

HET Fractions Policy



A document to support the teaching and learning of fractions in Years 1-6

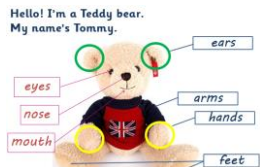
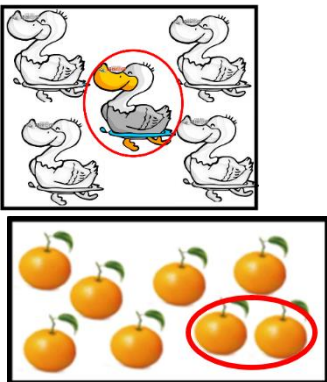
The relationship between part and whole

When beginning the teaching of fractions, each year group will teach the relationship between part and whole.

The progression of this concept across year groups will be evident by: the pace and confidence in which pupils can move between concrete, pictorial and abstract representations, reasoning depth and the complexity of examples used.

Sentence stem: If _____ is the **whole**, then _____ is a **part** of the whole.

Conclusion: A whole can be divided into many parts. Many parts can make one whole.

Exploring part and whole	One object as the whole	One object as the whole	Several objects as one whole	Number in a range of contexts
Story The elephant story allows pupils to recognise the relationship between the whole and part for themselves.  Story message: The blind man cannot identify the object because he only touched a part of the elephant, not the whole.	Concrete Pupils can see and hold the object.  If <u>the teddy bear</u> is the whole, then <u>his nose</u> is a part of the whole.	Pictorial The object is a picture on the board or on a piece of paper.  If <u>the duck</u> is the whole, then <u>the beak</u> is a part of the whole.	group Pictorial The object is a picture on the board or on a piece of paper.  If <u>8 oranges</u> are the whole, then <u>two oranges</u> are a part of the whole.	Abstract The parts and wholes are represented by numbers and measures. $5 + 6 = 11$ part whole $30 - 10 = 20$ whole part whole 92 49 part part part part whole part If <u>30</u> is the whole, then <u>20</u> is a part of the whole.
Reasoning Who is correct? Explain how you know  	England can only be the whole. It cannot be the part. 	England can be the whole but it can also be the part.		

Y1 NC Objective: To be able to recognise, find and name a half as one of two equal parts of an object, shape or quantity

Small steps:

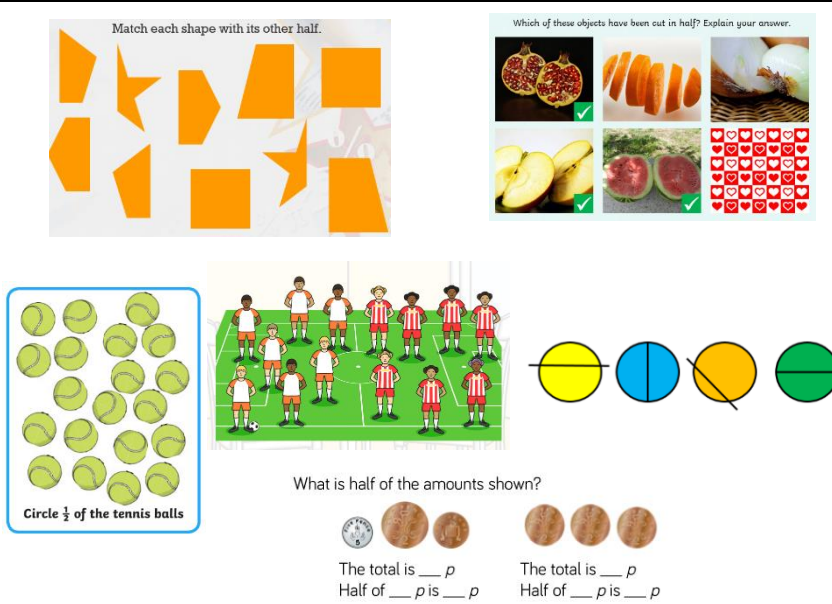
- Making halves of an object or shape
- Making halves of a quantity

Previous year group objective/s (FS):

- Help children understand one thing can be shared by a number of pieces e.g. pizza.
- Separate as a group of 3 or 4 objects in different ways and recognise that the total is the same

Next year group objective/s (Y2):

- Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$ of a shape/length/objects
- Write simple fractions for example $\frac{1}{2}$ of 6 = 3

Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)
My object is split into _____ equal parts. I know that _____ equal parts make 1 whole. I know _____ is a half because _____ I have _____ equal parts when an object is split in half	• Fraction • $\frac{1}{2}$ • Count • Shade • Represent • Find • Half • Whole • Complete • share • Shape • Equal • Non equal • Parts • Split • Object • Quantity • Amount • Total	When a shape is split into two equal parts one part is a $\frac{1}{2}$. Two halves are the same as one whole.	When a shape is split into two unequal parts it is not a half. When a quantity is shared into two equal parts one part is a half. It doesn't matter how a shape is split as long as both parts are equal (horizontal, vertical, diagonal split).	 The representations include: 1. A matching exercise where children pair identical shapes. 2. A grid of images where children identify which objects have been cut in half (e.g., pomegranate, carrots, watermelon, kiwi, strawberries). 3. A group of 12 tennis balls with a box indicating to circle half of them. 4. A soccer team of 12 players with a box indicating to circle half of them. 5. Four circles, each divided into two halves of different colors (yellow, blue, orange, green). 6. A question 'What is half of the amounts shown?' followed by two sets of coins: one set with 1p and 2p coins, and another set with 1p and 2p coins.

Y1 NC Objective: To be able to recognise, find and name a quarter as one of four equal parts of an object, shape or quantity <u>Small steps:</u> - Making quarters of an object or a shape - Making quarters of a quantity - Recognising halves and quarters as equal parts of the whole				Previous year group objective/s (FS): - Help children understand one thing can be shared by a number of pieces e.g. pizza. - Separate as a group of 3 or 4 objects in different ways and recognise that the total is the same Next year group objective/s (Y2): - Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$ of a shape/length/objects - Write simple fractions for example $\frac{1}{2}$ of $6 = 3$
Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)
My whole has ____ equal parts I can see ____ equal parts I can count ____ equal parts There are ____ cakes. There is ____ cake in each quarter, a quarter of ____ is ____	- Fraction $\frac{1}{2}$, $\frac{1}{4}$ - Count - Shade - Represent - Find - Half, quarter - Whole - Complete - Shape - Equal parts - Split - Object - Quantity - Amount - Total - Square - Circular - Rectangular - A quarter full - Same - Different	When a shape/object is split into four equal parts one part is a $\frac{1}{4}$ When an amount is shared into four equal parts one part is a $\frac{1}{4}$ Four quarters are equal to one whole. I know when finding a quarter full I split the container into 4 equal parts.	When a shape is split into four unequal parts it is not a quarter When a quantity is shared into four equal parts one part is a quarter. It doesn't matter how a shape is split as long as all parts are equal (horizontal, vertical, diagonal split).	Use the counters to complete the statement.  One quarter of 16 is ____. $\frac{1}{4}$ of 8 = $\frac{1}{4}$ of 20 = $\frac{1}{4}$ of 16 = $\frac{1}{4}$ of 12 = Complete the statement based on the picture  There are ____ boxes. One quarter of ____ is ____. Share each quantity into four equal groups. There are ____ cakes. There is ____ cake in each quarter. A quarter of ____ is ____  There are ____ sweets. There are ____ sweets in each quarter. A quarter of ____ is ____  There are ____ peaches. There are ____ peaches in each quarter. A quarter of ____ is ____  Find 3 different ways to split this object into 4 equal quarters.  Use counters to complete the sentences. A quarter of 4 is A quarter of 8 is 1 is one quarter of 3 is one quarter of

Y2 NC Objective: Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a shape.

Small steps:

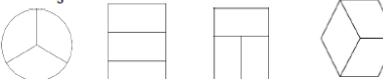
- Investigate and understand that fractions are equal parts of a whole.
- Investigating and recognising $\frac{1}{2}$ and $\frac{1}{4}$ as parts of a whole.
- Recognising and counting quarters up to 1 whole. Introduce the meaning of numerator and denominator.
- Identifying the numerator and denominator in different pictures of fractions (including $\frac{1}{2}$, $\frac{2}{2}$, $\frac{1}{3}$, $\frac{2}{3}$, $\frac{3}{3}$, $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, $\frac{4}{4}$).
- Finding the complements to make 1 whole e.g. $\frac{1}{3}$ plus another $\frac{2}{3}$ makes a whole.

Previous year group objective/s (Y1):

- Recognise, find and name a half as one of two equal parts of a shape
- Recognise, find and name a quarter as one of four equal parts of shape.

Next year group objective/s (Y3):

- Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a set of objects or quantity.

Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)
If _____ is the whole. _____ is part of the whole. There are _____ halves in one whole. There are _____ thirds in one whole. There are _____ quarters in one whole.	- Part / Whole $\frac{1}{2}$ $\frac{1}{4}$ - Equal parts - Unequal parts - Fraction - Fraction bar - Half - Quarter - Third - Two quarters - Three quarters - Numerator - Denominator - Part, part, whole - Square - Rectangle - Circle - Triangle	A whole can be divided into many equal parts. Many parts can make one whole. When we split a whole into two equal parts, one part is a half. When we split a whole into three equal parts, one part is a third. When we split a whole into four equal parts, one part is a quarter. The denominator is how many parts the whole is equally divided into. The numerator is how many parts of the whole are shaded in/I have.	A shape split into unequal parts to represent the fraction.	Look at the representations. Decide which show equal parts and which show unequal parts.  Which pictures represent $\frac{1}{2}$?  Circle the shapes that have a quarter shaded.  Shade $\frac{1}{3}$ of each shape.  What is the same? What is different? The whole pie is split into equal parts. Each part is worth a This is the same as  If the elephant is the whole...  the trunk is part of the whole. Your turn: If the _____ is the whole, the _____ is part of the whole.

Y2 NC Objective: Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a set of objects or quantity

Small steps:

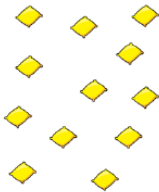
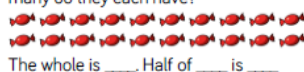
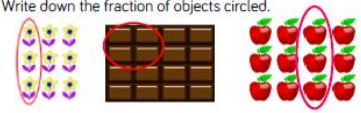
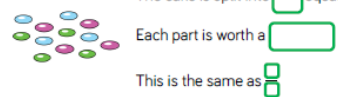
- Investigate and understand that fractions are equal parts of a whole.
- Investigating and recognising $\frac{1}{2}$ and $\frac{1}{4}$ as parts of a whole.
- Recognising and counting quarters up to 1 whole. Introduce the meaning of numerator and denominator.
- Identifying the numerator and denominator in different pictures of fractions (including $\frac{1}{2}$, $\frac{2}{2}$, $\frac{1}{3}$, $\frac{2}{3}$, $\frac{3}{3}$, $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, $\frac{4}{4}$).
- Finding the complements to make 1 whole e.g. $\frac{1}{3}$ plus another $\frac{2}{3}$ makes a whole.

Previous year group objectives (Y1):

- Recognise, find and name a half as one of two equal parts of a quantity or set of objects.
- Recognise, find and name a quarter as one of four equal parts of a quantity or set of objects.

Next year group objective/s (Y3):

- Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.

Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)
If _____ is the whole. _____ is part of the whole. There are _____ halves in one whole. There are _____ thirds in one whole. There are _____ quarters in one whole.	- Part / Whole $\frac{1}{2}$ $\frac{1}{4}$ - Equal parts - Unequal parts - Fraction - Fraction bar - Half - Quarter - Third - Two quarters - Three quarters - Numerator - Denominator - Part, part, whole - Quantity - Set - Objects - Items	A whole can be made up of many equal parts (display set of objects/map of the world etc). Many parts can make one whole. When we split a whole into two equal parts, one part is a half. When we split a whole into three equal parts, one part is a third. When we split a whole into four equal parts, one part is a quarter. The denominator is how many parts the whole is made up of (show set of objects) The numerator is how many parts of the whole I have (take some of the objects).	A set of objects/quantity split into unequal parts to represent the fraction.	Can you split the teddies into three equal groups? Can you split the teddies into three unequal groups?  How many different ways can you put these beanbags into equal groups?  James has 20 sweets. He gives half of them to his friend. How many do they each have? The whole is _____. Half of _____ is _____  Write down the fraction of objects circled.  Share the smarties equally between 4 people. The cake is split into equal parts. Each part is worth a This is the same as  If the elephant is the whole...  the trunk is part of the whole. Your turn: If the _____ is the whole, the _____ is part of the whole.

Y2 NC Objective: Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length.

Small steps:

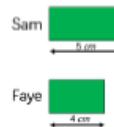
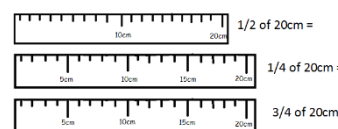
- Investigate and understand that fractions are equal parts of a whole.
- Investigating and recognising $\frac{1}{2}$ and $\frac{1}{4}$ as parts of a whole.
- Recognising and counting quarters up to 1 whole. Introduce the meaning of numerator and denominator.
- Identifying the numerator and denominator in different pictures of fractions (including $\frac{1}{2}$, $\frac{2}{2}$, $\frac{1}{3}$, $\frac{2}{3}$, $\frac{3}{3}$, $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, $\frac{4}{4}$).
- Finding the complements to make 1 whole e.g. $\frac{1}{3}$ plus another $\frac{2}{3}$ makes a whole.

Previous year group objective/s (Y1):

- Recognise, find and name a half as one of two equal parts of a length
- Recognise, find and name a quarter as one of four equal parts of a length

Next year group objective/s (Y3):

- Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.

Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)
If _____ is the whole. _____ is part of the whole. There are _____ halves in one whole. There are _____ thirds in one whole. There are _____ quarters in one whole.	- Part / Whole $\frac{1}{2}$ $\frac{1}{4}$ - Equal parts - Unequal parts - Fraction - Fraction bar - Half - Quarter - Third - Two quarters - Three quarters - Numerator - Denominator - Part, part, whole - Length - Ribbon - Centimetres - Millimetres - Piece	A whole can be divided into many equal parts. Many parts can make one whole. When we split a whole into two equal parts, one part is a half. When we split a whole into three equal parts, one part is a third. When we split a whole into four equal parts, one part is a quarter. The denominator is how many parts the whole is equally divided into. The numerator is how many parts of the whole are shaded in/I have.	A length split into unequal parts to represent the fraction.	Sam and Faye each have a piece of ribbon that they have cut into quarters.  How long was Sam's whole piece of ribbon? How long was Faye's whole piece of ribbon? Whose whole piece of ribbon was the longest?  If the elephant is the whole...  the trunk is part of the whole. Your turn: If the _____ is the whole, the _____ is part of the whole. Shania, Leo and Alby each have a piece of ribbon. Shania has $\frac{1}{2}$  Leo has $\frac{1}{4}$  Alby has $\frac{1}{8}$  Who will have the longest piece? Who will have the shortest piece? Explain why.

Y2 NC Objective: Recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$.

Small steps:

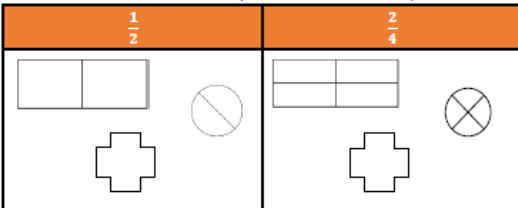
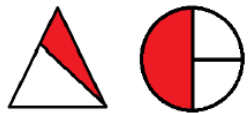
- Recognising and equivalence of $\frac{2}{2}$, $\frac{3}{3}$ and $\frac{4}{4}$.
- Recognising and investigating the equivalence of $\frac{1}{2}$ and $\frac{2}{4}$.

Previous year group objective/s (Y1):

- Recognise, find and name a half as one of two equal parts of an object, shape or quantity.

Next year group objective/s (Y3):

- Recognise and show, using diagrams, equivalent fractions with small denominators.

Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)
There are ____ halves in one whole. There are ____ quarters in one whole. There are ____ quarters in one half. ____ halves make one whole. ____ quarters make one whole. ____ quarters make one half.	• Part • Whole • $\frac{1}{2}$ • $\frac{1}{4}$ • $\frac{2}{4}$ • Equal parts • Unequal parts • Fraction • Fraction bar • Half • Quarter • Two quarters • Numerator • Denominator • Part, part, whole • Equal • Equivalent • Equivalence	A whole can be divided into many equal parts. Many parts can make one whole. When we split a whole into two equal parts, one part is a half. When we split a whole into four equal parts, one part is a quarter. When we split a whole into four equal parts, two parts are the same as a half. The denominator is how many parts the whole is equally divided into. The numerator is how many parts of the whole are shaded in/I have.	A shape split into unequal parts to represent the fraction of $\frac{1}{2}$ and $\frac{2}{4}$. A set of objects/quantity split into unequal parts to represent the fraction of $\frac{1}{2}$ and $\frac{2}{4}$.	Using two identical strips of paper, explore what happens when you fold the strips into two equal pieces and four equal pieces. Compare one of the two equal pieces with two of the four equal pieces.  What do you notice? Give children an amount of counters or concrete objects, can you find one half of them? Can you find two quarters of them? What do you notice? Shade in one half and two quarters of each shape.  Tick the shapes below that show either $\frac{1}{2}$ or $\frac{2}{4}$  George has a jar of 12 cookies. He gives half of them to Sam, and $\frac{2}{4}$ of them to Ben.  Who gets the most cookies? Explain how you know.

Y2 NC Objective: Write simple fractions for example $\frac{1}{2}$ of 6 = 3.

Small steps:

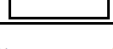
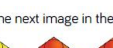
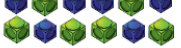
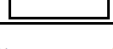
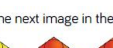
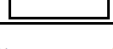
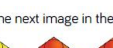
- Comparing the value of fractions with the same denominator but different numerators.
- Comparing and ordering fractions with different denominators using images.
- Counting in halves/quarters/thirds over the value of 1 (counting wholes and parts).
- Finding half/third/quarter of a quantity.
- Sharing 1 whole between 2, 3 or 4 then moving on to sharing multiple objects to represent "the whole," between 2, 3 or 4.

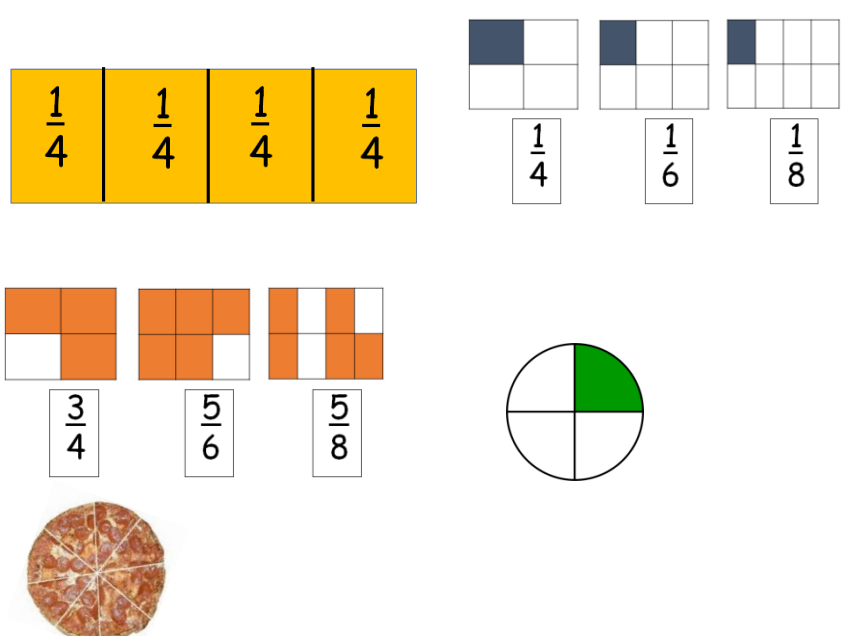
Previous year group objective/s (Y1):

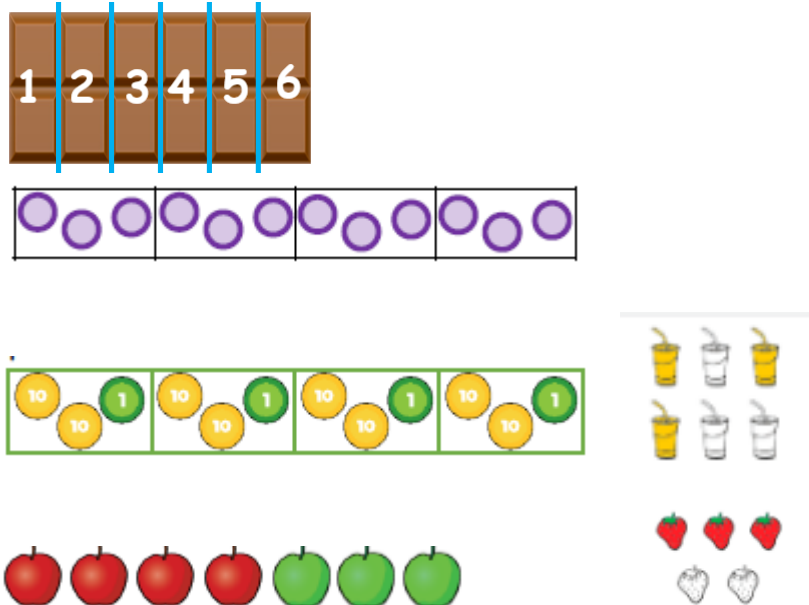
- Recognise, find and name a half as one of two equal parts of an object, shape or quantity.

Next year group objective/s (Y3):

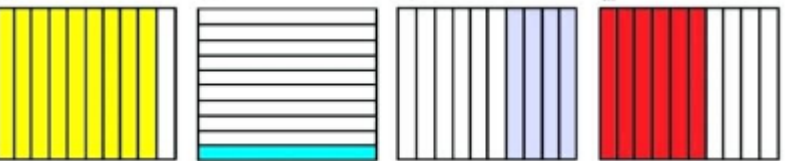
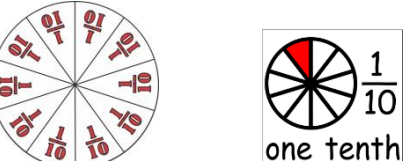
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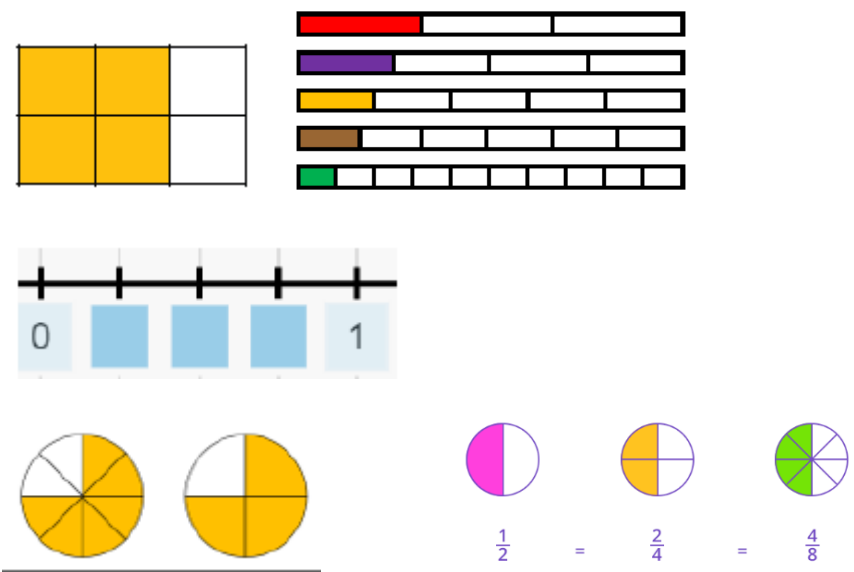
Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)																											
If _____ is the whole. _____ is part of the whole. There are _____ halves in one whole. There are _____ thirds in one whole. There are _____ quarters in one whole. When the numerator and denominator are the _____, the fraction represents one whole.	• Part • Whole • $\frac{1}{2}$ • $\frac{1}{4}$ • Equal parts • Unequal parts • Fraction • Fraction bar • Half • Quarter • Third • Three quarters • Numerator • Denominator • Part, whole • Quantity • Amount • Objects	When we split a whole into two equal parts, one part is a half. When we split a whole into three equal parts, one part is a third. When we split a whole into four equal parts, one part is a quarter. The denominator is how many parts the whole is equally divided into. The numerator is how many parts of the whole are shaded in. Unit fractions always have a numerator of 1. Non-unit fractions have a numerator worth more than 1. When the numerator and denominator are the same number, the fraction represents one whole.	Children do not recognise when counting in fractions $2/2$, $3/3$, $4/4$ can also be said as 'one whole'. When finding $\frac{1}{2}$, $1/3$, $\frac{1}{4}$ children do not recognise each group needs to be made of equal parts.	Complete the missing information. <table><tr><th>Fraction</th><th>Bar Model</th><th>Words</th></tr><tr><td>$\frac{1}{2}$</td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td>One quarter</td></tr></table> Complete the table. <table><tr><th>Fraction</th><th>Bar Model</th><th>Words</th></tr><tr><td>$\frac{1}{4}$</td><td></td><td>One quarter</td></tr><tr><td></td><td></td><td></td></tr><tr><td>$\frac{3}{4}$</td><td></td><td></td></tr><tr><td></td><td></td><td>One whole</td></tr></table> Fill in the blanks. Use counters to help you if needed. $\frac{1}{2}$ of 10 = $\frac{1}{2}$ of = 10 $\frac{1}{2}$ of 12 = $\frac{1}{2}$ of = 12 $\frac{1}{2}$ of 14 = $\frac{1}{2}$ of = 14 What do you notice? Circle one quarter of the cars.  One quarter of _____ is _____ _____ is $\frac{1}{4}$ of _____ Use the cubes to make three equal groups.  There are cubes altogether. One third of is of is What would the next image in the sequence look like?  What do you notice about the fraction of yellow cubes? Can you count the fractions represented?	Fraction	Bar Model	Words	$\frac{1}{2}$								One quarter	Fraction	Bar Model	Words	$\frac{1}{4}$		One quarter				$\frac{3}{4}$					One whole
Fraction	Bar Model	Words																													
$\frac{1}{2}$																															
																															
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Y3 NC Objective: Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators. (WRMH Spring Block 5 2018) <u>Small steps:</u> - Investigating different parts and wholes. - Fractions as equal parts of a whole. - Recognising and writing unit fractions using the fraction bar. - Recognising and writing non-unit fractions using the fraction bar.				Previous year group objective/s (Y2): 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.
				Next year group objective/s (Y4): 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.
Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)
If _____ is the whole, then _____ is part of the whole. There are _____ equal parts. The fraction shown is _____.	Whole Part Numerator Denominator Fraction bar Fraction Representation Equal Half Third Quarter Fifth Unit fraction Non-unit fraction	A whole can be divided into many parts. Many parts can make a whole. When we have a fraction the parts are equal sizes.	Thinking that just splitting into 2 parts makes $\frac{1}{2}$; the parts MUST be the same size. Halves can be different sizes IF the wholes are different sizes (Eg. Half of a large cake would look different to half of a small biscuit but they would both be one half.)	

Y3 NC Objective: Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators. (WRMH Spring Block 5 2018) <u>Small steps:</u> - Find $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{3}$ of objects. - Find $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{3}$ of amounts. - Finding non unit fractions of amounts. ($\frac{2}{4}$, $\frac{3}{4}$, $\frac{2}{3}$) - Compare the relative size of non-unit fractions. - Compare the relative size of non-unit fractions of amounts - Begin to understand that the fraction line represents division.				Previous year group objective/s (Y2): - 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. - Write simple fractions for example, $\frac{1}{2}$ of 6 = 3 Next year group objective/s (Y4): - 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.
Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)
The whole is _____. There are _____ equal parts in the whole. We are finding _____ equal parts of the whole.	Whole Part Numerator Denominator Fraction bar Fraction Representation Equal Half Third Quarter Fifth Sixth Unit fraction Non-unit fraction	The denominator tells us how many equal parts a whole has been split into The numerator tells us how many equal parts of the whole there are. The parts must be equal.	A shape split into unequal parts is not a fraction. A set of objects/quantity split into unequal parts will not represent a fraction.	

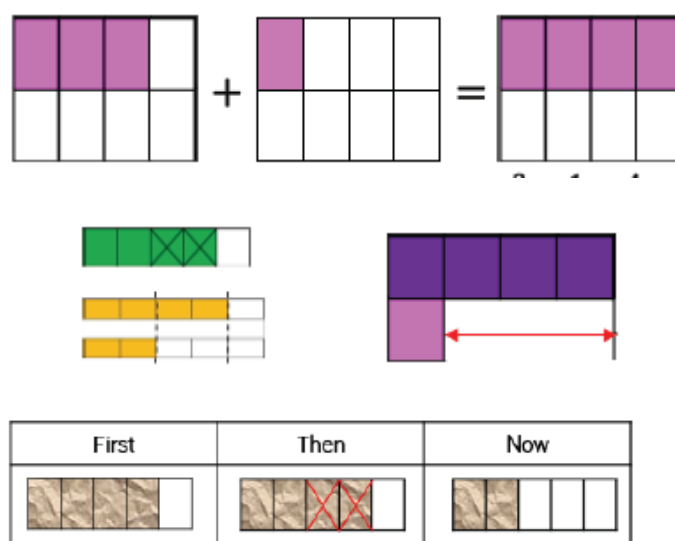
Y3 NC Objective: Recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10. (WRMH Spring Block 5 2018) Small steps: - Identify and find 1/10 of an object by dividing it into 10 equal parts. - Identify non unit fraction tenths of objects. - Identify non unit fraction tenths of amounts. - Find the complement of tenths to make				Previous year group objective/s (Y2): - Recognise, find, name and write fractions (1/3, 1/4, 2/4) and 3/4 of a length, shape, set of objects or quantity. - Write simple fractions for example, 1/2 of 6 = 3 Next year group objective/s (Y4): - Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.						
Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)						
There are ____ equal parts in the whole. ____ equal parts are shaded.	Whole Part Numerator Denominator Fraction bar Fraction Representation Equal Divide Tenth	When one is divided into ten equal parts, each part is a tenth.	It doesn't matter how the parts are shaded. It doesn't matter if it is a column or row on the 100 square. If the 10 parts are not equal, then each part is not a tenth.	1 <table><tr><th>Image</th><th>Words</th><th>Fraction</th></tr><tr><td> 0.1 </td><td>One tenth</td><td>$\frac{1}{10}$</td></tr></table> Three tenths $\frac{3}{10}$	Image	Words	Fraction	0.1	One tenth	$\frac{1}{10}$
Image	Words	Fraction								
0.1	One tenth	$\frac{1}{10}$								

Y3 NC Objective: Count up and down in tenths. WRMH Spring Block 5 2018)				Previous year group objective/s (Y2):
<u>Small steps:</u> - Count up in tenths - Count back in tenths				NEW LEARNING
				Next year group objective/s (Y4):
				Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.
Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)
1/10, 2/10, 3/10 ... The next tenth is ____. The tenth before ____ is ____. There are ____ tenths in one whole.	Whole Part Numerator Denominator Fraction bar Fraction Representation Equal Tenth Forwards backwards	When we count in tenths, the denominator is always 10. When we count forwards /backwards in tenths, the numerator increases/ decreased by 1 each time.	When counting on, children might change the denominator Eg the might say 9 tenths, 10 tenths, 11 elevenths, 12 twelfth etc Children might not recognise when counting in fractions that 10/10 can also be said as 'one whole'.	   

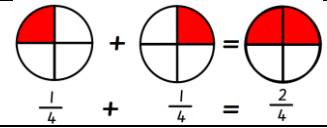
Y3 NC Objective: Recognise and show, using diagrams, equivalent fractions with small denominators. (WRMH Summer Block 1 2018) <u>Small steps:</u> - Using diagrams to show equivalence - Finding equivalent fractions				Previous year group objective/s (Y2): Recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$.
				Next year group objective/s (Y4): Recognise and show, using diagrams, families of common equivalent fractions.
Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)
_____ is the same as/equal to/equivalent to _____. _____ is equivalent to _____ because ... There are _____ halves in 1 whole. There are _____ thirds/ quarters / fifths / sixths / tenths in one whole.	Whole Part Numerator Denominator Fraction bar Fraction Representation Equal Half Third Quarter Fifth Sixth Tenth Equivalent to The same as Pattern	When fractions are equivalent, the denominators are in the same times table.	The numerators are the same so the fraction must be equivalent. You can add the numerator and denominator to find equivalent fractions. Children might not realise that we can say $\frac{3}{3}$ or $\frac{2}{2}$ or $\frac{4}{4}$ is the same as one whole.	

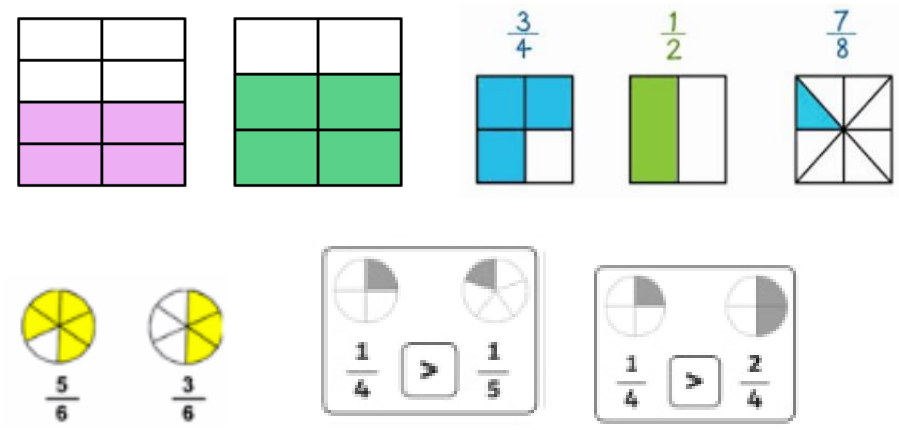
© Please note that some ideas and representations are originally from documents such as the White Rose Maths Hub, NCETM etc

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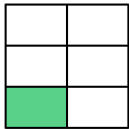
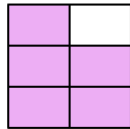
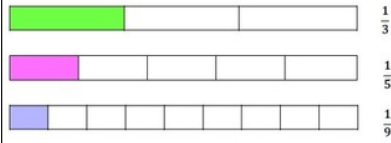
Y3 NC Objective: Add and subtract fractions with the same denominator within one whole. (WRMH Summer Block 1 2018) <u>Small steps:</u> - Understanding adding fractions - Applying understanding of adding fractions - Understanding subtracting fractions - Applying understanding of subtracting fractions - Real life scenarios with addition and subtraction of fractions				Previous year group objective/s (Y2): NEW LEARNING
				Next year group objective/s (Y4): Add and subtract fractions with the same denominator.
Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)
The whole is split into ____ equal parts. I have added/subtracted ____ equal parts. I have ____ equal parts in total.	Whole Part Numerator Denominator Fraction bar Fraction Representation Equal Half Third Quarter Fifth Sixth Tenth Equivalent to The same as	When we add/ subtract fractions with the same denominator, the denominator stays the same and the numerators are added/ subtracted. The denominators must be the same if we want to add or subtract fractions.	Adding and subtracting both the numerator and denominators. Trying to add/subtract fractions with different denominators.	 The CPA representations show three examples of fraction operations. The first example shows 3/4 + 1/4 = 4/4 using a 4x4 grid. The second example shows 3/4 - 1/4 = 2/4 using a 4x4 grid. The third example shows a real-life scenario with chocolate bars: 'First' shows 3 bars, 'Then' shows 1 bar crossed out, and 'Now' shows 2 bars remaining.

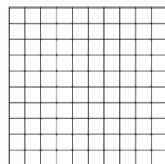
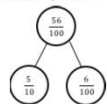
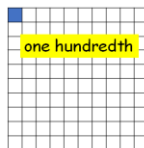
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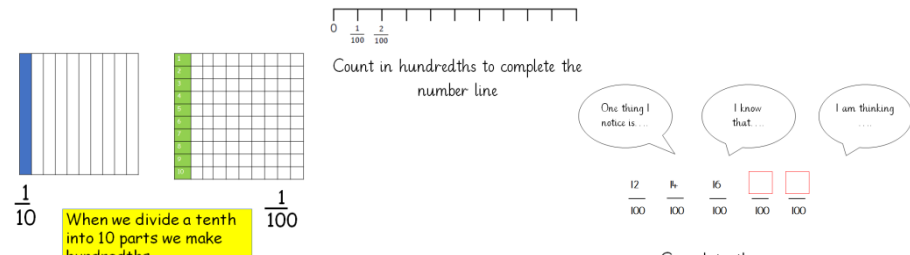
	Pattern Add Subtract			 
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<u>Y3 NC Objective:</u> Compare and order unit fractions, and fractions with the same denominators. (WRMH Summer Block 1 2018) <u>Small steps:</u> - Understanding fractions (parts and wholes) - Comparing and ordering unit fractions - Applying understanding of unit fractions - Comparing proper fractions with the same denominators				<u>Previous year group objective/s (Y2):</u> - Recognise, find, name and write fractions ($\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$) - Write simple fractions for example, $\frac{1}{2}$ of 6 = 3
				<u>Next year group objective/s (Y4):</u> Recognise and show, using diagrams, families of common equivalent fractions.
Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)
The whole has been divided into ____ equal parts. ____ is greater/less than ____. The whole has been split into more/less equal parts so that means each	Whole Part Numerator Denominator Fraction bar Fraction Representation Equal Half Third Quarter Fifth Sixth Tenth Equivalent to The same as Pattern	We can only compare/order fractions when the denominators are the same. The bigger the denominator, the smaller the part of the whole.	Trying to compare and order fractions based on the size of the whole rather than the fraction of the whole. Thinking that $\frac{1}{4}$ is bigger than $\frac{1}{2}$ because it has 4 parts and 4 is greater than 2.	

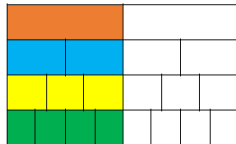
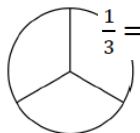
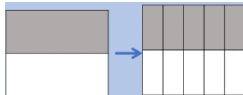
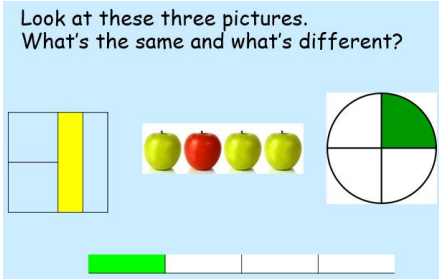
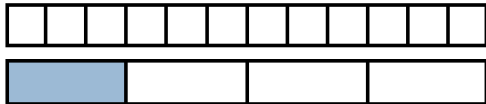
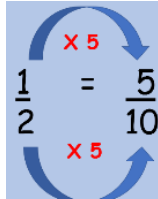
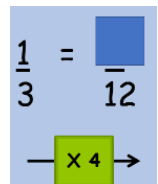
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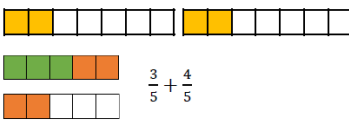
fraction is smaller/larger.	Order Compare Greater/less than Bigger/smaller			$\frac{1}{6}$  $\frac{5}{6}$ 	
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Y4 NC Objective: Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten (WRMH Spring Block 4 2018) <u>Small steps:</u> - To understand what 1/100 (and then non unit hundredths) of an object are. - To understand what 1/100 (and then non unit hundredths) of a quantity are. - To count up and down in hundredths and complete and create sequences of hundredths.				<u>Previous year group objective/s (Y3):</u> - Recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10. <u>Next year group objective/s (Y5):</u> - Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.												
Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)												
<u>Hundreds square/grid representation</u> _____ row on the 100 square is shaded. The fraction is _____. <u>General</u>	- Row - Square - Tenth - Hundredth - Hundred square - Fraction - Representation - Equal - Whole part - Part, part whole - Numerator - Denominator	When one is divided into ten equal parts each part is a tenth. When one tenth is divided into ten equal parts each part is one hundredth.	It doesn't matter how they are shaded. It doesn't matter is it is a column or row on the 100 square. Tenths are smaller than hundredths because 10 is smaller than 100.	Here is a hundred square.  Each square is ___ out of ___ equal squares. Each square represents Each row is ___ out of ___ equal rows. Each row represents <table><thead><tr><th>Shaded</th><th>Tenths</th><th>Hundredths</th></tr></thead><tbody><tr><td>2 rows</td><td>$\frac{2}{10}$</td><td>$\frac{20}{100}$</td></tr><tr><td>4 rows</td><td></td><td></td></tr><tr><td></td><td>$\frac{7}{10}$</td><td></td></tr></tbody></table> We can partition 56 hundredths into tenths and hundredths  Partition: 65 hundredths 31 hundredths 82 hundredths One whole divided into 100 pieces  one hundredth $\frac{1}{100}$ Numerator Denominator	Shaded	Tenths	Hundredths	2 rows	$\frac{2}{10}$	$\frac{20}{100}$	4 rows				$\frac{7}{10}$	
Shaded	Tenths	Hundredths														
2 rows	$\frac{2}{10}$	$\frac{20}{100}$														
4 rows																
	$\frac{7}{10}$															

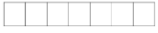
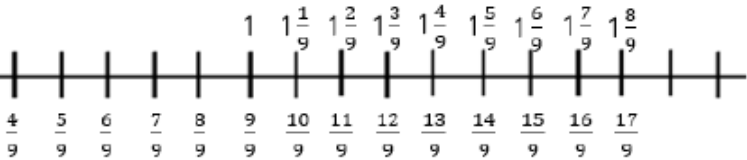
_____ equal parts are shaded. The fraction is _____.		One tenth is larger than one hundredth/One hundredth is smaller than one tenth.		
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<u>Y4 NC Objective:</u> Recognise and show, using diagrams, families of common equivalent fractions. (WRMH Spring Block 4 2018) <u>Small steps:</u> - investigate and understand the concept of equivalent fractions (supported by a fraction wall). - investigate equality and inequality statements using fractions of different denominators. - find equivalent fractions of a given fraction. - To find equivalent fractions of a "string" of fractions with missing numerators or denominators. - To prove whether certain fractions are equal to others. - consider how fractions could be simplified by applying understanding of equivalence.				<u>Previous year group objective/s (Y3):</u> Explain the difference between a unit and non- unit fraction and know the unit fraction represented.
				<u>Next year group objective/s (Y5):</u> Identify, name and write equivalent fractions of a given fraction, represented visually including tenths and hundredths.
Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)

_____ is the same as/ equal to/ equivalent to _____. _____ is equivalent to _____ because the _____ are the same. Whatever you do to the _____ you do to the _____ There are _____ halves in 1 whole. There are _____ quarters in 1 whole. There are _____ eighths in 1 whole.	- Fraction - Representation - Equivalent - Equivalence - Fraction wall - Diagram - Numerator - Denominator - Unit fraction - Non-unit fraction - Equal - Simplified - Multiply - Pattern - Relationship - Compare	When you multiply the numerator by a number you must multiply the denominator by the same the number. When you divide the numerator by a number you must divide the denominator by the same the number.	The numerators are the same so the fraction must be equivalent You can add to the numerator and denominator to find equivalent fractions.	  $\frac{1}{3} = \frac{\square}{6} = \frac{\square}{12} = \frac{\square}{24}$  	Look at these three pictures. What's the same and what's different?  	  $\frac{1}{4} = \frac{\square}{12}$
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Y4 NC Objective: Add and subtract fractions with the same denominator (WRMH Spring Block 4 2018) <u>Small steps:</u> - Add fractions with the same denominator - Subtract fractions with the same denominator - Prove why denominators need to be equal to add or subtract				Previous year group objective/s (Y3): Children begin counting up and down in fractions to make a link with the whole.
				Next year group objective/s (Y5): Add and subtract fractions with the same denominator and denominators that are multiples of the same number.
Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)
The whole is split into _____ equal parts. I have added/subtracted _____ equal parts. I	- Fraction - Representation - Add - Subtract - Improper fraction	We add the numerators together and the denominators stay the same.	Adding and subtracting both the numerator and denominators Trying to subtract from whole	 

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have ____ equal parts in total.	• mixed number • Numerator • Denominator • Bar model • Number line • Finding the difference • Whole number • converting	When we subtract fractions with the same denominator, the denominator stays the same and the numerators are subtracted.	number/mixed number without converting to improper fraction	 $\frac{5}{7} + \frac{3}{7}$ Draw the representation for the denominator  Shade in the numerator  Cross out the numerator you are subtracting  $\frac{4}{9} + \frac{4}{9} + \frac{8}{9}$
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Y4 NC Objective: 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 (WRMH Spring Block 4 2018)

Small steps:

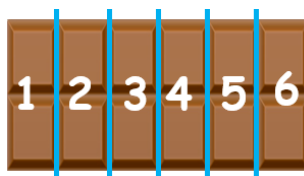
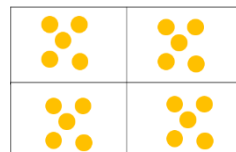
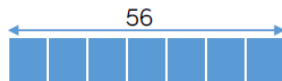
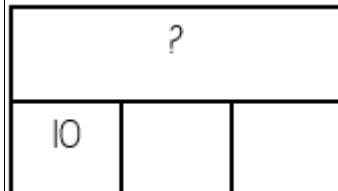
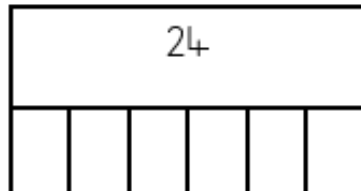
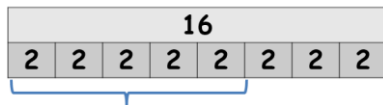
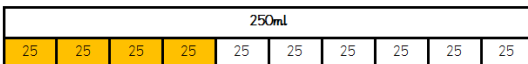
- To draw unit and non-unit fractions of objects
- To calculate unit fractions of amounts
- To calculate non-unit fractions of amounts
- To compare the relative size of different fractions of amounts in real life contexts.

Previous year group objective/s (Y3):

- Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.

Next year group objective/s (Y5):

- Link their understanding of fractions of amounts and multiplying fractions to use fractions as operators.

Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)															
___ is the whole The whole is split into ___ The fraction of the whole we are finding is ___ If I know ___ how can I find ___ of a number	• Fraction • Unit fraction • Non-unit fraction • Whole number • Numerator • Denominator • Bar model • Representation • Equal parts • Amount • Proper fraction • Calculate • Compare • Multiply • Divide	The denominator tells us how many equal parts a whole has been split into. The numerator tells us how many equal parts of the whole there are. To find a unit fraction of a quantity divide the amount by the denominator To find a non-unit fraction of a quantity divide the amount by the denominator	Not understanding that one third is the same as dividing by 3. $\frac{3}{4}$ of 12 is 4 because its quarters.	 $\frac{1}{4}$ of 20 =  $\frac{1}{7}$ of 56 = 56 ÷     <table><tr><th>Whole</th><th>Unit Fraction</th><th>Non-unit Fraction</th></tr><tr><td>The whole is 24</td><td>$\frac{1}{6}$ of 24 = ____</td><td>$\frac{5}{6}$ of 24 = ____</td></tr><tr><td>The whole is ____</td><td>$\frac{1}{3}$ of ____ = 30</td><td>$\frac{2}{3}$ of ____ = ____</td></tr><tr><td>The whole is ____</td><td>$\frac{1}{5}$ of ____ = 30</td><td>$\frac{3}{5}$ of ____ = ____</td></tr><tr><td>The whole is 4.5 l</td><td>$\frac{1}{10}$ of ____ = ____</td><td>$\frac{7}{10}$ of ____ = ____</td></tr></table> Draw a bar model to find $\frac{5}{8}$ of 16.  $\frac{2}{9}$ of 81 > $\frac{3}{4}$ of 	Whole	Unit Fraction	Non-unit Fraction	The whole is 24	$\frac{1}{6}$ of 24 = ____	$\frac{5}{6}$ of 24 = ____	The whole is ____	$\frac{1}{3}$ of ____ = 30	$\frac{2}{3}$ of ____ = ____	The whole is ____	$\frac{1}{5}$ of ____ = 30	$\frac{3}{5}$ of ____ = ____	The whole is 4.5 l	$\frac{1}{10}$ of ____ = ____	$\frac{7}{10}$ of ____ = ____
Whole	Unit Fraction	Non-unit Fraction																	
The whole is 24	$\frac{1}{6}$ of 24 = ____	$\frac{5}{6}$ of 24 = ____																	
The whole is ____	$\frac{1}{3}$ of ____ = 30	$\frac{2}{3}$ of ____ = ____																	
The whole is ____	$\frac{1}{5}$ of ____ = 30	$\frac{3}{5}$ of ____ = ____																	
The whole is 4.5 l	$\frac{1}{10}$ of ____ = ____	$\frac{7}{10}$ of ____ = ____																	

		and multiply by the numerator.		
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Y5 NC Objective: To identify, name and write equivalent fractions of a given fraction, represented visually including tenths and hundredths.

Small steps:

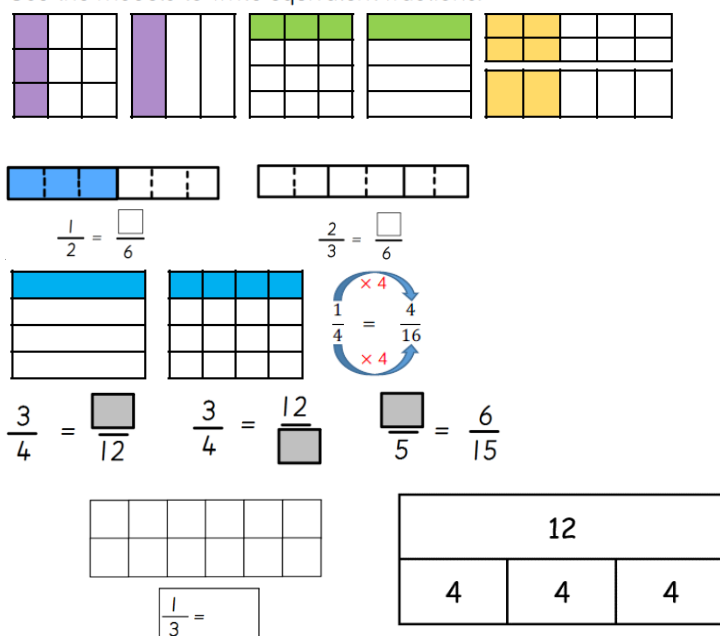
- Recognising equivalent fractions using a fraction wall.
- Calculating equivalent fractions
- Reasoning about equivalent fractions.

Previous year group objective/s (Y4):

- Recognise and show, using diagrams, families of common equivalent fractions.

Next year group objective/s (Y6):

- Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.

Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/ possible misconceptions	Representations (CPA)
The whole is divided into ____ equal parts, I have/ shaded ____ parts of the whole. I noticed that... I have been given both denominators, the relationship between them is_____. I have been given both numerators, the relationship between them is_____.	• Numerator • Denominator • Fraction bar • Relationship • Multiple • Multiply by • Times • Multiplication • Division • Inverse • Equal • Equivalent • Part/whole	Recognising When the denominator is ____ times the numerator you have the equivalent of _____. Calculating If you multiply the denominator by ____, multiply the numerator by ____. If you divide the denominator by ____, divide the numerator by _____.	Pupils using an unknown (numerator or denominator) as their starting point. Pupils need to work towards the unknown. Pupils not recognising the inverse. Kim says,  Whatever you do to the numerator, you do to the denominator. Here are the equivalent fractions she has found for $\frac{4}{8}$ $\frac{4}{8} = \frac{8}{16} \quad \frac{4}{8} = \frac{6}{10}$ $\frac{4}{8} = \frac{2}{4} \quad \frac{4}{8} = \frac{1}{5}$ Does Kim's method work? Explain why.	Use the models to write equivalent fractions.  I need to shade 4 squares out of 12 to have the equivalent of one third.

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Y5 NC Objective: To compare and order fractions whose denominators are multiples of the same number.

Small steps:

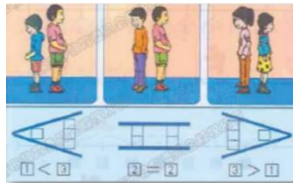
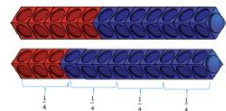
- Ordering fractions with similar denominators.
- Finding common multiples and the lowest common multiple.
- Ordering fractions whose denominators are multiples of the same number
- Application of understanding of ordering fractions.

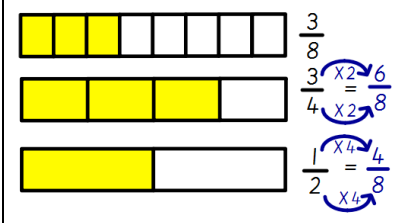
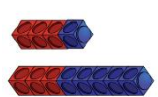
Previous year group objective/s (Y4):

- 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.

Next year group objective/s (Y6):

- Compare and order fractions, including fractions > 1

Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/ possible misconceptions	Representations (CPA)
The whole has been divided into ____ equal parts. The wholes <u>have / have not</u> been divided into the same number of equal parts. Find an equivalent fraction by...	- Numerator - Denominator - Fraction bar - Division - Divide - Equal - Equivalent - Part/whole - Greater than - Less than - Equal/equivalent - Equal parts - Compare - Order - Largest/smallest - Ascending/descending	We can only <u>compare/order</u> fractions when the denominators are the same. Make the denominators the same. Find an equivalent fraction for the fraction (s) with the smallest denominator. When the denominators are the same, the bigger the	Trying to compare/ order fractions when the denominators are still different and therefore comparing by the numerators. Trying to find an equivalent fraction by dividing the fraction with the largest denominator and therefore not being able to divide the numerator. The whole not being the same size for concrete or pictorial representations.	Comparing  Use cubes to help you compare $\frac{1}{4}$ and $\frac{5}{12}$  $\frac{4}{9} < \frac{2}{3}$ $\frac{3}{5} < \frac{7}{10}$ $\frac{7}{10} > \frac{3}{5}$ $\frac{2}{3} = \frac{6}{9}$ (via $\times 3$)

		numerator the bigger the fraction.		Ordering  Put these fractions in order from the smallest to the largest. $\frac{11}{12} \quad \frac{3}{4} \quad \frac{4}{6}$ <i>smallest → largest</i> $\frac{3}{8}, \frac{1}{2}, \frac{3}{4}$ Ash makes $\frac{3}{4}$ and $\frac{3}{8}$ out of cubes.  He thinks that $\frac{3}{8}$ is equal to $\frac{3}{4}$. Do you agree? Explain your answer.
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Y5 NC Objective: Add and subtract fractions with the same denominator and that are multiples of the same number.

Small steps:

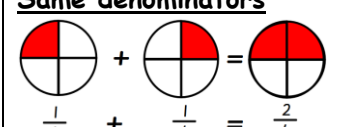
- Add fractions with the same denominator expressing answers as improper fractions
- Subtract fractions with the same denominator expressing answers as improper fractions.
- Add fractions with denominators which are multiples of the same number expressing answers as improper fractions.
- Subtract fractions with denominators which are multiplies of the same number expressing answers as improper fractions.
- Application of understanding of adding and subtracting fractions.

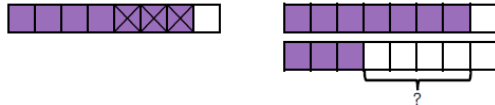
Previous year group objective/s (Y4):

- Adding fractions with the same denominator

Next year group objective/s (Y6):

- Add and subtract fractions with different denominations and mixed numbers, using the concept of equivalent fractions.

Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)
If the whole has been divided into 5 equal parts, the unit of measure is fifths. If the whole has been divided into ____ equal parts,	• Numerator • Denominator • Fraction bar • Part/whole • Equal parts • Addition • Subtraction • Unit of measure	Same denominators Keep the denominator the same, add the numerators. Keep the denominator the same, subtract the numerators. Different denominators	Adding/ subtracting the denominators. Not understanding that the denominator is the unit of measure. The unit of measure must be the same in	Same denominators  $\frac{1}{4} + \frac{1}{4} = \frac{2}{4}$ $\frac{1}{4} + \frac{1}{4} = \frac{2}{8}$ $\frac{1}{4} + \frac{1}{4} = \frac{1+1}{4} = \frac{2}{4}$

the unit of measure is _____.	- Equivalent fraction - Multiply - Divide	Make the denominators the same. Keep the denominator the same, add the numerators. Make the denominators the same. Keep the denominator the same, subtract the numerators.	order to add/ subtract them.	Here are two bar models to calculate $\frac{7}{8} - \frac{3}{8}$  Different denominators  $\frac{7}{9} - \frac{1}{3} =$ $\frac{1}{3} = \frac{3}{9}$ $\frac{7}{9} - \frac{3}{9} = \frac{4}{9}$  $\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$ $\frac{1}{3} \times \frac{3}{3} = \frac{3}{9}$ $\frac{1}{9} + \frac{3}{9} = \frac{4}{9}$
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Y5 NC Objective: Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements >1 as a mixed number.

Small steps:

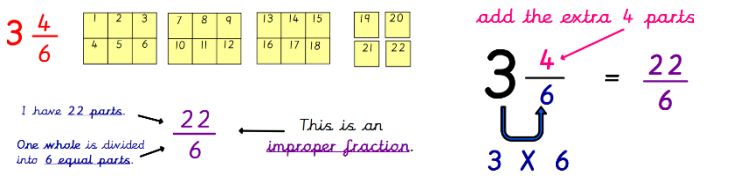
- Recognise using diagrams how improper fractions can be expressed as a mixed number
- Convert improper fractions to mixed numbers
- Convert mixed numbers to improper fractions.

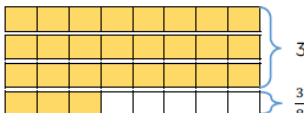
Previous year group objective/s (Y4):

- Add and subtract fractions with the same denominator. (When the answer becomes more than 1 whole.)

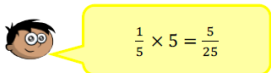
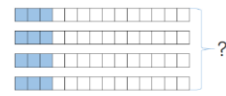
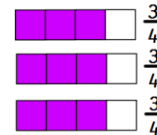
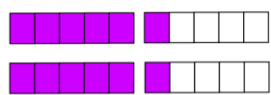
Next year group objective/s (Y6):

- Multiply simple pairs of proper fractions, writing the answer in its simplest form

Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)
Mixed number I have _____ wholes. Each whole has been divided into _____ equal parts. I have _____ equal additional parts. Improper Fractions	- Numerator - Denominator - Fraction bar - Parts - Whole(s) - Equal parts - Mixed Number - Improper Fraction - Multiply - Lots of - Times	Mixed number A mixed number is a mixture of a whole number and a fraction. Improper Fractions When you have more than one whole, an improper fraction is how many parts you have. Converting mixed numbers into improper fractions.	This is incorrect 	Recognising and understanding mixed numbers  Converting mixed numbers to improper fractions  add the extra 4 parts $3 \frac{4}{6} = \frac{22}{6}$ 1 have 22 parts. → $\frac{22}{6}$ ← This is an improper fraction. One whole is divided into 6 equal parts. → $\frac{22}{6}$ 3×6

Each whole has been divided into ____ equal parts. I have ____ equal parts in total. The ____ represents ____.	• Product • Divide • Groups of • Remainder • Recognise • Convert	Multiply the whole number by the denominator. Add the numerator. <u>Converting improper fractions into mixed numbers.</u> Divide the numerator by the denominator. Write the remainder as a fraction.	Not recognising that another whole can be made when working with concrete or pictorial representations. These pupils do not have a clear understanding of whateach digit represent (wholes and parts). Three children have converted $3\frac{2}{5}$ into an improper fraction. Child A: $3\frac{2}{5} = \frac{32}{5}$ Child B: $3\frac{2}{5} = \frac{17}{15}$ Child C: $3\frac{2}{5} = \frac{7}{5}$	Converting improper fractions into mixed numbers $\frac{9}{4}$  Wholes = 2 $\frac{1}{4}$ out of a possible 4 9 parts (Kit Kat fingers) divided into groups of 4 (whole Kit Kats) = 2 wholes and 1 part out of a possible 4. $\frac{27}{8}$  3 $\frac{3}{8}$ $27 \div 8 = 3 \text{ r } \frac{3}{8}$
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<u>Y5 NC Objective:</u> To be able to multiply proper fractions and mixed numbers by whole numbers supported by materials and diagrams. <u>Small steps:</u> • Multiply unit fractions by one digit numbers using diagrams and recognising multiplication as repeated addition. • Multiply non unit fractions by one digit numbers using diagrams and recognising multiplication as repeated addition. • Multiply mixed numbers by whole numbers. • Application of understanding of multiplying fractions and mixed numbers by whole numbers.				<u>Previous year group objective/s (Y4):</u> • Adding fractions with the same denominator <u>Next year group objective/s (Y6):</u> • Multiply simple pairs of proper fractions, writing the answer in its simplest form
Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)

I have <i>one-quarter</i>, <i>three</i> times. This makes _____ I have <i>three</i> lots of <i>one-quarter</i>. This is the same as _____. What does the _____ in _____ represent?	• Numerator • Denominator • Multiplication • Lots of • Multiply by • Times • Product • Repeated addition • Bar model • Fraction bar • Integer • Number • Digit • Figure • Mixed number • Whole number	When multiplying a fraction by a whole number, write the calculation as repeated addition. When multiplying a mixed number by a whole number, write the calculation as repeated addition. Add the whole. Add the fractions.	Ranjit is multiplying fractions by a whole number.  Can you explain his mistake? Denise has calculated $4 \times \frac{3}{14}$  From the picture I can see that $4 \times \frac{3}{14} = \frac{12}{14}$ Do you agree? Explain why.	Multiplying proper fractions by whole numbers. $3 \times \frac{1}{4} = \frac{3}{4}$ I have <i>one quarter</i>, <i>three</i> times.  $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{3}{4}$ $3 \times \frac{3}{4} = \frac{9}{4}$ I have <i>three quarters</i>, <i>three</i> times.  $\frac{3}{4} + \frac{3}{4} + \frac{3}{4} = \frac{9}{4} = 2\frac{1}{4}$ Multiplying mixed numbers by whole numbers. $2 \times 1\frac{1}{5} = 2\frac{2}{5}$ I have <i>one whole and one fifth</i>, <i>two</i> times.  $1\frac{1}{5} + 1\frac{1}{5} = 2\frac{2}{5}$ Add the wholes. $1 + 1 = 2$ Add the parts. $\frac{1}{5} + \frac{1}{5} = \frac{2}{5}$ Sally and three of her friends have $1\frac{2}{6}$ of pizza each. How much do they eat altogether? 
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Y5 NC Objective: Read and write decimal numbers as fractions.

Small steps:

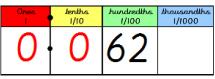
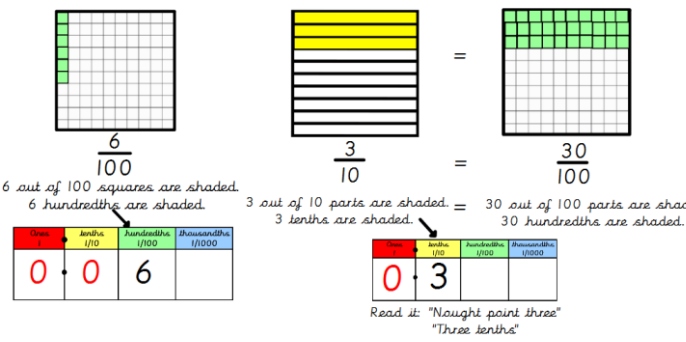
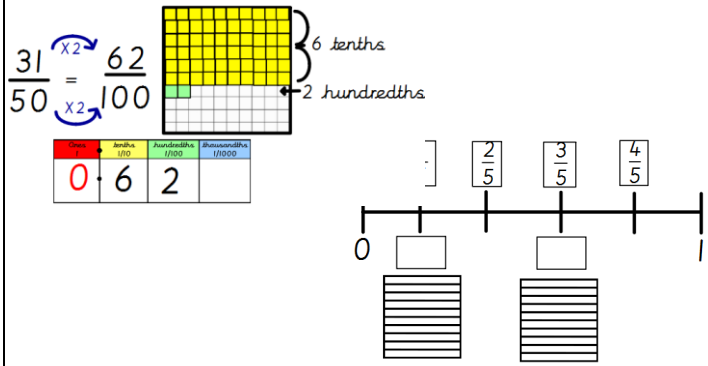
- Understand the relationship between tenths, hundredths and thousandths and their decimal equivalent.

Previous year group objective/s (Y4):

- Recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$. (Decimal block objective)

Next year group objective/s (Y6):

- Associate a fraction with division and calculate decimal fraction equivalents for a simple fraction
- **Year 6:** Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)
One whole has been divided into ____ equal parts. I have/ shaded ____ parts of the whole. What does ____ represent? The whole <u>has</u> / <u>has not</u> been divided by a power of 10.	- Numerator - Denominator - Relationship - Convert - Fraction - Decimal - Whole - Divided - Equal parts - Tenths - Hundredths - Thousandths - Power of 10 - Equivalent fraction - Equivalent / equal to - Multiply - Divide	Make the denominator a power of 10. <u>Useful previous conclusions:</u> Fraction: A whole is divided into equal parts. Decimals: A whole is divided into equal parts. It will always be divided by a power of 10. Equivalent fractions: If you <i>multiply/ divide</i> the denominator by ____, <i>multiply/ divide</i> the numerator by ____.	Pupils may write $\frac{62}{100}$ as 0.062.  This misunderstanding arises when pupils have not understood the equivalence between 1 tenth and 10 hundredths. Pupils may try to write fractions as a decimal without ensuring that their denominator is firstly a power of 10. Pupils may not choose an appropriate power of 10 to convert to e.g. if they try to make $\frac{31}{50}$ into tenths, the numerator would not be able to be divided.	 6 out of 100 squares are shaded. 6 hundredths are shaded. 3 out of 10 parts are shaded. 3 tenths are shaded. 30 out of 100 parts are shaded. 30 hundredths are shaded. Read it: "Naught point three" "Three tenths"  $\frac{31}{50} = \frac{62}{100}$ 6 tenths, 2 hundredths 0.62 2/5, 3/5, 4/5

Y5 NC Objective: Solve problems involving multiplication and division including scaling by simple fractions and problems involving simple rates. *Please note: This objective appears in the fraction block in 'White Rose Maths' and 'Maths Hub' materials but is categorised in the 'number: multiplication and division' section of the national curriculum.*

Small steps:

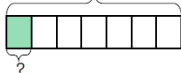
- Solve division problems where the remainder is expressed as a fraction.
- Scaling by simple fractions

Previous year group objective/s (Y4):

- 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.

Next year group objective/s (Y6):

- To be able to **associate a fraction with division** and calculate decimal fraction equivalents for a simple fraction.

Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)												
The whole is ____. The whole has been divided into ____ equal parts. Each part is worth ____. I have/ shaded ____ parts of the whole.	- Whole - Value - Divided - Divided by - Divided into - Equal parts - Division - Multiplication - Times more - Times larger - Times smaller - Numerator - Denominator - Fraction Bar - Improper Fraction - Repeated Addition	<u>Fractions of amounts</u> The denominator is how many parts the whole is divided into. The numerator is how many parts we shade/ have/ take. <u>Scaling down</u> Divide the whole number by the denominator. Multiply one part by the numerator. <u>Scaling up (if a mixed number)</u> When multiplying a mixed number by a whole number, write the calculation as repeated addition. Add the whole. Add the fractions.	Pupils may not define the whole accurately. Pupils may not make accurate links between fractions and division/ multiplication.	<u>Fractions of amounts</u> 20  We can say that $\frac{3}{4}$ of 20 is 15. Find $\frac{1}{7}$ of 42  42 $42 \div 7 = 6$ $\frac{1}{7}$ of 42 is 6 <u>Scaling by simple fractions</u> The following recipe makes enough fruit salad for 12 people. <table><tr><th colspan="2">Ingredients</th></tr><tr><td>4 bananas</td><td>2 large oranges</td></tr><tr><td>3 apples</td><td>16 grapes</td></tr><tr><td>12 blackberries</td><td>24 blueberries</td></tr><tr><td>22 strawberries</td><td>6 kiwi fruit</td></tr><tr><td>100ml lemonade</td><td>50ml fresh orange juice</td></tr></table> <u>Scaling down question examples:</u> Sam adapts this recipe to make fruit salad for 4 people. How many blueberries should he use? Pupils are required to calculate $\frac{1}{3}$ of 24 <u>or</u> Pupils associate fractions with division and calculate $24 \div 3$. <u>Scaling up question example:</u> Sam adapts this recipe to make fruit salad for 18 people. How many bananas should he use? Pupils are required to calculate $1\frac{1}{2} \times 4$.	Ingredients		4 bananas	2 large oranges	3 apples	16 grapes	12 blackberries	24 blueberries	22 strawberries	6 kiwi fruit	100ml lemonade	50ml fresh orange juice
Ingredients																
4 bananas	2 large oranges															
3 apples	16 grapes															
12 blackberries	24 blueberries															
22 strawberries	6 kiwi fruit															
100ml lemonade	50ml fresh orange juice															

Y6 NC Objective: To generate and describe linear number sequences (with fractions).

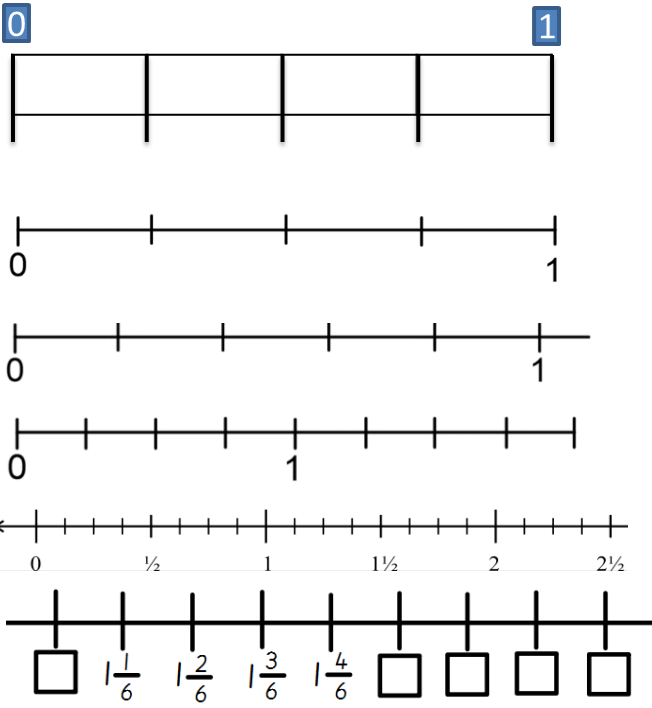
Small steps:

- Understand what a fraction is.
- Use double number lines to examine counting in fractions.
- Use number sequences to double and half unit fractions.

Previous year group objective/s (Y5):

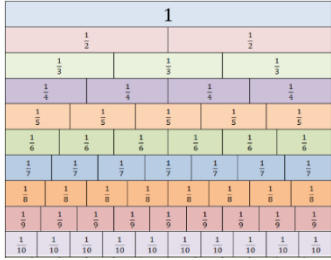
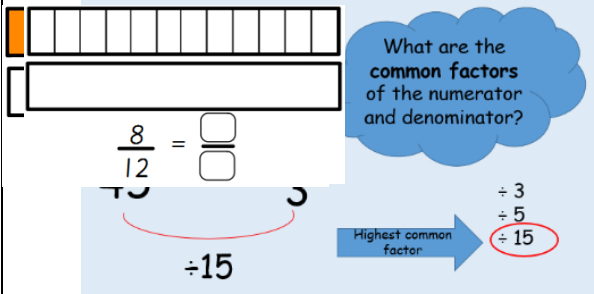
- Compare and order fractions whose denominators are multiples of the same number.

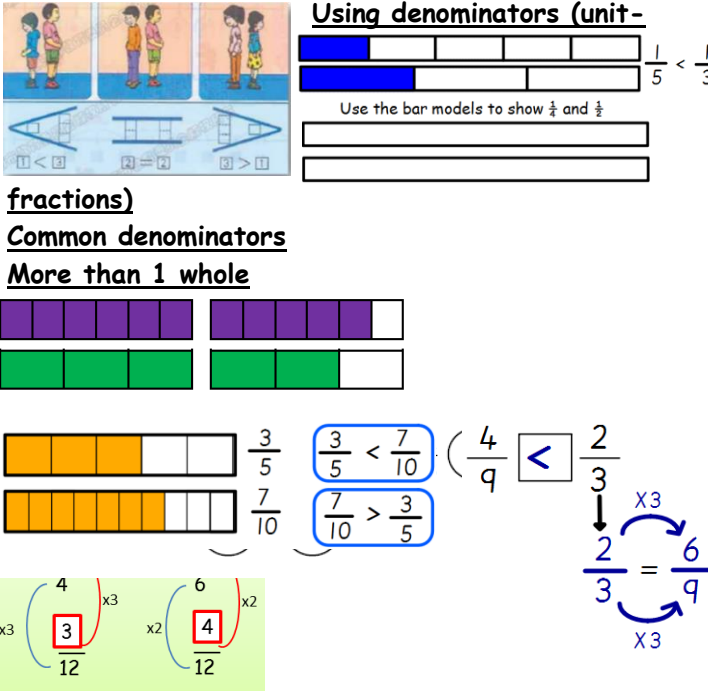
Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)
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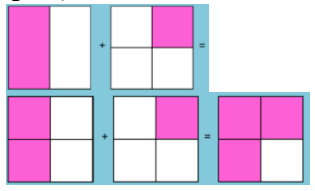
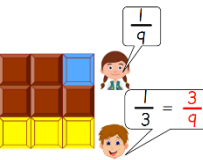
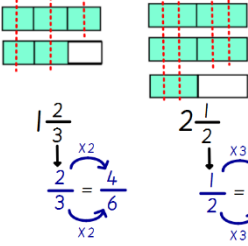
The whole is _____. The whole has been divided into _____ equal parts, each part is _____ of the whole. If the sequence is <i>decreasing/increasing</i> by ____ what numbers will be next in the sequence?	• Whole • Part • Equal parts • Fraction • Numerator • Denominator • Fraction bar • Equivalent • Simplify • Divide • Division • Order • Compare • Number line • Unknown • Find the difference	To find a missing fraction on a number line, identify the whole. Then, find out how many equal parts the whole has been divided into. When the whole is not defined, find the difference between the given fractions.	Pupils may not define the whole correctly. Number lines which extend beyond 1 may cause confusion without a secure knowledge of mixed number/improper fractions.	
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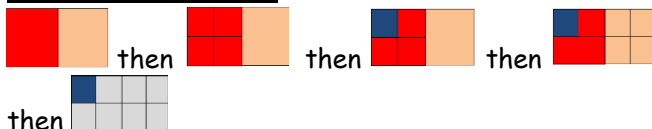
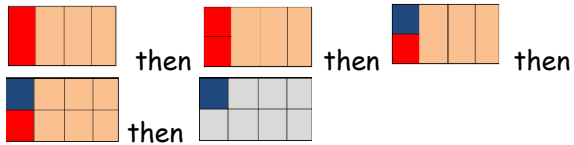
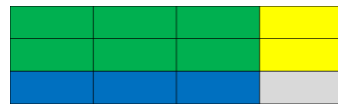
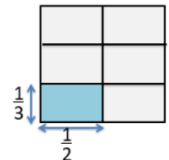
<u>Y6 NC Objective:</u> To use common factors to simplify fractions; use common multiples to express fractions in the same denomination. <u>Small steps:</u> • Identifying the lowest common multiple and the highest common factor • Explain equivalent fractions • Determine when numerators and denominators are co-prime				<u>Previous year group objective/s (Y5):</u> • To identify, name and write equivalent fractions of a given fraction, represented visually including tenths and hundredths.
Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)

Humber Education Trust
Fractions Policy
Planning support document

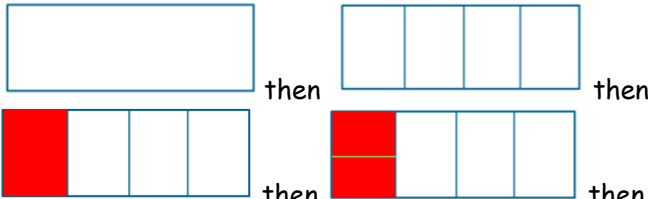
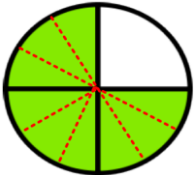
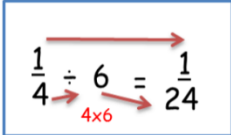
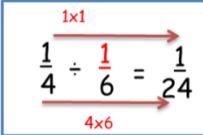
The numerator and the denominator are both in the _____ times table. The highest common factor of ____ and ____ is _____.	• Numerator • Denominator • Fraction bar • Equivalent • Equivalent fraction • Simplify • Common factor • Highest common factor • Multiple • Factor • Divide • Division	To simplify a fraction to its simplest form, find the highest common factor of the numerator and denominator. If the numerator is a factor of the denominator, we can simplify to a unit fraction. <u>Sentence stem from Y5</u> Equivalent fractions: If you divide the denominator by _____, divide the numerator by _____.	Pupils may identify incorrect factors. Pupils may use the lowest common factor instead of the highest common factor. Pupils may always halve the numerator and denominator. This may not be the fractions simplest form. Pupils may not understand that simplifying fractions is not any equivalent; it is using the highest common factor.	Use the fraction wall to simplify $\frac{3}{9}$.  Which direction did you move in? What have the numerator and denominator been divided by? 
<u>Y6 NC Objective:</u> To compare and order fractions, including fractions > 1 <u>Small steps:</u> • Compare and order fractions using denominators • Compare and order fractions using numerators • Compare and order fractions using common denominators • Compare and order fractions using common numerators				<u>Previous year group objective/s (Y5):</u> • To compare and order fractions whose denominators are multiples of the same number.
Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)

The whole has been divided into ____ equal parts. The wholes <u>have</u> / <u>have not</u> been divided into the same number of equal parts. Find an equivalent fraction by...	- Numerator - Denominator - Fraction bar - Equivalent - Simplify - Common factor - Highest common factor - Multiple - Factor - Divide - Ascending /descending - Part/whole - Greater than/less than - Equal parts - Compare - Order - Largest/smallest	When comparing/ ordering unit fractions, the larger the denominator the smaller the unit fraction (part). When comparing/ ordering fractions with the same denominators, compare/order the numerators. To order/ compare fractions with different denominators, convert the denominators the make them the same. Compare/ order the numerators.	Pupils may not be secure with equivalent fractions. Pupils may compare non-unit fractions which have not been expressed with the same denominator.	 Using denominators (unit-fractions) Common denominators More than 1 whole
<u>Y6 NC Objective:</u> To add and subtract fractions with different denominations and mixed numbers, using the concept of equivalent fractions <u>Small steps:</u> - Adding proper fractions using common denominators. - Adding mixed number fractions - Subtracting proper fractions using common denominators. - Subtracting mixed number fractions				<u>Previous year group objective/s (Y5):</u> Add and subtract fractions with the same denominator and that are multiples of the same number.
Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)

The wholes <u>have / have not</u> been divided into the same number of equal parts. The unit of measure is ____ (e.g. <i>sixths, quarters, thirds</i>).	- Numerator - Denominator - Fraction bar - Equivalent - Simplify - Common factor - Highest common factor - Multiple - Factor - Divide - Part/whole - Equal parts - Addition - Subtraction	We do not add/subtract the denominators because they are the unit of measure. <u>Different denominators</u> Applied sentence stem from year 5: Make the denominators the same. Keep the denominator the same, add the numerators. Make the denominators the same. Keep the denominator the same, subtract the numerators.	Pupils may add/subtract the denominators. Not understanding that the denominator is the unit of measure. The unit of measure must be the same in order to add/ subtract them.	<u>Different denominators</u> $\frac{1}{2} + \frac{1}{4}$  Addition  $\frac{1}{9} + \frac{1}{3} = \frac{4}{9}$ $\frac{1}{3} = \frac{3}{9}$ $\frac{1}{9} + \frac{3}{9} = \frac{4}{9}$ Subtraction <u>Mixed Numbers</u>  $1\frac{2}{3} + 2\frac{1}{2} = 3\frac{7}{6} = 4\frac{1}{6}$ $\frac{7}{9} - \frac{1}{3} = \frac{4}{9}$ $\frac{1}{3} = \frac{3}{9}$ $\frac{7}{9} - \frac{3}{9} = \frac{4}{9}$
<u>Y6 NC Objective:</u> To multiply simple pairs of proper fractions, writing the answer in its simplest form <u>Small steps:</u> - Use arrays to examine multiplication of numbers less than one. - Multiplying pairs of proper fractions - Investigating equivalence when multiplying with fractions				<u>Previous year group objective/s (Y5):</u> To be able to multiply proper fractions and mixed numbers by whole numbers supported by materials and diagrams.
Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)

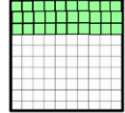
Example: $\frac{1}{2} \times \frac{1}{4} =$ <u>Half of one quarter.</u> <u>One quarter of half.</u> Example: $\frac{1}{2} \times \frac{1}{4} =$ For every <u>half</u> there are <u>four</u> <u>quarters</u>. For every <u>quarter</u> there are <u>two</u> <u>halves</u>. Example: $\frac{3}{4} \times \frac{2}{3} =$ For every <u>quarter</u> there are <u>three</u> <u>thirds</u>. General sentence stem: For every _____ there are _____	• Multiplication • Times • Groups • Of • Ratio • Area • Fraction • Numerator • Denominator • Fraction bar • Whole • Equal parts	To multiply fractions, multiply the denominators together, then multiply the numerators together.	Pupils may not understand the structure of multiplication. Pupils may only understand multiplication as repeated addition.	$\frac{1}{2} \times \frac{1}{4} =$ 'half of one quarter' or 'one quarter of half' One quarter of half:  Half of one quarter:  $\frac{3}{4} \times \frac{2}{3} = \frac{6}{12}$  For every one quarter, we have 3 thirds so there are now 12 parts in the whole and for each of the 3 quarters there are 2 thirds so there are 6 pieces out of the 12 in the whole. Area model $\frac{1}{3} \times \frac{1}{2}$ 
<u>Y6 NC Objective:</u> To divide proper fractions by whole numbers. <u>Small steps:</u> • Use arrays to examine division • Divide proper fractions by whole numbers • Investigating equivalence when dividing with fractions • Investigating equivalence with fraction division and multiplication				<u>Previous year group objective/s (Y5):</u> • Solve problems involving multiplication and division including scaling by simple fractions and problems involving simple rates. • To be able to multiply proper fractions and mixed numbers by whole numbers supported by materials and diagrams.
Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)

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One whole has been divided into _____ equal parts. I have/ shaded _____ part(s) of the whole. Each _____ has been divided into _____ equal parts. Example $\frac{1}{4} \div 2 =$ One whole has been divided into <u>four</u> equal parts. I have/ shaded <u>one</u> part(s) of the whole. Each <u>quarter</u> has been divided into <u>two</u> equal parts.	• Whole • Divided • Divided by • Divided into • Equal part(s) • Parts • Fraction • Numerator • Denominator • Fraction Bar • Multiply • Whole number	To divide fractions, multiply the denominator by the whole number.	Roman says  When dividing fractions by a whole number, I just ignore the numerator. Do you agree? Explain why. Pupils may attempt to divide by the numerator and denominator by the whole number.	$\frac{1}{4} \div 2 =$  $\frac{1}{4} \div 2$ is $\frac{1}{8}$ $\frac{1}{4} \div 2$ is the same as $\frac{1}{4} \times \frac{1}{2}$ $\frac{3}{4} \div 3$   
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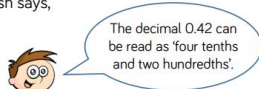
<u>Y6 NC Objective:</u> To associate a fraction with division and calculate decimal fraction equivalents for a simple fraction <u>Small steps:</u> • Finding equivalence with tenths, hundredths and thousandths • Using short division to find equivalence • Use the relationship between division and fractions to solve problems				<u>Previous year group objective/s (Y5):</u> • Read and write decimal numbers as fractions. In year 5, pupils convert fractions into decimals by calculating equivalent fractions which have a denominator that is a power of 10.
Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)

Humber Education Trust
Fractions Policy
Planning support document

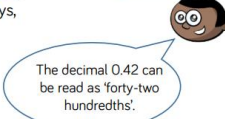
____ out of ____. ____ divided by ____. ____ ÷ ____. Exchange ____ for ____.	• Fraction • Decimal • Equal • Equivalent • Equivalence • Same as • Numerator • Denominator • Fraction Bar • Out of • Divided by • Division • Equal groups • Exchange • Whole • Tenths • Hundredths • Thousandths • Dividend • Divisor • Quotient	Numerator ÷ Denominator To write a fraction as a decimal, divide the numerator by the denominator.	Pupils may divide the denominator by the Charlotte and Stephen have both attempted to convert $\frac{2}{8}$ into a decimal.   Who is correct? Prove it. numerator. Pupils may not recognise that the fraction bar represents 'out of', which relates to 'divided by'. Pupils may not have a secure understanding of dividing decimal numbers.	  $\frac{3}{10} = \frac{30}{100}$ 3 out of 10 parts are shaded. 3 tenths are shaded. 30 out of 100 parts are shaded. 30 hundredths are shaded.  Read it: "Naught point three" "Three tenths"
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Equivalence with

Josh says,



Bix says,



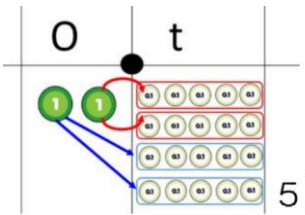
Who do you agree with?
Explain your answer.

tenths and

hundredths

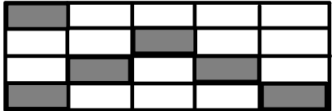
Using short division to find equivalence

$\frac{2}{5}$ = 'two out of five'
 = 'two divided by 5'
 = $2 \div 5$



$5 \overline{)2.0} = 0.4$

<u>Y6 NC Objective:</u> To recall and use equivalences between simple fractions, decimals and percentages, including in different contexts <u>Small steps:</u> • Associate fractions and decimals with percentages • Compare and order fractions, decimals and percentages • Determining the most appropriate equivalence in different contexts				<u>Previous year group objective/s (Y5):</u> • Read and write decimal numbers as fractions. From percentages block: • Write percentages as a fraction with denominator 100, and as a decimal fraction.
Sentence stems	Key vocabulary	Conclusion/Rule	What it's not/possible misconceptions	Representations (CPA)

<u>Equivalent fractions</u> If you multiply/ divide the numerator by ____, multiply/ divide the denominator by ____. <u>Fractions to decimals</u> ____ out of ____. ____ divided by ____. ____ ÷ ____. Exchange _____ for _____. A percentage will always have ____ equal parts. ____ is therefore equivalent to _____.	• Fraction • Percentage • Decimal • Equal • Equivalent • Same as • Numerator • Denominator • Fraction Bar • Out of • Divided by • Division • Equal groups • Exchange • Whole • Tenths • Hundredths • Thousandths • Dividend • Divisor • Quotient	<u>Fraction to Decimal</u> Divide the numerator by the denominator. <u>Fraction to a Percentage</u> Find an equivalent fraction, where the denominator is 100. <u>Percentage to Fraction</u> 100 becomes the denominator and the given percentage becomes the numerator.	Pupils may not convert given fractions to a fraction with a denominator of 100 before using the numerator for the percentage. Pupils may not recognise that the fraction bar represents 'out of', which relates to 'divided by'. Pupils may not have a secure understanding of dividing decimal numbers. Pupils may not convert given mixed FDPs into a common unit of measure before comparing.	How much of this shape had been shaded? Write your answer as a percentage.  $\frac{6}{20} = \frac{30}{100} = 30\%$ Write your answer as a decimal number. $\frac{6}{20} = \frac{3}{10} = 0.3$ $\frac{6}{20} = 2 \text{ } 0 \text{ } 6 \text{ } 0 = 0.3$
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