ways of cutting a square into quarters. How does the question change if you have to cut a rectangle?	<u>Talk task:</u> shade the diagrams and put the fractions in order of size – add in the extra fractions and draw diagrams to represent them  <u>Independent task:</u> “more than half” - pick a denominator, shade the	3/5 is bigger than 2/3 because 5 is bigger than 3.  True or false?	Reduce number of fractions in the talk task  Represent non unit fractions, explain the process of representing a fractional part using mathematical terminology		

			What do you notice about the relationship between the numerator and denominator if the fraction is less than a half?		number of squares that represent its unit fraction. Use this to determine what the numerator must be to make it over a half. Find fractions that lie between a quarter and a half.				
<b>13.3</b>	Express an improper fraction as a mixed number	represent fractions on a number line compare and order numbers convert between improper fractions and mixed numbers	What is a fraction? What is the numerator/denominator? How can I use these to put them on the number line? What value are they greater/less than? How can an integer be represented as a fraction? What is the same or different about the groups? Is the numerator always less than the denominator? How many quarters/fifths, etc. do you have? How many wholes is this? How do you know? What does the bar model represent?	Order the fractions from smallest to biggest on the number line. How many different ways can you write them?	<u>Talk task:</u> group the fractions. If you could only use 2 groups, how would you group them?  <u>Independent task:</u> Which is bigger (improper fraction/whole number)? Find the difference between the smallest and biggest number. Find the sum of the three smallest numbers.	Are the two numbers equivalent? How is the numerator 18?	Represent fractions on grids, provide bar model templates  Create own number line (with divisions) to place fractions, find more than one way to numerically represent a given fraction	<b>13.2 I can express an improper fraction as a mixed number</b>	
<b>13.4</b>	Convert mixed numbers into improper fractions	convert between mixed numbers and improper fractions understand how multiples help with converting between the two	What is a proper/improper fraction? How do you convert between improper fractions and mixed numbers? What does the bar model represent? What is the value of the part/whole? How can you tell how many whole numbers there are? How many quarters/fifths, etc. are in a whole?	Find as many improper fractions as you can using only the digits 1, 2 and 3	<u>Talk task:</u> Which of the mixed numbers would have the same numerator once converted into an improper fraction? Can you find other examples?  <u>Independent task:</u> What mixed number	Show me a fraction between 3 and 4 with a denominator of 7.	Provide bar model templates, use multilink to represent  Find improper fractions that lie between particular values, use algebraic notation to generalise	<b>13.3 I can express a mixed number as an improper fraction</b>	

		recognise where fractions would be on the number line	How do multiples help with finding which numbers the fraction lies between?		am I? e.g. my numerator is 36 and I have an odd denominator.				
<b>13.5</b>	Simplify fractions	represent fractions in grids represent fractions in bar models compare fractions create equivalent fractions	How can two fractions be the same? What does 'same' mean? What does the bar represent? How are the bars the same/different? What is the relationship between the numerators and denominators? What fraction of the whole do these represent? How do you know? Which shapes are the same size? What are the missing numbers? Why? Can you explain how to create an equivalent fraction?	Which fractions are the same? Why?	<b>Talk task:</b> What fraction of the larger triangle do the pieces of the triangle represent? Use the triangle pieces to make fraction equivalences  <b>Independent task:</b> Use the numbers to fill in the gaps using the fraction wall. How many solutions are there?	Use the numbers 1 – 10 to fill in the inequality. Can you do it for another fraction? Why?	Provide bar models and model examples  use manipulatives to explain fractional equivalence, link to multiples and factors	<b>13.4 I can simplify fractions</b>	
<b>13.6</b>	Order fractions using equivalence	order fractions with like denominators compare fractions with different denominators find equivalent fractions find the lowest common multiple of a set of numbers	What is a fraction? How do we know the size of a fraction? How can we compare fractions with like denominators? How can we compare fractions with different denominators? Which is the biggest/smallest? Why? What does the whole bar represent? What do the parts represent? What does the denominator tell us? What does the numerator tell us? How can you prove the order of size?	Find the odd one out in every group of fractions. What is the reason?	<b>Talk task:</b> Make 10 comparisons between the fractions using < and > symbols. Draw a bar model to show how you can compare them  <b>Independent task:</b> "Always, sometimes, never true". Find examples for when the rule works and doesn't work using examples	By arranging the fractions in order of size, which fraction is in the middle?	Use fraction walls  Use manipulatives to demonstrate relative size of fractions, link fraction equivalence to LCM	<b>13.5 I can order fractions using equivalence</b>	

13.7	Convert fractions to percentages	<p>identify factors of 100</p> <p>convert fractions to percentages using equivalence</p> <p>write one amount as a fraction of another</p> <p>represent percentages and fractions on grids</p>	<p>What is a fraction?</p> <p>What is a percentage?</p> <p>How are fractions and percentages related?</p> <p>How can this &lt;fraction&gt; and this &lt;percentage&gt; represent the same number?</p> <p>What is important about a denominator of 100?</p> <p>What denominators could we convert to a denominator of 100?</p> <p>How could factors of 100 be used?</p> <p>What does a percentage greater than 100% mean?</p> <p>How can we represent these numbers on a 100 grid?</p> <p>How do we simplify fractions?</p>	Which fractions can you change to have a denominator of 100?	<p><u>Talk task:</u> Match the percentage to 3 equivalent fractions</p> <p><u>Independent task:</u> True or false statements. 65% is the answer, what is the question?</p>	Henry has a hole in his bucket. What fraction of water is left? What % of water has been lost?	<p>Use 100 grids to compare fractions and percentages and find factors of 100</p> <p>simplify fractions to lowest terms, describe what a percentage more than 100 means, define percentage using etymology</p>	13.6 I can convert fractions to %	
13.8	Convert fractions to decimals	<p>find equivalent fractions</p> <p>recognise factors of powers of 10</p> <p>use written division to divide two numbers</p> <p>convert fractions to decimals</p> <p>represent decimals as fractions</p>	<p>What is a fraction?</p> <p>What is the numerator/denominator?</p> <p>What operation could be represented using fractional notation?</p> <p>What is a decimal?</p> <p>How are fractions and decimals related?</p> <p>How could you describe a decimal in tenths and hundredths?</p> <p>How could you write a decimal as a fraction?</p> <p>How could you solve this division?</p> <p>How could you use approximation to check your answer?</p> <p>When should fraction equivalence be used? Why?</p>	Using the numbers 1 – 10, create fractions which can be converted to percentages using fraction equivalence. How many unique percentages can you create that do not exceed 100%?	<p><u>Talk task:</u> - Doughnut Dominos - <a href="http://nrich.maths.org/6945">http://nrich.maths.org/6945</a> What fractions can you find that give a decimal of 0.2?</p> <p><u>Independent task:</u> Which of the sets (decimal, percentage and fraction) make over 1? How can you tell?</p>	<p>Show me a decimal that's bigger than...</p> <p>Show me a decimal that's smaller than...</p> <p>(nrich pairs game)</p>	<p>Use place value grids and counters for division</p> <p>find fractions/decimals that a filled 100 grid could represent, explain when to use equivalence and when to use division</p>	13.7 I can convert fractions to decimals	

13.9	Convert decimals to fractions	<p>understand the value of each digit in a decimal</p> <p>convert between decimals and fractions</p> <p>represent fractions and decimals on number lines</p> <p>compare and order fractions and decimals</p> <p>solve worded problems</p>	<p>What is a fraction?</p> <p>What is a decimal?</p> <p>How are fractions and decimals related?</p> <p>How many tenths/hundredths/thousandths does this decimal have?</p> <p>How could we write this as a fraction?</p> <p>How are these fractions related?</p> <p>What does simplifying fractions mean?</p> <p>Could you find other equivalent fractions?</p> <p>Why might we want to simplify fractions?</p> <p>Is this bigger/smaller than <math>&lt;&gt;</math>? How do you know?</p> <p>What methods do we have of comparing fractions?</p>	<p>Which of the pictures represents the decimal? How do you know?</p>	<p><u>Talk task:</u> Pick two decimals, one from the circle, one from the triangle. Find a fraction that lies between the two. Put all three numbers of a number line.</p> <p><u>Independent task:</u> Correct the mistakes. Create 3 problems and solutions of your own. Two of the problems must be deliberately incorrect.</p>	<p>I have 5 tenths and 34 hundredths. What is this as: a) a fraction? b) a decimal?</p>	<p>Use multiplication grid, fraction wall</p>		
13.10	Compare and order fractions	<p>find equivalent fractions</p> <p>convert between fractions, decimals and percentages</p> <p>compare and order fractions</p> <p>solve worded problems</p>	<p>How can we compare fractions?</p> <p>What values do these fractions lie between?</p> <p>How can we represent the fractions on these grids?</p> <p>What does equivalence mean?</p> <p>What is a percentage?</p> <p>How are percentages linked to fractions?</p> <p>What is a decimal?</p> <p>How can we describe this decimal as a fraction?</p> <p>When would equivalence be useful to compare fractions?</p> <p>When would conversion be useful for comparison?</p> <p>Which representation is most accurate? Why?</p>	<p>Which shape has the most area shaded? How do you know?</p>	<p><u>Talk task:</u> Match the statements about the cupcakes to a fraction, division and decimal. Put the answers in ascending order. Which group would you want to be in?</p> <p><u>Independent task:</u> Chocolate bar problem - <a href="http://nrich.maths.org/34">http://nrich.maths.org/34</a></p>	<p>Which table would you sit on to get the most chocolate? Which table would give you the least chocolate?</p>	<p>Provide an answer framework</p> <p>Compare methods of ordering fractions</p>	<p><b>13.8 I can compare and order fractions/decimals/%</b></p>	
<b>Unit 14: Fractions of Amounts</b>									

14.1	Find a unit fraction of an amount	demonstrate finding a fraction of an amount using rectangle area understand how to find a fraction of a quantity divide a number into equal parts	<p>What is a fraction?</p> <p>How do you find a fraction of an amount?</p> <p>Is a fraction of an amount always smaller than the original amount?</p> <p>What is a unit fraction?</p>	<p>How much of each food would get eaten if it was shared equally among 8 people. How would the amounts change if there were only 3 people?</p>	<p><u>Talk task:</u> Colour in <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{1}{6}</math> and <math>\frac{1}{12}</math> of the shape. What do you notice? What other rectangles do this? What is the pattern?</p> <p><u>Independent task:</u> Use fractions of an amount to find the missing words. Rearrange to make a maths joke!</p>	Show me a question with an answer of...	<p>divide shapes into unit fractions</p> <p>prove using fraction addition, use questions with non-integer answers</p>	14.1 I can find a unit fraction of an amount	
14.2	Find a non-unit fraction of an amount	<p>Demonstrate using bar models how to find a fraction of an amount by sharing into equal parts and shading.</p> <p>Understanding the role of the numerator and denominator</p>	<p>What is a fraction?</p> <p>How do you find a fraction of an amount?</p> <p>Is a fraction of an amount always smaller than the original amount?</p> <p>What is a unit fraction?</p> <p>What role does the numerator play when finding fractions of amounts?</p>	<p>What fraction of time did each student play on stage in the concerts?</p>	<p><u>Talk task:</u> show me <math>\frac{1}{4}</math> of the cubes, show me <math>\frac{3}{4}</math> of the cubes.</p> <p><u>Independent task:</u> "Using bar models find the non unit fractions of the amount below</p>	Jason wins money, he gives x fraction to BOB, y fraction to Jenny, how much does he have left?	<p>Drawing bar models – labelling and shading the required amount</p> <p>Looking at problem solving, using money and multiple fractions in one question.</p>	14.2 I can find a non-unit fraction of an amount	

							prove using fraction addition, use questions with non-integer answers		
14.3	Use and apply fractions of amounts	<p>find a fraction of an amount</p> <p>sketch triangles and quadrilaterals</p> <p>use the sum of the interior angles of a triangle/quadrilateral</p> <p>understand and use angle definitions</p> <p>simplify fractions</p>	<p>What is a fraction?</p> <p>How do we find a fraction of an amount?</p> <p>How do fractions relate to percentages?</p> <p>What is the sum of the interior angles of a triangle?</p> <p>What is a right angle?</p> <p>How does the sum of the interior angles of a quadrilateral differ to a triangle?</p> <p>How do you find two thirds of a number?</p> <p>What is an acute/obtuse and reflex angle?</p> <p>How can both the answers be correct?</p> <p>What does simplest form mean?</p> <p>How do we simplify fractions?</p>	<p>True or false?</p> <p>100 grid number facts</p>	<p><u>Talk task:</u> Sketch two different triangles and quadrilaterals where two of the angles sum to two thirds of the total sum of the interior angles of the shapes</p> <p><u>Independent task:</u> What fraction of the interior angles of these shapes does the red angle represent?</p>	<p>Which angle represents the most of the total interior angles for its shape? Why?</p>	<p>give one angle in the triangle/quadrilateral talk task</p> <p>find the fraction the labelled angles make of the interior angles of a compound shape formed from the triangles quadrilaterals, find the whole given the fraction</p>	14.3 I can use and apply fractions of amounts	
14.4	Working with a fraction of an amount	<p>demonstrate finding a fraction of an amount</p> <p>using bar models</p> <p>interpret problems involving finding a fraction of an amount</p>	<p>When finding a fraction of an amount, why divide by the denominator?</p> <p>What does the numerator tell you?</p> <p>What happens to the size of the answer when using a proper/improper fraction?</p> <p>What do the parts of the bar model represent?</p>	<p>What fraction of marbles did Andy have left?</p> <p><a href="http://www.nrich.maths.org/2421">www.nrich.maths.org/2421</a></p>	<p><u>Talk task:</u> Match up the pairs of fractions of amounts. Draw bar models to represent them.</p> <p><u>Independent task:</u> Represent</p>	<p>2/3 of £45 is £30. Explain the method. How could you then find a half of the total number. Is there more</p>	<p>use cubes and counters to represent each part</p>		

		understand the reasoning behind the processes involved	How can you use a bar model to find the whole given the fraction?		the problems on a bar model and solve them e.g. $\frac{5}{6}$ of a number is 35. What is a half?	than one method?	give improper fractions in questions, use questions with non-integer answers		
14.5	<b>Recognize fraction fact families</b>	To spot the relationship between dividing by integers and multiplying by fractions. To be able to write the same calculation in different formats	Multiplying by $\frac{1}{2}$ has what impact on the amount? What is it the same as? What fact families do we know about integers? What does 'of' mean in maths?	Integer fact families	Talk task – What is the same or different about these representation? Independent task How many different ways can you express these calculations?	Group together the fact families	Gap fills – multiplying by $\frac{1}{2}$ is the same as dividing by _____  Create your own fact families.		
<b>Unit 15: Multiplying and Dividing</b>									
15.1	Multiply a fraction by an integer	find fractions of amounts use order of operations represent multiplications/divisions in different ways multiply a fraction by an integer	What does 'of' mean in maths? How do we find a fraction of this shape? What does the model show? Does the order of division and multiplication make a difference? What other ways can you write this multiplication? What does the line mean in a fraction? How are these equivalent? How many different ways can you arrange these equations? How are they the same/different? Is multiplication by a fraction different to multiplication by an integer?	Put numbers in the boxes to make the expression true. There are 9 possible answers – can you find them all? How does this change if the numerator is 2?	<u>Talk task:</u> Shade $\frac{2}{3}$ of the grid. How many ways can you find of multiplying a fraction by an integer to make $\frac{2}{3}$ ?  <u>Independent task:</u> Rearrange the digits in the multiplications to correct the mistakes.	Who is right? $7/8 \times 4$	use a smaller grid in the talk task and multilink cubes to represent the grid  explore different sized grids and possible multiplications that can be represented. Rearrange equations in as many different ways to get the same answer	<b>15.1 I can multiply a fraction by an integer</b>	

15.2	Find a fraction of a fraction	<p>find a fraction of an amount</p> <p>multiply a fraction by an integer</p> <p>multiply two fractions</p> <p>represent multiplications using bar models</p>	<p>What does multiply mean?</p> <p>How do we multiply a fraction by an integer?</p> <p>What does the model represent?</p> <p>What does a single bar represent?</p> <p>What is an improper fraction?</p> <p>How can we convert between mixed numbers and improper fractions?</p> <p>How can we use brackets/order of operations to change the answer?</p> <p>What does 'of' mean in maths?</p> <p>How is finding a fraction of an amount related to multiplication?</p> <p>How can you represent this using bar models?</p>	Which of the cards are equal to 3?	<p><u>Talk task:</u> How many ways can you find of getting 8 squares by using two fractions (e.g. shade <math>\frac{2}{3}</math> and then <math>\frac{1}{4}</math> of that amount)</p> <p><u>Independent task:</u> How many ways can you find of making an eighth using two fractions?</p>	What is the relationship between finding a fraction of an amount and multiplying ?	<p>start with a smaller grid in the talk task</p> <p>represent answers in different ways (mixed numbers, improper fractions), draw bar models to represent answers</p>		
15.3	Multiply two fractions	<p>represent a fraction on a grid</p> <p>find a fraction of an amount</p> <p>multiply two fractions</p> <p>simplify fractions</p>	<p>What is a fraction?</p> <p>What fraction of the grid is shaded?</p> <p>What fraction of the shaded part is crossed?</p> <p>How do you find a fraction of an amount?</p> <p>What is the same/different about the grids?</p> <p>What amount is left unshaded?</p> <p>What is the relationship between the shaded/unshaded parts?</p> <p>What does 'of' mean in maths?</p> <p>How do we multiply two fractions?</p> <p>Does your method work for all fractions?</p> <p>How can you show this?</p>	Find the total fraction that is shaded	<p><u>Talk task:</u> Match the picture to the multiplication and give the resultant fraction. Draw a grid to represent the multiplications</p> <p><u>Independent task:</u> What fraction of the multiplications are equal to a quarter?</p>	How are the fraction multiplications the same and different?	<p>provide some example answers in the matching task</p> <p>Use algebraic fractions, investigate representations of multiplications using improper fractions</p>	15.2 I can multiply two fractions	

<p><b>15.4</b></p>	<p>Multiply mixed numbers by integers</p> <p>Solve problems involving length and perimeter</p>	<p>multiply two fractions</p> <p>convert between improper fractions and mixed numbers</p> <p>recognise equivalent fractions</p> <p>find the perimeter of a shape</p>	<p>How do we multiply fractions?</p> <p>What does the line mean in fractions?</p> <p>Is the order of multiplication important?</p> <p>Where would the answers be on a number line?</p> <p>How could you use estimation?</p> <p>How can you express an integer in fraction form?</p> <p>What does a single bar represent?</p> <p>How does the model represent the answer?</p> <p>What is an improper fraction?</p> <p>How can we convert to mixed numbers?</p> <p>Why would we convert to mixed numbers?</p> <p>Where are the mistakes?</p> <p>How can you tell if this is correct or not?</p> <p>Can you multiply fractions in more than one way?</p> <p>Why?</p>	<p>Use the digits 1-6 to fill in the gaps of the fraction multiplications. How many answers can you create between 1 and 2?</p>	<p><u>Talk task:</u> Draw bar models to show how many bananas each of the monkeys have. If monkey B had half as many bananas as monkey C, what fraction of the original 12 bananas would he have?</p> <p><u>Independent task:</u> Which regular shape has a perimeter closest to 10cm?</p>	<p>Spot the mistakes!</p>	<p>use multilink to represent the number of bananas, provide an answer framework in independent task</p> <p>given a bar model, determine the multiplication, find and explain different ways of multiplying fractions</p>		
<p><b>15.5</b></p>	<p>Multiply mixed numbers</p>	<p>convert between mixed numbers and improper fractions</p> <p>multiply fractions (including mixed numbers)</p> <p>find the area of a rectangle</p> <p>represent fraction multiplication using area</p>	<p>What is area?</p> <p>Why is multiplication relevant to area?</p> <p>How do you find the area of a rectangle?</p> <p>How do you know the lengths of the other sides?</p> <p>How are these shapes the same/different?</p> <p>How can you find the side length given the area?</p> <p>How does this grid represent the area?</p> <p>What does each square represent?</p> <p>How do we determine the value of the length of each square?</p> <p>How is the length different to the area?</p> <p>What is fraction simplification?</p> <p>How/why do we simplify fractions?</p>	<p>Find the area of the rectangles</p>	<p><u>Talk task:</u> Use multilink cubes to build an area model showing the multiplication of the fractions.</p> <p><u>Independent task:</u> Find 5 different rectangular areas that have an area of between 6 and 7m<sup>2</sup>. Put them in order of size from smallest to largest</p>	<p>Put the platforms in order of size from smallest to largest area</p>	<p>convert numbers into improper fractions before talk task</p> <p>find side lengths given the area, given an area, find the multiplications it could represent</p>		

15.6	Find the whole given the fractional part	<p>multiply</p> <p>divide</p> <p>find a fraction of an amount</p> <p>find the whole given a fractional part</p> <p>represent questions using bar models</p>	<p>What is each square worth?</p> <p>How do you know?</p> <p>What does that mean about the values of the other shapes?</p> <p>Which are more than one/less than one?</p> <p>Which are close to a half?</p> <p>What equations could this model represent?</p> <p>What is the whole/part?</p> <p>How are the parts and wholes related?</p> <p>What do the arrows show?</p> <p>How can we create a question using this model?</p> <p>What information do we need to know?</p> <p>How are these models the same/different?</p> <p>Can one model be used to represent more than one question?</p> <p>Can one question be represented by more than one bar model?</p> <ul style="list-style-type: none"> <li>•</li> </ul>	<p>If the blue rectangle is 1, what are the values of the other shapes?</p>	<p><u>Talk task</u>: write a question for each bar model. Is there another way you could draw it?</p> <p><u>Independent task</u>: Swap bar models – match the bar models to their questions. Use this to solve the problems. Could you combine your bar models to form new questions?</p>	<p>If the whole area is valued at £220000, how much is each house worth? What information do you need to work this out?</p>	<p>provide example questions for the bar models</p> <p>find a different question for the same model, find a new way to draw the models given the question</p>		
15.7	Finding new amounts given a fractional part	<p>find a fraction of a whole</p> <p>find the whole given a fractional part</p> <p>draw bar models to represent a problem</p> <p>interpret bar models in the context of a problem</p>	<p>What is the total savings?</p> <p>How do you know?</p> <p>How could you show this using a diagram?</p> <p>What is the process being applied to find the answer?</p> <p>How can you show these problems on a bar model?</p> <p>What does the bar/part represent?</p> <p>Why are there <math>\lt \gt</math> equal parts to this model?</p> <p>How can you use these models to find the answer?</p> <p>Could you draw a different model? Why?</p> <p>What question could this represent? Why?</p> <p>If <math>\lt \gt</math> is not chocolate, what fraction is chocolate?</p> <ul style="list-style-type: none"> <li>•</li> </ul>	<p>Calculate the amount of money in savings for each person</p>	<p><u>Talk task</u>: Draw a bar model to represent the total number of ice creams sold each day. How many did he sell each day?</p> <p><u>Independent task</u>: How many ice creams were sold at each place in the UK?</p>	<p>Write a question to fit the bar model</p>	<p>provide bar model examples to match to problems</p> <p>create more than one bar model for the problems, explain methods using manipulatives</p>		

15.8	Divide an integer by a fraction	<p>multiply a fraction by an integer</p> <p>divide an integer by a fraction</p> <p>represent multiplication and division using bar models</p>	<p>How do we multiply a fraction by an integer?</p> <p>What does multiplication mean?</p> <p>What is the inverse of multiplication?</p> <p>How could I write this multiplication differently (order/division)?</p> <p>What does division mean?</p> <p>How could I write this division as a multiplication?</p> <p>What does this bar model represent?</p> <p>How many <math>\langle \rangle</math> are in <math>\langle \rangle</math>?</p> <p>How can we show this pictorially?</p> <p>How can we compare the size of fractions?</p> <p>Is the answer to a division always smaller than the number being divided?</p> <p>When is it smaller? When is it bigger?</p> <ul style="list-style-type: none"> <li>•</li> </ul>	Write the missing number so that the multiplications are 3	<p><u>Talk task:</u> Draw bar models to represent the divisions. Use the bar models to solve them and put the answers in descending order</p> <p><u>Independent task:</u> Draw bar models to represent the divisions. Use the bar models to solve them and put the answers in ascending order</p>	Dividing a number by another number always gives a smaller number than the original. True or false?	<p>provide blank bar models for independent task</p> <p>compare the size of answers on a number line, create a division which gives the same answer as ...</p>		
15.9	Divide unit fractions	Draw bar models to represent the divisions. Use the bar models to solve them and put the answers in descending order	<p>What does division mean?</p> <p>How can we divide an integer by a fraction?</p> <p>What does each square represent?</p> <p>What fractions could you represent with this model?</p> <p>Why?</p> <p>What is the lowest common multiple?</p> <p>What is a common denominator?</p> <p>What is the same/different about these fractions?</p> <p>How can we find a common denominator for these fractions?</p> <p>What does the line represent?</p> <p>What do you notice about the divisions?</p> <p>Is this true for all fractions?</p> <p>How can we prove this?</p>	Spot the mistakes in the dividing fractions calculations	<p><u>Talk task:</u> Build or draw a model to represent the divisions. What does each square represent? Why?</p> <p><u>Independent task:</u> Use models to investigate what happens with these fractions. Is there a general rule?</p>	To divide one fraction by another, you take the denominator of the second fraction and put it as the numerator of the first. Is there a more mathematical way of explaining this?	<p>match fractions to models</p> <p>given a model, what could it represent? Non unitary-fractions?</p>	15.3 I can divide two fractions	
15.10	Divide two fractions  Multiply fractions	find equivalent fractions  multiply two fractions	<p>What does this model represent?</p> <p>What does each square represent?</p>	Which fractions could this pictorial model represent?	<u>Talk task:</u> Group the divisions in a way you like	Which of the algebraic fractions	match models to divisions		

		divide two fractions understand order of operations	How does the value of each square change as the division changes? Is there a more efficient model to use? Why? How are these the same/different? What processes are being applied here? How could you explain fraction division to someone? How could you model fraction division for someone? What is an improper fraction? What is a mixed number? Where would these be placed on a number line? How do you know?		and explain mathematically why you have grouped them like that. How can you put them into two groups?  <u>Independent task</u> : Find which answer is closest to 1. Do the brackets make a difference to the answer?	are true? How do you know?	generalise and prove findings about fractions and division using algebraic notation, does brackets make a difference?		
15.11	Pre cancelling	To be able to spot when fractions will need simplifying when calculating and to be able to simplify them beforehand.	Can you predict which fractions will need simplifying at the end? Write a calculation that will need simplifying and write one that won't. What does common factor mean? How many different ways can you pre-cancel?	Group the following fractions	Talk task – can you predict which fractions will need cancelling at the end?  Independent Task – complete the calculations, pre-cancelling where possible.	Spot the mistake			

**Curriculum Links to Oasis 9 habits Values:**

Students are encouraged to interact with **patience** towards one another's contributions in class and support and help each other where appropriate. They are encouraged to be **compassionate** towards other student's efforts and contributions; supporting and celebrating where appropriate exercising **consideration** where others may find something more challenging than themselves. Students are encouraged to see the **joy** that can be taken in mathematics and that it can be studied for the pleasure of it. Students are encouraged to understand that resilience is developed through **self-control** of one's reaction to challenging situations (including work one finds difficult. Students are encouraged to demonstrate **self-control** in terms of their interactions within the classroom. Students are encouraged to be **humble** in terms of understanding their achievements on the journey towards their GCSEs and the role they can play in supporting others along this journey. Students are encouraged to be **honest** when reflecting on their progress to accurately identify the best areas to focus on for development. This **honesty** is also encouraged in terms of owning one's own mistakes or poor choices within the classroom setting.

**Resources to support teaching and learning**

[www.mathematicsmastery.org](http://www.mathematicsmastery.org) (toolkit),  
[www.vle.mathswatch.co.uk](http://www.vle.mathswatch.co.uk),  
[www.mymaths.co.uk](http://www.mymaths.co.uk),

[www.mathsgenie.co.uk](http://www.mathsgenie.co.uk),

[www.corbettmaths.co.uk](http://www.corbettmaths.co.uk),

<http://www.counton.org/resources/ks3framework/pdfs/vocabulary.pdf> (vocabulary list)