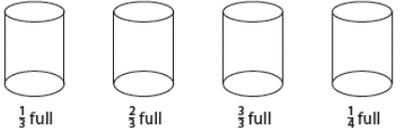
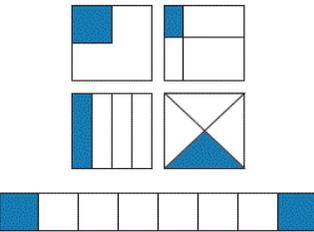


Unit Overview and Guidance

- The exemplification has been taken from the NCETM online 'Resource Toolkit', with additions in order to ensure full coverage.
- Links to the White Rose Maths hubs schemes of work (with questions categorised into the three aims of the national curriculum i.e. fluency, problem solving and reasoning) are hyperlinked to each of the objectives. Many thanks go to the White Rose Maths hub for permission to include their resources.
- The NCETM reasoning questions have also been incorporated into each unit and are identified in pale purple boxes underneath the group of the most relevant objectives.
- The 'big Ideas' sections from the NCETM 'Teaching for Mastery' documents have been included at the start of each unit. Hyperlinks to the full NCETM 'Teaching for Mastery' documents have also been included for easy reference.
- Hyperlinks to NRich activities have also been added to this version. These are found by clicking on the blue buttons like this one 1 at the bottom of relevant objective.
- Some additional content has been added in order to support mixed-aged planning. Any additional content is in *italics*. Occasionally ~~strike through~~ has been used to identify when an objective has been altered and this is primarily where an objective has been split between two units.
- Each unit is sub-divided into sections for ease of planning. Sub-categories in this unit are;
 1. Recognising and Finding Fractions
 2. Decimals
 3. Finding and Using Equivalence
 4. Calculating with Fractions, Decimals and Percentages
 5. Solving Problems

	Yr 2	Yr 3	Yr 4
NCETM Teaching for Mastery Questions, tasks and activities to support assessment	<p>The Big Ideas</p> <p>Fractions involve a relationship between a whole and parts of a whole. Ensure children express this relationship when talking about fractions. For example, 'If the bag of 12 sweets is the whole, then 4 sweets are one third of the whole.'</p> <p>Partitioning or 'fair share' problems when each share is less than one gives rise to fractions.</p> <p>Measuring where the unit is longer than the item being measured gives rise to fractions.</p>	<p>The Big Ideas</p> <p>Fractions are equal parts of a whole.</p> <p>Equal parts of shapes do not need to be congruent but need to be equal in area.</p> <p>Decimal fractions are linked to other fractions.</p> <p>The number line is a useful representation that helps children to think about fractions as numbers.</p>	<p>The Big Ideas</p> <p>Fractions arise from solving problems, where the answer lies between two whole numbers.</p> <p>Fractions express a relationship between a whole and equal parts of a whole. Children should recognise this and speak in full sentences when answering a question involving fractions. For example, in response to the question What fraction of the chocolate bar is shaded? the pupil might say Two sevenths of the whole chocolate bar is shaded.</p> <p>Equivalency in relation to fractions is important. Fractions that look very different in their symbolic notation can mean the same thing.</p>
	Teaching for Mastery Year 2	Teaching for Mastery Year 3	Teaching for Mastery Year 4

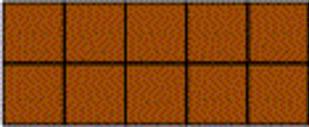
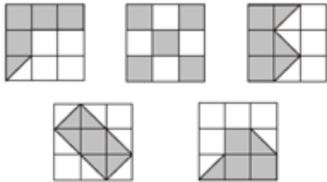
NUMBER: Fractions, Decimals and Percentages (NFD - 7 weeks)

Strand	Yr2	Yr3	Yr4
Recognising and Finding Fractions Recognise fractions	<p>recognise, find, name and write fractions $\frac{1}{3}, \frac{1}{4}, \frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity</p> <p>Equal parts</p> <p>Recognise a half</p> <p>Recognise a quarter</p> <p>Recognise a third</p> <p>Unit fractions</p> <p>Non-unit fractions</p> <p>Count in fractions</p> <p>Shade the cylinders.</p>  <p>$\frac{1}{3}$ full $\frac{2}{3}$ full $\frac{3}{3}$ full $\frac{1}{4}$ full</p> <p><i>This may first be carried out as a practical activity.</i></p> <p>Harrison and Sam were talking and Harrison said that if he doubled Sam's age and added 2 he would get 12.</p> <p>Which of these diagrams have $\frac{1}{4}$ of the whole shaded?</p>  <p>Explain your reasoning</p> <p>Jayne says that the shaded part of the whole square does not show a half because there are three pieces, not two.</p>  <p>Do you agree? Explain your reasoning.</p>	<p>unit fractions and non-unit fractions with small denominators</p> <p>Unit and non-unit fractions</p> <p>Tenths</p> <p>Unit Fractions. Unit means one. Here are some examples of unit fractions.</p>  <p>$\frac{1}{3}$ one tenth a fifth a half $\frac{1}{2}$</p> <p>Non-unit fractions. Unit means one, so non-unit is any number apart from one. Here are some examples of non-unit fractions.</p>  <p>$\frac{2}{3}$ three fifths two quarters $\frac{5}{8}$ $\frac{5}{6}$</p> <p>Many (or, rather, more than one of the) parts, of an equally divided whole, is a non-unit fraction.</p> <p>What fraction of this shape is shaded? How do you know?</p> 	<p>(Year 3 objective) unit fractions and non-unit fractions with small denominators</p> <p>Year 4 What is a fraction?</p>
	1		

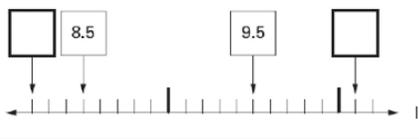
NUMBER: Fractions, Decimals and Percentages (NFD - 7 weeks)

Decimals	Count, Compare and Order Decimals	count up and down in tenths	count up and down in hundredths
	<p>Spot the mistake... and correct it</p> <p>7, $7\frac{1}{2}$, 8, 9, 10</p> <p>$8\frac{1}{2}$, 8, 7, $6\frac{1}{2}$,</p> <p>What comes next?</p> <p>$5\frac{1}{2}$, $6\frac{1}{2}$, $7\frac{1}{2}$,,</p> <p>$9\frac{1}{2}$, 9, $8\frac{1}{2}$,,</p>	<p>Spot the mistake</p> <p>six tenths, seven tenths, eight tenths, nine tenths, eleven tenths ... and correct it.</p>	<p>Spot the mistake</p> <p>sixty tenths, seventy tenths, eighty tenths, ninety tenths, twenty tenths ... and correct it.</p> <p>Missing symbol</p> <p>Put the correct symbol < or > in each box</p> <p>3.03 <input type="checkbox"/> 3.33</p> <p>0.37 <input type="checkbox"/> 0.32</p> <p>What needs to be added to 3.23 to give 3.53?</p> <p>What needs to be added to 3.16 to give 3.2?</p>

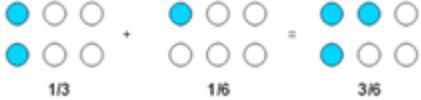
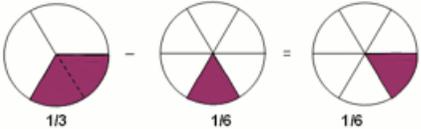
NUMBER: Fractions, Decimals and Percentages (NFD - 7 weeks)

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Finding and Using Equivalence</p>	<p>recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$</p> <p><u>Equivalence of $\frac{2}{4}$ and $\frac{1}{2}$</u></p>  <p>Would a chocolate lover rather have $\frac{1}{2}$ or $\frac{2}{4}$ of this bar of chocolate?</p> <p>Explain your answer.</p>	<p>recognise and show, using diagrams, equivalent fractions with small denominators</p> <p><u>Equivalent fractions (1)</u></p> <p><u>Equivalent fractions (2)</u></p> <p><u>Equivalent fractions (3)</u></p> <p>Children should be able to:</p> <ul style="list-style-type: none"> Identify pairs of fractions that total 1. Circle two fractions that have the same value <p>compare and order unit fractions, and fractions with the same denominator</p> <p><u>Compare fractions</u></p> <p><u>Order fractions</u></p> <p>Children should be able to answer questions like:</p> <p>Would you rather have $\frac{1}{3}$ of 30 sweets or $\frac{1}{5}$ of 40 sweets? Why?</p>	<p>recognise and show, using diagrams, families of common equivalent fractions</p> <p><u>Equivalent fractions (1)</u></p> <p><u>Equivalent fractions (2)</u></p> <p>Recognise that five tenths ($\frac{5}{10}$) or one half of this diagram is shaded.</p>  <p>Recognise that two eighths ($\frac{2}{8}$) or one quarter ($\frac{1}{4}$) of the set of buttons is ringed</p>  <p>Recognise that one whole is equivalent to two halves, three thirds, four quarters...</p> <p>For example, build a fraction 'wall' using a computer program and then estimate parts.</p> <p>Recognise patterns in equivalent fractions -</p> <p>$\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8} = \frac{5}{10}$ and similar patterns for -</p> <p>$\frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{6}, \frac{1}{10}$</p> <p>Here are five diagrams. Look at each one.</p> <p>Put a tick (✓) on the diagram is exactly $\frac{1}{2}$ of it is shaded. Put a cross (X) if it is not.</p> 
	<p>Equivalent Fractions</p>		
			<p style="text-align: right;">1 2 3</p>

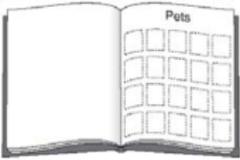
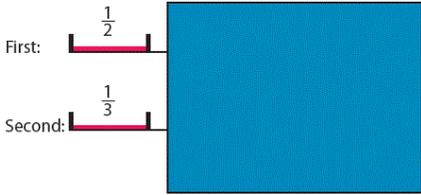
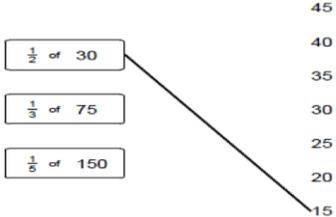
NUMBER: Fractions, Decimals and Percentages (NFD - 7 weeks)

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Finding and Using Equivalence</p>	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Fractions and Decimals</p>	<p>recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10</p> <p>Tenths as decimals</p> <p>Children should be able to:</p> <ul style="list-style-type: none"> • Use decimal notation for tenths • Divide single digits or whole numbers by 10 • Explain how finding $1/10$ is the same as dividing by 10 <p>Here is part of a number line. Write in the numbers missing from the two empty boxes.</p> 	<p>recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten</p> <p>recognise and write decimal equivalents of any number of tenths or hundredths</p> <p>Tenths and hundredths</p> <p>Tenths as decimals</p> <p>Tenths on a place value grid</p> <p>Hundredths</p> <p>Hundredths as decimals</p> <p>Hundredths on a place value grid</p> <p>Make a whole</p> <p>Write decimals</p> <p>What does the digit 6 in 3.64 represent? The 4?</p> <p>What is the 4 worth in the number 7.45? The 5?</p> <p>Suggest a decimal fraction between 4.1 and 4.2</p> <p>Know how many 10 pence pieces equal £1, how many 1 pence pieces equal £1, how many centimetres make a metre.</p> <p>Recognise 0.07 is equivalent to $\frac{7}{100}$ and 6.35 is equivalent to $6\frac{35}{100}$ etc</p> <p>Which of these decimals is equal to $\frac{19}{100}$? 1.9 10.19 0.19 19.1</p> <p>Write each of these as a decimal fraction: $\frac{27}{100}$ $\frac{3}{100}$ $2\frac{33}{100}$</p> <p>Write the decimal fraction equivalent to: two tenths and five hundredths; twenty-nine hundredths; fifteen and nine hundredths.</p> <p>recognise and write decimal equivalents to $\frac{1}{4}$; $\frac{1}{2}$; $\frac{3}{4}$</p> <p>Halves and quarters</p> <p>0.5 is equivalent to $\frac{1}{2}$, 0.25 is equivalent to $\frac{1}{4}$, 0.75 is equivalent to $\frac{3}{4}$, 0.1 is equivalent to $\frac{1}{10}$</p> <p>Particularly in the context of money and measurement.</p> <p>Write the decimal fraction equivalent to: two tenths and five hundredths; twenty-nine hundredths; fifteen and nine hundredths</p>

NUMBER: Fractions, Decimals and Percentages (NFD - 7 weeks)

Finding and Using Equivalence	NCETM Reasoning	<p>Odd one out. Which is the odd one out in this trio: $\frac{1}{2}$ $\frac{2}{4}$ $\frac{1}{4}$</p> <p>Why?</p> <p>What do you notice?</p> <p>Find $\frac{1}{2}$ of 8, Find $\frac{2}{4}$ of 8. What do you notice?</p>	<p>Odd one out.</p> <p>Which is the odd one out in each of these trios?</p> <p>$\frac{1}{2}$ $\frac{3}{6}$ $\frac{5}{8}$</p> <p>$\frac{3}{9}$ $\frac{2}{6}$ $\frac{4}{9}$</p> <p>Why?</p>	<p>Odd one out.</p> <p>Which is the odd one out in each of these trio?</p> <p>$s\frac{3}{4}$ $\frac{9}{12}$ $\frac{4}{6}$</p> <p>$\frac{9}{12}$ $\frac{10}{15}$ $\frac{2}{3}$</p> <p>Why?</p> <p>Complete the pattern by filling in the blank cells in this table:</p> <table border="1"> <tr> <td>$\frac{1}{10}$</td> <td>$\frac{2}{10}$</td> <td>$\frac{3}{10}$</td> <td></td> </tr> <tr> <td>$\frac{10}{100}$</td> <td>$\frac{20}{100}$</td> <td></td> <td>$\frac{40}{100}$</td> </tr> <tr> <td>0.1</td> <td></td> <td>0.3</td> <td></td> </tr> </table> <p>Another and another</p> <p>Write a decimal numbers (to one decimal place) which lies between a half and three quarters?</p> <p>... and another, ... and another, ...</p> <p>Ordering</p> <p>Put these numbers in the correct order, starting with the smallest.</p> <ul style="list-style-type: none"> $\frac{1}{4}$ 0.75 $\frac{5}{10}$ $\frac{4}{8}$ $\frac{3}{4}$ $\frac{1}{4}$ 	$\frac{1}{10}$	$\frac{2}{10}$	$\frac{3}{10}$		$\frac{10}{100}$	$\frac{20}{100}$		$\frac{40}{100}$	0.1		0.3	
		$\frac{1}{10}$	$\frac{2}{10}$	$\frac{3}{10}$												
$\frac{10}{100}$	$\frac{20}{100}$		$\frac{40}{100}$													
0.1		0.3														
Calculating with Fractions	Adding and Subtracting Fractions	<p>add/subtract fractions with the same denominator within one whole (e.g. $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$)</p> <p>Making the whole</p> <p>Add fractions</p> <p>Subtract fractions</p> <p>For addition:</p>  <p>and for subtraction:</p> 	<p>add and subtract fractions with the same denominator</p> <p>Add 2 or more fractions</p> <p>Subtract 2 fractions</p> <p>Subtract from whole amounts</p> <p>For example:</p> <p>$\frac{1}{2} + \frac{1}{2}$ $\frac{1}{4} + \frac{3}{4}$ $\frac{3}{8} + \frac{5}{8}$ $\frac{3}{5} + \frac{4}{5} + \frac{1}{5}$</p> <p>$\frac{6}{7} - \frac{4}{7}$ $\frac{9}{10} + \frac{4}{10} - \frac{3}{10}$</p>	<p>add and subtract fractions with the same denominator</p> <p>Add 2 or more fractions</p> <p>Subtract 2 fractions</p> <p>Subtract from whole amounts</p> <p>For example:</p> <p>$\frac{1}{2} + \frac{1}{2}$ $\frac{1}{4} + \frac{3}{4}$ $\frac{3}{8} + \frac{5}{8}$ $\frac{3}{5} + \frac{4}{5} + \frac{1}{5}$</p> <p>$\frac{6}{7} - \frac{4}{7}$ $\frac{9}{10} + \frac{4}{10} - \frac{3}{10}$</p>												

NUMBER: Fractions, Decimals and Percentages (NFD - 7 weeks)

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Calculating with Fractions</p>	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">NCEM Reasoning</p>	<p>What do you notice?</p> $1/10 + 9/10 = 1$ $2/10 + 8/10 = 1$ $3/10 + 7/10 = 1$ <p>Continue the pattern</p> <p>Can you make up a similar pattern for eighths?</p> <p>The answer is $5/10$, what is the question? (involving fractions / operations)</p>	<p>What do you notice?</p> $5/5 - 1/5 = 4/5$ $4/5 - 1/5 = 3/5$ <p>Continue the pattern</p> <p>Can you make up a similar pattern for addition?</p> <p>The answer is $3/5$, what is the question?</p> <p>What do you notice?</p> $11/100 + 89/100 = 1, 12/100 + 88/100 = 1, 13/100 + 87/100 = 1$ <p>Continue the pattern for the next five number sentences</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Solving Problems</p>	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Solving Problems</p>	<p>solve problems that involve all of the above</p> <p>Children should be able to answer questions like</p> <ul style="list-style-type: none"> 15 grapes are shared equally onto five plates. What fraction of the grapes is on each plate? <p>Megan has 20 animal stickers to go on this page –</p>  <p>1/4 of them are dog stickers 1/2 of them are cat stickers The rest are rabbit stickers</p> <p>How many rabbit stickers does she have?</p> <p>Only a fraction of each ribbon is shown. The rest is hidden behind the sheet of paper –</p>  <p>Which ribbon is longer? Explain your reasoning.</p>	<p>solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number</p> <p>What is one-fifth of twenty-five?</p> <p>Write the missing number to make this correct.</p> $\frac{1}{4} \text{ of } 24 = \frac{1}{2} \text{ of } \square$  <p>Match each box to the correct number.</p>