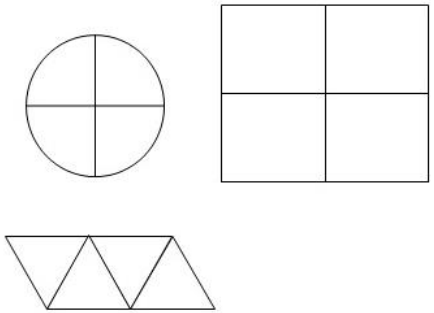
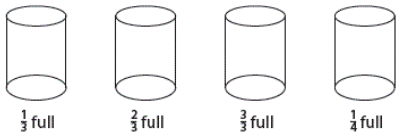
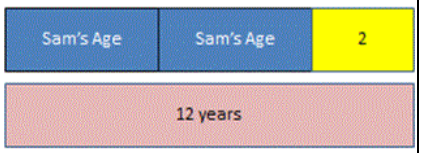
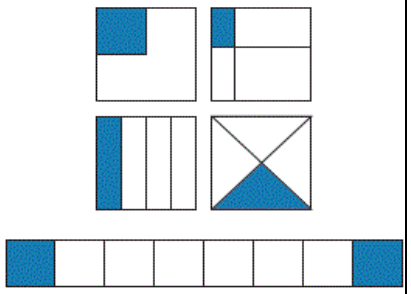
Unit Overview and Guidance

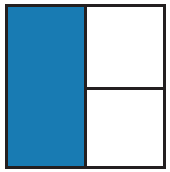
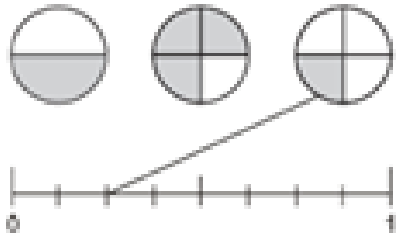
- The exemplification has been taken from the NCETM online 'Resource Toolkit', with additions in order to ensure full coverage.
- Links to the White Rose Maths hubs schemes of work (with questions categorised into the three aims of the national curriculum i.e. fluency, problem solving and reasoning) 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 ~~strikethrough~~ 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

	Reception	Yr 1	Yr 2	Yr 3
NCETM Teaching for Mastery Questions, tasks and activities to support assessment	**The Big Ideas** *Numbers (Early Learning goals)* They solve problems, including doubling, halving and sharing.	**The Big Ideas** Fractions express a relationship between a whole and equal parts of the whole. Ensure children express this relationship when talking about fractions. For example, 'If the circle (where the circle is divided into four equal parts with one part shaded) is the whole, one part is one quarter of the whole circle.' Halving involves partitioning an object, shape or quantity into two equal parts. The two parts need to be equivalent in, for example, area, mass or quantity.	**The Big Ideas** 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.' Partitioning or 'fair share' problems when each share is less than one gives rise to fractions. Measuring where the unit is longer than the item being measured gives rise to fractions.	**The Big Ideas** Fractions are equal parts of a whole. Equal parts of shapes do not need to be congruent but need to be equal in area. Decimal fractions are linked to other fractions. The number line is a useful representation that helps children to think about fractions as numbers.
	Becoming a Mathematician	Teaching for Mastery Year 1	Teaching for Mastery Year 2	Teaching for Mastery Year 3

NUMBER: Fractions, Decimals and Percentages (NFD - 4 weeks)

Strand		Reception	Yr1	Yr2	Yr3
Recognising and Finding Fractions	Recognise and find fractions	***ELG*** *They solve problems, including doubling, halving and sharing.* ***Adult Initiated*** **Find half using objects**; *How many apples are in the box? Take half of them out. How many did you take out? How many are left?* **Cut the cake in half.** *How many pieces do you have now? Are the pieces the same size? How can we check? If we cut two cakes in half how many pieces will we have? Let's check.* **Butterfly symmetry** ***Enabling Environments –child initiated, adult supported*** **Indoors** **Small world:** putting half of: the sheep in the field… the cars in the garage… the dinosaurs in the forest… the play people in the house… the animals in the ark… **Malleable area:** making a cake, pizza etc.- cutting it into half . *How many pieces are there? Can you share the 6 buns/ sausage rolls you have made between 2 or 3 children? How many will they each get?*	**recognise, find and name a half as one of two equal parts of an object, shape or quantity** Shade one half of each shape. Can you find different ways to do this?  Here is a set of pencils. How many is half of the set?  1	**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** Shade the cylinders.  *This may first be carried out as a practical activity.* Using bar models to represent and unpick a fraction word problem  Harrison and Sam were talking and Harrison said that if he doubled Sam's age and added 2 he would get 12. Which of these diagrams have ¼ of the whole shaded?  Explain your reasoning	**(Y3 objective) recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators** Children should be able to recognise and write unit and non-unit fractions of shapes. **Unit Fractions.** Unit means one. Here are some examples of unit fractions.  **Non-unit fractions.** Unit means one, so non-unit is any number apart from one. Here are some examples of non-unit fractions.  Many (or, rather, more than one of the) parts, of an equally divided whole, is a non-unit fraction. Understand that the number on the bottom of a fraction tells me how many pieces the whole is divided into What fraction of this shape is shaded?  How do you know? Is there another way that you can describe the fraction?

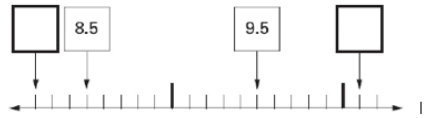
NUMBER: Fractions, Decimals and Percentages (NFD - 4 weeks)

Recognising and Finding Fractions	Recognise and find fractions		**recognise, find and name a quarter as one of four equal parts of an object, shape or quantity** Four children share 12 strawberries into equal parts. How many strawberries will each child get?  Colour half of each whole shape:  *Check that pupils do not think that just dividing a shape into any two pieces is halving but understand that they need to be equal pieces.* 1	Jayne says that the shaded part of the whole square below does not show a hallf because there are three pieces, not two. Do you agree? Explain your reasoning  1 **write simple fractions for example, ½ of 6 = 3**	• Here are 21 apples. • Put a ring around one third of them.  *Find;* *One fifth of 60kg* *Two fifths of 50 litres* (On a number line marked from zero to 5). A fraction of each shape is shaded. Match each fraction to the correct place on the number line. One has been done for you. 1 **recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators** Position fractions on a number line; eg. mark fractions such as ½, 3 ½ and 2 3/10 A fraction of each shape is shaded. Match each fraction to  the correct place on the number line. One has been done for you. 1

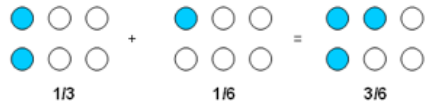
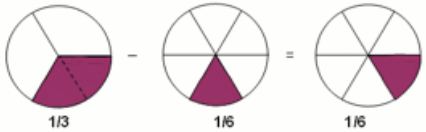
NUMBER: Fractions, Decimals and Percentages (NFD - 4 weeks)

Recognising and Finding Fractions	NCETM Reasoning		**What do you notice?** Choose a number of counters. Place them onto 2 plates so that there is the same number on each half. When can you do this and when can't you? What do you notice? **True or false?** Sharing 8 apples between 4 children means each child has 1 apple.	**What do you notice?** ¼ of 4 = 1 ¼ of 8 = 2 ¼ of 12 = 3 Continue the pattern What do you notice? **True or false?** Half of 20cm = 5cm ¾ of 12cm = 9cm **Ordering** Put these fractions in the correct order, starting with the smallest. ½ ¼ 1/3	**What comes next?** 6/10, 7/10, 8/10, ….., …. 12/10, 11/10, ….., ….., ….. **True or false?** 2/10 of 20cm = 2cm 4/10 of 40cm = 4cm 3/5 of 20cm = 12cm **Give an example** of a fraction that is less than a half. Now another example that no one else will think of. Explain how you know the fraction is less than a half. (draw an image) **Put in Order** Ben put these fractions in order starting with the smallest. Are they in the correct order? One fifth, one seventh, one sixth **What do you notice?** 1/10 of 10 = 1 2/10 of 10 = 2 3/10 of 10 = 3 Continue the pattern. What do you notice? What about 1/10 of 20? Use this to work out 2/10 of 20, etc **What do you notice?** Find 2/5 of 10 Find 4/10 of 10. What do you notice? Can you write any other similar statements?

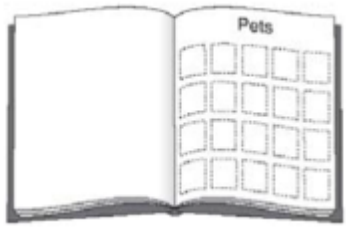
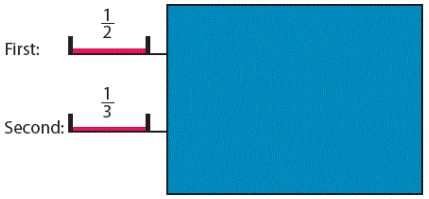
NUMBER: Fractions, Decimals and Percentages (NFD - 4 weeks)

Decimals	Counting with decimals				**count up and down in tenths;** **recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10** Children should be able to: • 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 Here is part of a number line. Write in the numbers missing from the two empty boxes. 
	NCETM Reasoning			**Spot the mistake**… and correct it 7, 7 ½ , 8, 9, 10 8 ½, 8, 7, 6 ½, **What comes next?** 5 ½, 6 ½ , 7 ½ , …., …. 9 ½, 9, 8 ½, ……, …..	**Spot the mistake** six tenths, seven tenths, eight tenths, nine tenths, eleven tenths … and correct it.
Finding and Using Equivalence	Equivalent Fractions			**recognise the equivalence of ²/₄ and ½**  Would a chocolate lover rather have ½ or ²/₄ of this bar of chocolate? Explain your answer.	**recognise and show, using diagrams, equivalent fractions with small denominators** Children should be able to: • Identify pairs of fractions that total 1. • Circle two fractions that have the same value.
	NCETM Reasoning			**Odd one out**. Which is the odd one out in this trio: ½ 2/4 ¼ Why? **What do you notice?** Find ½ of 8, Find 2/4 of 8. What do you notice?	**Odd one out**. Which is the odd one out in each of these trios? ½ 3/6 5/8 3/9 2/6 4/9 Why?

NUMBER: Fractions, Decimals and Percentages (NFD - 4 weeks)

Calculating with Fractions, Decimals and Percentages	Adding and Subtracting Fractions				**Add/subtract fractions with the same denominator within one whole (e.g. 5/7 + 1/7 = 6/7)** This could also be done by using drawings and in the array form: For addition:  and for subtraction: 
	NCETM Reasoning				**What do you notice?** 1/10 + 9/10 = 1 2/10 + 8/10 = 1 3/10 + 7/10 = 1 **Continue the pattern** Can you make up a similar pattern for eighths? The answer is 5/10, what is the question? (involving fractions / operations)

NUMBER: Fractions, Decimals and Percentages (NFD - 4 weeks)

Solving Problems	Solving Problems		**solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of a teacher** Find half of and double a number or quantity: 16 children went to the park at the weekend. Half that number went swimming. How many children went swimming? I think of a number and halve it. I end up with 9, what was my original number?		**solve problems that involve all of the above** 15 grapes are shared equally onto five plates. What fraction of the grapes is on each plate? Megan has 20 animal stickers to go on this page  1/4 of them are dog stickers 1/2 of them are cat stickers The rest are rabbit stickers How many rabbit stickers does she have? Only a fraction of each ribbon is shown. The rest is hidden behind the sheet of paper –  Which ribbon is longer? Explain your reasoning.	