



HILLSBOROUGH
NURSERY & PRIMARY SCHOOL

Hillsborough Primary school

Maths Content and progression

Fractions, decimals and percentages

Progression of skills overview

Fractions, Decimals AND Percentages						
Counting in Fractional steps						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		Pupils should count in fractions up to 10, starting from any number and using the $\frac{1}{2}$ and $\frac{2}{4}$ equivalence on the number line.	count up and down in tenths	count up and down in hundredths		
Recognising Fractions						
Solve problems , including doubling, halving and sharing.	recognise, find and name a half as one of two equal parts of an object, shape or quantity	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	recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators	recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten	recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	
			recognise that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10.			
	recognise, find and name a quarter as one of four equal parts of an object, shape or quantity		recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators			
Comparing Fractions						
			compare and order unit fractions, and fractions with the same denominators		compare and order fractions whose denominators are all multiples of the same number	compare and order fractions, including fractions >1
Comparing Decimals						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				compare numbers with the same number of decimal places up to two decimal places	read, write, order and compare numbers with up to three decimal places	identify the value of each digit in numbers given to three decimal places

Rounding including Decimals						
				round decimals with one decimal place to the nearest whole number	round decimals with two decimal places to the nearest whole number and to one decimal place	solve problems which require answers to be rounded to specified degrees of accuracy
Equivalence (inc. F/D/P)						
		write simple fractions e.g. $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$.	recognise and show, using diagrams, equivalent fractions with small denominators	recognise and show, using diagrams, families of common equivalent fractions	identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths	use common factors to simplify fractions; use common multiples to express fractions in the same denomination
				recognise and write decimal equivalents of any number of tenths or hundredths recognise and write decimal equivalent for to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$	read and write decimal numbers as fractions (e.g. $0.71 = \frac{71}{100}$)	associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$)
					recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	
Addition and Subtraction of Fractions						
			add and subtract fractions with the same denominator within one whole (e.g. $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$)	add and subtract fractions with the same denominator	add and subtract fractions with the same denominator and multiples of the same number	add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
					recognise mixed numbers and improper fractions and convert from one form to the other e.g. > 1 as a mixed number (e.g. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$)	
Multiplying and Dividing Fractions						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$)
						multiply one-digit numbers with up to two decimal places by whole

						numbers
						divide proper fractions by whole numbers (e.g. $\frac{1}{3} \div 2 = \frac{1}{6}$)

Multiplying and Dividing Decimals

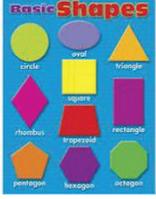
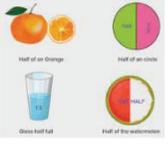
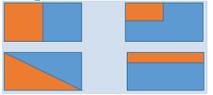
						multiply one-digit numbers with up to two decimal places by whole numbers
				find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths		multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places
						identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places
						associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$)
						use written division methods in cases where the answer has up to two decimal places

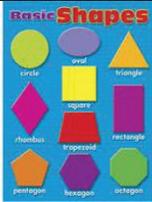
Problem Solving

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			solve problems that involve all of the above	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	solve problems involving numbers up to three decimal places	
				solve simple measure and money problems involving fractions and decimals to two decimal places.	solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$ and those with a denominator of	

					a multiple of 10 or 25.	
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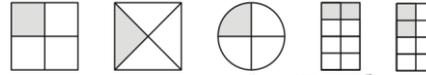
Year 1.

NC Objective	Learning Objectives	Pre-learning	Methods from Calculation Policy	Key Questions for GDS
<p>recognise, find and name a half as one of two equal parts of an object, shape or quantity</p>	<p>Recognise, find and name a half as one of two equal parts of an object, shape or quantity</p> <p>Vocabulary fraction equal part equal grouping equal sharing one of two equal parts</p>	<p>Solve problems, involving doubling, halving and sharing.</p> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 5px; width: 45%;"> <p>Nick had 8 apples yesterday but now half has been eaten. How many apples does Nick have now?</p>  </div> <div style="border: 1px solid black; padding: 5px; width: 45%;"> <p>Erno has 5 potatoes but she wants double for her recipe. How many potatoes does Erno need?</p>  </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid black; padding: 5px; width: 45%;"> <p>Philip has 6 pencils, Simon has double that amount. How many pencils does Simon have?</p>  </div> <div style="border: 1px solid black; padding: 5px; width: 45%;"> <p>Jess has 8 cocoa beans, Nick has half this amount. How many cocoa beans does Nick have?</p>  </div> </div> <p>Recap describing different 2D shapes</p> 	<p>Use objects with pupils and get them to estimate initially a half.</p> <p>Objects like a metre rule would be useful in the first instance.</p> <p>Estimate what half of a given object and shape might be.</p> <p>Explain to class that a fraction is a part of one whole</p> <p>Use practical apparatus to show half of a given number of objects. Show they understand that halves are two equal parts.</p> <div style="display: flex; justify-content: space-around; margin-top: 10px;">    </div>	<p>Can you split each of these shapes into two equal halves?</p> <p>Explain why for each shape</p> <div style="display: flex; justify-content: space-around; margin-top: 10px;">   </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;">   </div> <p>Which of these shapes has a half shaded?</p>  <p>Explain your answer</p>
<p>recognise, find and name a quarter as one of four equal parts of an object, shape or quantity</p>	<p>Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity</p> <p>Vocabulary fraction equal part equal grouping equal sharing one of two equal parts one of four equal parts</p>	<p>Solve problems, involving doubling, halving and sharing.</p> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 5px; width: 45%;"> <p>Nick had 8 apples yesterday but now half has been eaten. How many apples does Nick have now?</p>  </div> <div style="border: 1px solid black; padding: 5px; width: 45%;"> <p>Erno has 5 potatoes but she wants double for her recipe. How many potatoes does Erno need?</p>  </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid black; padding: 5px; width: 45%;"> <p>Philip has 6 pencils, Simon has double that amount. How many pencils does Simon have?</p>  </div> <div style="border: 1px solid black; padding: 5px; width: 45%;"> <p>Jess has 8 cocoa beans, Nick has half this amount. How many cocoa beans does Nick have?</p>  </div> </div> <p>Recap describing different 2D shapes</p>	<p>Use objects with pupils and get them to estimate initially a half, and later a quarter.</p> <p>Objects like a metre rule would be useful in the first instance.</p> <p>Estimate what a quarter of a given object and shape might be.</p> <p>Explain to class that a fraction is a part of one whole</p> <p>Use practical apparatus to show a quarter of a given number of objects.</p> <p>Show they understand that quarters are four equal parts. One quarter can be written or or</p>	<p>Draw a circle, a rectangle and a square. Each shape represents one whole. Can you make these into quarters? Are they equal?</p> <p>In a fruit bowl, $\frac{1}{4}$ of the fruit are apples, $\frac{1}{4}$ of the fruit are oranges and there are 4 bananas, 3 pears and 3 plums</p> 



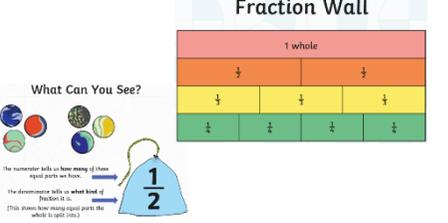
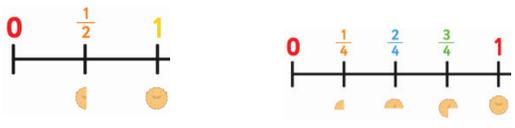
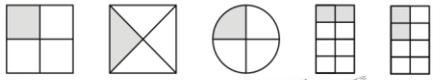
One quarter can be written as $\frac{1}{4}$

One quarter of each of these figures is shaded:



How many apples are there?
Are there more or less oranges?

Year 2.

NC Objective	Learning Objectives	Pre-learning	Methods from Calculation Policy	Key Questions for GDS
<p>Pupils should count in fractions up to 10, starting from any number and using the $\frac{1}{2}$ and $\frac{2}{4}$ equivalence on the number line.</p>	<p>Count in fractions up to 10, starting from any number and using the $\frac{1}{2}$ and $\frac{2}{4}$ equivalence on the number line.</p> <p>Vocabulary two halves two quarters, equal parts</p>	<p style="text-align: center;">Fraction Wall</p>  <p>What Can You See?</p> <p>The numerator tells us how many of these equal parts we have.</p> <p>The denominator tells us what kind of parts it is.</p> <p>(This shows how many equal parts the whole is split into.)</p>	<p>Chn should be reminded about the purposes of a number line and what it is used for. They should be given regular opportunity to use one</p> <p>They should be given the opportunity to estimate fractions using a number line.</p> 	<p>Complete the number line below</p> 
<p>recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity</p> <p>fractions of an amount</p>	<p>Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity</p> <p>Vocabulary three quarters one third, two thirds one of three quarters thirds halves</p>	<p>Counting forwards and backwards in 2's and 3's</p> <p>Use practical apparatus to show half of a given number of objects. Show they understand that halves are two equal parts.</p>  <p>Show they understand that quarters are four equal parts. One quarter can be written or</p> <p>One quarter can be written as $\frac{1}{4}$</p> <p>One quarter of each of these figures is shaded:</p>  <p>a.  b. </p>	<p>Focus on the symbols $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ and their respective words: half; quarter; three-quarters, etc.</p> <p>Play snap games to help rapid recognition.</p> <p>Show half and then quarter by taking a shape and folding it once and then again. Ensure pupils understand that one of the areas represents a half or a quarter, etc.</p> <p>Physically set out a number of items and then get pupils to show a half or a quarter of the items.</p> <p>Do the same with three-quarters and then one third before moving on to two-thirds.</p> <p>Folding a shape into 4 show pupils how one half is the same as $\frac{2}{4}$th.</p> <p>Counting $\frac{1}{4}$'s on a number line</p>  <p>Fraction wall</p> <p>1. What happens to the number</p>	<p>Look at 20 toy cars. Is it possible to find $\frac{1}{2}$, $\frac{1}{3}$ $\frac{1}{4}$ of them without breaking any of them?</p> <p>Use 3 circles, colour them in so they show $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$. Write a sentence to explain what you notice. Now colour 3 circles and colour them in so they show $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$</p> <p>Look at the 2 bars below and then complete the number sentences.</p>



of parts as you travel down the wall?
 2. What happens to the size of the parts as you travel down the wall?

$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	

is less than

is greater than

If $\frac{3}{4}$ of a number is 15, what is $\frac{1}{4}$ of the original number?

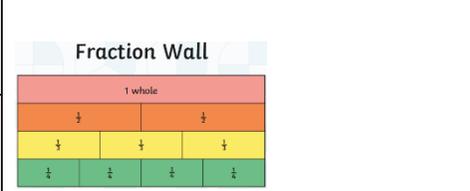
If $\frac{2}{3}$ of a number is 20, what is $\frac{1}{3}$ of the original number?

write simple fractions e.g. $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$.

Write simple fractions e.g. $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$.

Vocabulary
 Equal
 Equivalence
 Fraction
 Numerator
 Denominator
 Equal parts
 Part of a whole

Chn should understand the word 'fraction' **Part of one whole**



Chn should know how to write examples of a fraction

What Can You See?

Using practical materials emphasise how one half can be two out of 4; or 4 out of 8; etc.

Use apparatus to emphasise this. Then link this to using the symbol $\frac{1}{2}$ for all of the outcomes.

Now do the same with $\frac{1}{4}$ values. In other words, one quarter is 1 in 4; or 2 in 8; or 4 in 16, etc.

Now do the same with other fractional values such as $\frac{3}{4}$, $\frac{1}{3}$ and $\frac{2}{3}$.

Link finding $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$, $\frac{1}{3}$ etc. to measures such as length, weight and money.

Write simple fractions, e.g. $\frac{1}{2}$ of 6 = 3

14 chickens between 2 pens $\frac{1}{2}$ of 14 = 7



12 pigs between 3 pens. $\frac{1}{3}$ of 12 = 4



Here is what is left of a pizza that Byron ate.



If he had another equal piece to this left, he would have of the original pizza.

How much did he eat? Explain how you know.

A class has 24 children in it. $\frac{1}{4}$ of all the children are girls.

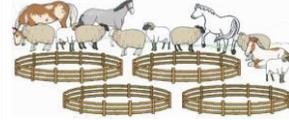
How many boys are there in the class?

There are 30 animals in a vet's surgery. Half of all the animals are dogs and a third of the animals are cats.

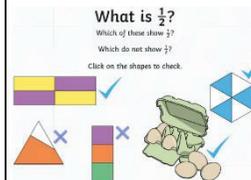
How many other animals were in the surgery?

8 sheep and 4 horses between 4 pens

$$\frac{1}{4} \text{ of } 8 = 2 \qquad \frac{1}{4} \text{ of } 4 = 1$$



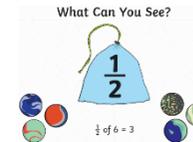
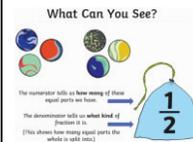
Recognise and demonstrate the equivalence of $\frac{1}{2}$ and $\frac{2}{4}$



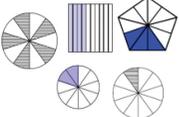
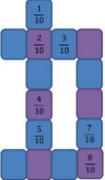
This can also be used as a diagnostic assessment

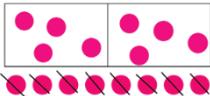
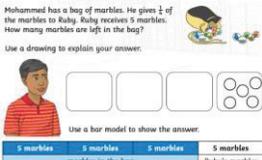
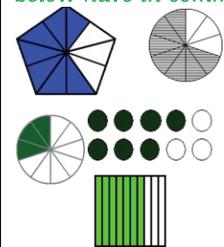
$\frac{1}{2}$ means that something has been divided into 2 equal groups and that we are interested in 1 of the groups (the part that is shaded).

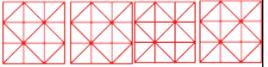
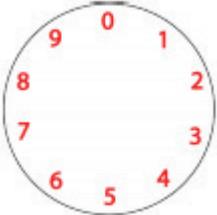
You could think of $\frac{1}{2}$ as meaning '1 group, when split into 2 equal parts'.

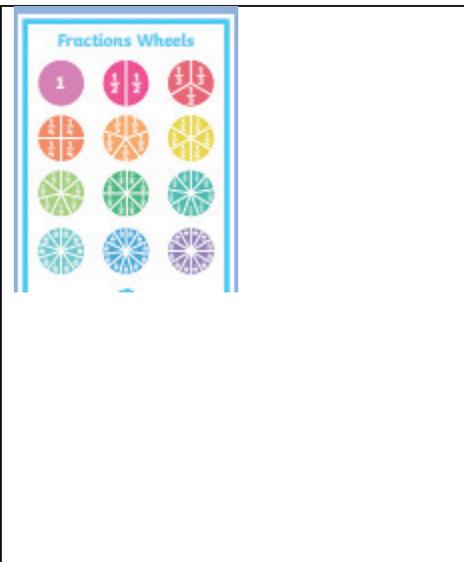
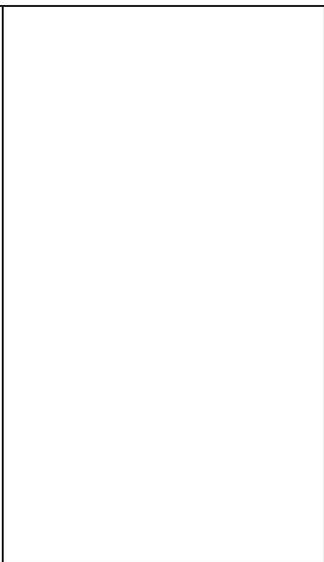
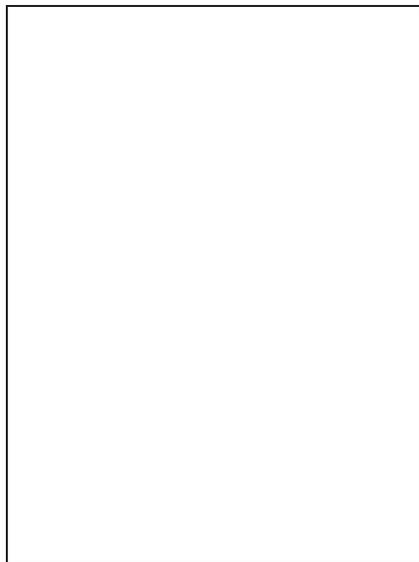


Year 3.

NC Objective	Learning Objectives	Pre-learning	Methods from Calculation Policy	Key Questions for GDS
<p>count up and down in tenths</p>	<p>Count up and down in tenth</p> <p>Vocabulary sixths, sevenths, eighths, tenths</p>	<p>Ensure pupils are familiar with the terms denominator and numerator.</p>	<p>Children should be familiar with fractions They should understand the term 'unit fraction'</p> <p>Start by chanting fractional values, eg one tenth; two tenths; etc.; then one eighth, two eighths, etc.</p> <p>They should be able to cope with moving up and down in values. Use a metre stick to help in this way.</p> <p>Move your hand up and down the metre stick as the pupils' chant.</p> <p>Finish the sequence 1/10 2/10 3/10 4/10</p>	<p>Order the diagrams and describe how you have ordered them.</p>  <p>Fill in the missing fractions</p> 
<p>recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators</p>	<p>Recognise, find and write fractions of a discrete set of objects</p> <p>Vocabulary sixths, sevenths, eighths, tenths denominators numerators</p>	<p>Chn should become familiar with fractions</p> 	<p>Write all unit fractions from $\frac{1}{2}$ to $\frac{1}{10}$ and talk to the pupils about which unit fraction has the highest value and which has the smallest value. Put the following in order from least to greatest: 3/10 4/10 5/10 6/10 7/10 8/10 9/10</p> <p>Use practical applications to show $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{10}$ values. Reinforce that $\frac{1}{2}$ is a greater value than $\frac{1}{4}$.</p> <p>Shade in one tenth of the following table. </p> <p>Shade in one quarter of the following table. </p> <p>Express $\frac{1}{2}$ as one part of two and $\frac{1}{4}$ as one part of 4, etc.</p> <p>Quarters of Objects</p> <p>Mariam has 12 cubes. She makes 4 equal sets. How many cubes are $\frac{1}{4}$ of the whole set? $\frac{1}{4}$ of 12 cubes = 3 cubes</p> <p>How many cubes are $\frac{2}{4}$ of the whole set? $\frac{2}{4}$ of 12 cubes = 6 cubes</p> 	<p>Kayleigh has 12 chocolates. On Friday, she ate $\frac{1}{4}$ of her chocolates and gave one to her mum.</p> <p>On Saturday, she ate $\frac{1}{2}$ her chocolates, and gave one to her brother.</p> <p>On Sunday, she ate $\frac{1}{3}$ of her chocolates. How many did she have left? What fraction of her starting number is this?</p> <p>I cut my pizza into 4 equal parts and I eat two of them. My friend cuts each of the remaining slices in half and eats two of them.</p>

			<p>meaning.</p> <p>Create a wall diagram that shows one whole and then one whole broken into halves; thirds, quarters, etc.</p> <p>Halves of Objects</p> <p>Ruby takes a handful of counters. How many counters are half of the whole set? $\frac{1}{2}$ of 14 counters = 7 counters</p> <p>Ruby takes another handful of counters. How many counters are half of the whole set? $\frac{1}{2}$ of 18 counters = 9 counters</p> <p>Ruby takes another handful of counters. How many counters are half of the whole set? $\frac{1}{2}$ of 26 counters = 13 counters</p> <p>Find $\frac{1}{2}$ of 8. $8 \div 2 = 4$ $\frac{1}{2}$ of 8 = 4</p>  <p>Bag of Marbles</p> <p>Mohammed has a bag of marbles. He gives $\frac{1}{2}$ of the marbles to Ruby. Ruby receives 5 marbles. How many marbles are left in the bag?</p> <p>Use a drawing to explain your answer.</p> 	<p>How much of the original pizza is left?</p>
<p>recognise that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10.</p>	<p>Recognise that tenths arise from dividing an object into 10 equal parts and in dividing one</p> <p>Vocabulary</p> <p>Tenth Sixth Fifth Thirds Eights Ninth Forth Ascending order Descending order</p>	<p>Chn should become familiar with fractions</p> 	<p>Counting up in tenths starting at any 'tenth number'</p> <p>Counting back in tenths starting at any 'tenth number'</p> <p>Knowing that tenths arise from dividing an object, quantity or number into 10 equal parts.</p> <p>Placing fractions (tenths) in order – ascending and descending.</p> 	<p>Lara has 30 cherries. On Monday she gives $\frac{1}{10}$ of the cherries to her mum and then eats 7. On Tuesday she eats $\frac{2}{10}$ of the cherries and gives 6 to her mum. On Wednesday she eats $\frac{5}{10}$ of the cherries. How many cherries does she have left?</p> <p>What do all the diagrams below have in common?</p> 

<p>recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators</p>	<p>Recognise and use fractions as numbers:</p>	<p>Chn should become familiar with fractions</p>  <p>The image shows a collection of circular fraction wheels. Each wheel is divided into equal segments and labeled with a fraction. The fractions shown include 1, 1/2, 1/3, 1/4, 1/5, 1/6, 1/8, 1/10, and 1/100.</p>		<p>Can you shade this diagram in different ways to show $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{6}$ and $\frac{1}{9}$?</p>  <p>On Sam's ninth birthday he gets a cake that has the numbers 0 - 9 round the edge instead of candles. Starting from the centre, Sam cuts the cake with three cuts into three pieces so that the numbers on each piece add up to the same total.</p> <p>What total does each piece make? What fraction of the whole cake is each piece?</p> 
<p>compare and order unit fractions, and fractions with the same denominators</p>	<p>Compare and order unit fractions, and fractions with the same denominators</p>	<p>Chn should become familiar with fractions</p>	<p>Focus on unit fractions and emphasise that they are in effect one part of the denominator, eg, $\frac{1}{6}$th is one part of six.</p> <p>Consider the values of different unit fractions and use practical methods to show their respective values.</p> <p>Use a metre rule to show the difference between $\frac{1}{5}$th and $\frac{1}{10}$th, etc.</p> <p>Look at fractions with the same denominator. Use practical methods to show the difference between</p>	<p>Using equal sized strips of paper ask children to fold them into equal parts and shade one part. With another piece of paper do the same amount of equal parts but shade 2 of them and so on. Ask them to order them and explain to each other what they can see.</p>
<p>Vocabulary Compare Numerator Denominator Unit fraction</p>				



say, $\frac{2}{5}$ th and $\frac{4}{5}$ th.

Use numbers to reinforce this by working out $\frac{2}{5}$ th of 10 and $\frac{4}{5}$ th of 10, etc.

Ordering Fractions with the Same Denominator

We are going to order these fractions with the same denominator. First, we need to put them in order. You can count according to order. A number line can help.

Try ordering these unit fractions in ascending order:

$\frac{5}{6}$	$\frac{1}{6}$	$\frac{3}{6}$
---------------	---------------	---------------

Draw a number line that is divided into 6 equal parts.

Now we can order the fractions starting with the smallest:

$\frac{1}{6}$	$\frac{3}{6}$	$\frac{5}{6}$
---------------	---------------	---------------

Ordering Unit Fractions

Try ordering these unit fractions in ascending order:

$\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{2}$
---------------	---------------	---------------	---------------

Now we can order the fractions starting with the smallest:

$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$
---------------	---------------	---------------

Create a rule as a class: when the denominator is the same, the bigger the numerator, the bigger the fraction.

Rob thinks $\frac{1}{4}$ is always the same but his teacher has asked him to find a quarter of both these amounts

a)

b)

Explain to Rob why it is not the same and create a rule with a partner.

recognise and show, using diagrams, equivalent fractions with small denominators

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

Vocabulary

Numerator
Denominator
Equal
Equivalent

Recognise and demonstrate the equivalence of $\frac{1}{2}$ and $\frac{2}{4}$

This can also be used as a diagnostic assessment

$\frac{1}{2}$ means that something has been divided into 2 equal groups and that we are interested in 1 of the groups (the part that is shaded).

You could think of $\frac{1}{2}$ as meaning '1 group, when split into 2 equal parts'.

What Can You See?

The numerator tells us how many of these equal parts we have.

The denominator tells us how many of these equal parts make up the whole.

How many equal parts does the whole in each case?

What Can You See?

$\frac{1}{2}$ of 6 = 3

Write all unit fractions from $\frac{1}{2}$ to $\frac{1}{10}$ and talk to the pupils about which unit fraction has the highest value and which has the smallest value.

Use practical applications to show $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{10}$ values. Reinforce that $\frac{1}{2}$ is a greater value than $\frac{1}{4}$. Express $\frac{1}{2}$ as one part of two and $\frac{1}{4}$ as one part of 4, etc.

Use the term 'unit fraction' with the pupils and explain its meaning.

Use the term 'non unit fraction' and explain its meaning.

Create a wall diagram that shows one whole and then one whole broken into halves; thirds, quarters, etc.

Look at the following fractions. Which fractions are the same value as $\frac{1}{2}$? Circle each one.

$\frac{2}{4}$ $\frac{4}{6}$ $\frac{5}{7}$ $\frac{6}{9}$ $\frac{3}{6}$ $\frac{5}{10}$ $\frac{8}{9}$ $\frac{9}{10}$

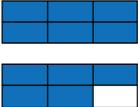
Can you work out the missing values?

$\frac{1}{2} = \frac{4 - \star}{2} \times 2$

$\frac{3}{\star} = \frac{5+1}{3+5}$

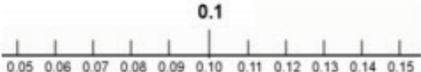
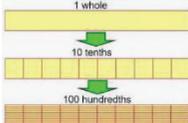
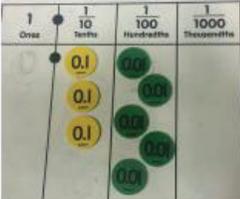
Here is a diagram that has some sections shaded

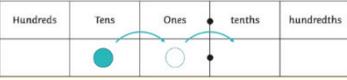
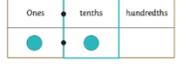
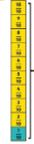
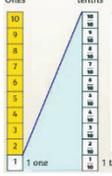
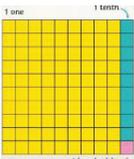
Ailish says, "I am thinking of an equivalent fraction to this where the numerator is 5." Is this possible? Explain why

			<p>Match the diagram to the equivalent fraction.</p> 	
<p>add and subtract fractions with the same denominator within one whole (e.g. $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$)</p>	<p>Add and subtract fractions with the same denominator within one whole</p> <p>Vocabulary Numerator Denominator</p> 	<p>Chn should become familiar with fractions</p>	<p>Use a large ruler segmented into 10 or 8.</p> <p>Show how one part of the ten added to 9 parts of the 10 makes one whole, then repeat for the ruler with eight segments.</p> <p>Emphasise that when dealing with the same denominator it is quite quick to work out which two parts make up the whole.</p> $\frac{2}{3} + \frac{1}{3} = \frac{3}{3} \quad \frac{2}{7} + \frac{3}{7} = \frac{5}{7}$ $\frac{7}{10} - \frac{3}{10} = \frac{4}{10} \quad \frac{7}{9} - \frac{2}{9} = \frac{5}{9}$ <p>Similarly, show how when starting with a given number of segments you are able to take away from that given number to create subtraction of fractions with the same denominator.</p>	<p>14 makes up 2/7th of the school's football squad. How many are in the full squad?</p> <p>Rick is stuck on the calculation</p> $\frac{11}{6} - \frac{3}{6} =$ <p>His friend, Susie, draws him the following model to help.</p>  <p>Susie says, "Now take away 3/6".</p> <p>Rick is confused because he thinks the diagram shows 11/12.</p> <p>Explain the diagram to Rick and work out the answer.</p>
<p>solve problems that involve all of the above</p>	<p>Solve problems that involve all of the above</p>			<p>Three pandas shared 1 bamboo stick. They split it into equal parts and each had</p>

	Vocabulary	solve problems that involve all of the above	solve problems that involve all of the above	an odd number of parts.
		RUCSAC method can also be used		<p>What are the possible fraction amounts that each panda had? Can you use a strategy or a method?</p>  <p>Raja has a number card.</p> <div style="border: 1px solid black; padding: 2px; display: inline-block;">40</div> <p>He says, "Three eighths of my number is 20." Is he correct? Explain why</p>

Year 4.

NC Objective	Learning Objectives	Pre-learning	Methods from Calculation Policy	Key Questions for GDS
count up and down in hundredths	Count up and down in hundredths <u>Vocabulary</u> hundredths decimal, decimal fraction, decimal point, decimal place, decimal equivalent proportion	Counting up in tenths starting at any 'tenth number' Counting back in tenths starting at any 'tenth number' Knowing that tenths arise from dividing an object, quantity or number into 10 equal parts. Placing fractions (tenths) in order – ascending and descending.	Explain that hundredths are created by dividing by 100. Show the hundredth value in decimal and fractional form Remind pupils of the relationship between tenths and hundredths. Pupils need to know that 10 hundredths is equivalent to one tenth.	Fill in the gaps to find the missing numbers 
recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten	Recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten <u>Vocabulary</u> As above		Use a metre stick to first show one tenth and then go on to explain the value of one hundredth.  Count up in hundredths starting at zero Count back in hundredths to zero Count up in hundredths starting at any 'hundredth number' Count back in hundredths starting at any 'hundredth number' Know that hundredths arise from dividing an object, quantity or number into 100 equal parts Place fractions (hundredths) in order – ascending and descending.  <i>The value of a given digit is one tenth of the size if it moves one place to the right on a place value grid. This is the same as dividing by 10.</i>	Amber is counting up in hundredths, she has dropped three counters. Write down the number Amber could have made and the next four numbers she would have said. <i>How many different ways can you solve the problem?</i>  Jasper says, "If I multiply ten by ten I get one hundred so if I multiply tenths by ten I get hundredths." <i>Do you agree?</i> Explain your answer; use a place value grid to help.

			 <p>One is one tenth the size of ten.</p> <p>What is one tenth the size of one? One tenth $\frac{1}{10}$</p> <p>A 1 in the tenths column has a value of one tenth, and is one tenth the size of 1 one.</p>  <p>10 tenths make 1 one.</p> <p>Although these rods usually represent a ten, you can also use them to show that each one is made up of 10 tenths.</p>   <p>1 is 10 times the size of one tenth.</p> <p>One tenth is a tenth of the size of 1.</p> <p>Now count up in tenths from one tenth.</p>  <p>1 one</p> <p>1 tenth</p> <p>1 hundredths</p> <p>Now count up in one hundredths using the counters shown in the frame.</p>  <p>1 hundredths</p> <p>$\frac{10}{100} = \frac{1}{10}$</p>									
<p>compare numbers with the same number of decimal places up to two decimal places</p>	<p>Compare numbers with the same number of decimal places up to two decimal places</p> <p>Vocabulary Decimal point Tenth Hundredths Value Compare nearest whole number One decimal place Two decimal places Round decimals</p>	<p>Recap fractions</p> <p>Recap the value of 1 on a place value chart</p> <p>Recap the value of a digit beyond the decimal point</p> <p>Concrete presentations and Pictorial presentations</p>	<p>Remind pupils about the strategy involved with rounding.</p> <p>Remind pupils about the value of decimals and remind them of the terms tenths and hundredths.</p> <p>Use a set of cards or the IWB to get pupils to respond to either rounding to the nearest whole number or to compare any two numbers with up to decimal points.</p> <p>Round a number with one decimal place to nearest whole number.</p> <p>Given 3 numbers with one decimal place, place in order (smallest to largest and vice versa).</p> <p>Given 5 numbers with one decimal place, place in order (smallest to largest and vice versa).</p> <p>Given 3 numbers with two decimal places, place in order (smallest to largest and vice versa).</p>	<p>How many different numbers with 2 decimal places can you make using the grid below and four counters? One has been done for You</p> <table border="1" data-bbox="1848 973 2094 1061"> <thead> <tr> <th>10s</th> <th>1s</th> <th>0.1s</th> <th>0.01s</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>10.12</p> <p>Can you order your numbers in descending order?</p> <p>I am a number with one decimal place. When rounded to the nearest whole number I am 25. My decimal digit is 7.</p>	10s	1s	0.1s	0.01s				
10s	1s	0.1s	0.01s									
												

			<p>Given 5 numbers with two decimal places, place in order (smallest to largest and vice versa). What are the integers at the start and end of this number line?</p>  <p>Use the number lines and statements to describe how the numbers are rounded.</p>  <p>2.3 is closer to <input type="text" value="2"/> than <input type="text" value="3"/>.</p> <p>2.3 rounds to <input type="text" value="2"/> to the nearest whole number.</p> <p>2.7 is closer to <input type="text" value="3"/> than <input type="text" value="2"/>.</p> <p>2.7 rounds to <input type="text" value="3"/> to the nearest whole number.</p>	<p>What is my number?</p> <p>I am a number between 20 and 30 with one decimal place.</p> <p>When the digits of my rounded number are added together it makes 9.</p> <p>My decimal digit is 5.</p> <p>What is my number?</p>
round decimals with one decimal place to the nearest whole number	Round decimals with one decimal place to the nearest whole number	As above		<p>We are two numbers with each having 2 decimal places.</p> <p>We are both between 20 and 29.</p> <p>When adding all our 4 digits together both of us add up 12.</p> <p>We have the same ones value.</p> <p>What could our two number be?</p> <p>There may be more than one answer.</p>
	<p><u>Vocabulary</u></p> <p>As above</p>			
recognise and show, using diagrams, families of common equivalent fractions	Recognise and show, using diagrams, families of common equivalent fractions	Use practical applications to show $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{10}$ values. Reinforce that $\frac{1}{2}$ is a greater value than $\frac{1}{4}$.	Use metre sticks that have been divided into 2; 4; and 8 and show how $\frac{1}{2}$ on one is the same as $\frac{2}{4}$ and $\frac{4}{8}$ on the other two.	Print the square below several times on a s Sheet. Children investigate

Vocabulary
 equivalent fraction
 mixed number
 numerator,
 denominator

Express $\frac{1}{2}$ as one part of two and $\frac{1}{4}$ as one part of 4, etc.

Use the term 'unit fraction' with the pupils and explain its meaning.

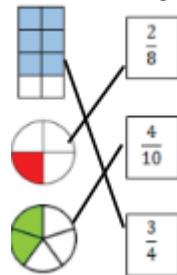
Use the term 'non-unit fraction' and explain its meaning.

Create a wall diagram that shows one whole and then one whole broken into halves; thirds, quarters, etc.

Look at the following fractions. Which fractions are the same value as $\frac{1}{2}$? Circle each one.

$\frac{2}{4}$ $\frac{4}{6}$ $\frac{5}{7}$ $\frac{6}{9}$ $\frac{3}{6}$ $\frac{5}{10}$ $\frac{8}{9}$ $\frac{9}{10}$

Match the diagram to the equivalent fraction.

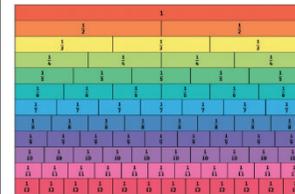


Now do the same with divisions of 3; 6; 9; and 12.

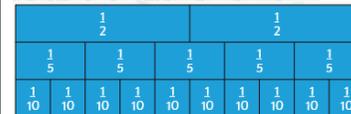
Take pupils through the number of ways that $\frac{1}{2}$ could be shown, and the $\frac{1}{4}$ and then $\frac{1}{8}$.

Take pupils through the idea that if the denominator is twice the numerator then the fraction is equivalent to $\frac{1}{2}$. If the denominator is four times the numerator then the fraction is equivalent of a $\frac{1}{4}$, etc.

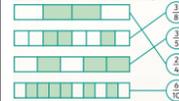
Fraction wa



Equivalent means 'equal to' or 'the same'. The images representing 5 are equivalent because they show the same value.

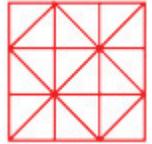


Bar model representing fractions



the different ways they can show

$\frac{1}{2}$, $\frac{1}{4}$ 1/3 1/6



Use the digit cards to fill in the boxes below

1 1 2 3

5 5 6



recognise and write decimal equivalents of any number of tenths or hundredths

Recognise and write decimal equivalents of any number of tenths or hundredths

recognise and write decimal equivalent for to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$

Show half and then quarter by taking a shape and folding it once and then again. Ensure pupils understand that one of the areas represents a half or a quarter, etc

Use 2 metre sticks and show how to divide each up into 10 equal pieces.

On the first show the value of each piece by fraction, ie, $1/10^{\text{th}}$

On the second show the value of each piece by

Use the five digit cards to complete the statement below

recognise and write decimal equivalent for to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$

Vocabulary

- Decimal
- Decimal equivalent
- Half
- Quarter
- Three quarter
- Tenth
- Hundredth

Show concrete and pictorial representations of fractions 1/10 to 9/10

Understand a decimal point

A decimal point is a point or dot used to separate the whole part of a number from the fractional part of a number.

decimal fraction 0.1

0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
$\frac{1}{10}$	$\frac{2}{10}$	$\frac{3}{10}$	$\frac{4}{10}$	$\frac{5}{10}$	$\frac{6}{10}$	$\frac{7}{10}$	$\frac{8}{10}$	$\frac{9}{10}$	$\frac{10}{10}$

Show other equivalents, such as, $0.3 = 3/10$ th etc.

Know that 0.5 is not just 5/10th but also $\frac{1}{2}$ and that $\frac{1}{4}$ lies between 0.2 and 0.3 and is equivalent to 0.25.

Similarly, $\frac{3}{4}$ is 0.75.

Know that $1/10 = 0.1$ [for each tenth value]

Know that $1/100 = 0.01$ [for each hundredth value]

0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	1.0
$\frac{1}{100}$	$\frac{2}{100}$	$\frac{3}{100}$	$\frac{4}{100}$	$\frac{5}{100}$	$\frac{6}{100}$	$\frac{7}{100}$	$\frac{8}{100}$	$\frac{9}{100}$	$\frac{10}{100}$

Know that $0.25 = \frac{1}{4}$

Know that $0.5 = \frac{1}{2}$

Know that $0.75 = \frac{3}{4}$

0 0 1 6 6

$\frac{\square}{\square} = \square \cdot \square$

Fill in the missing numbers below so the fractions and decimals are equivalent in each row of the table.

One has been done for you

Fraction	Decimal
$\frac{35}{100}$	0.35
$\frac{4}{100}$	0.2_
$\frac{\quad}{10}$	_ .4
$\frac{50}{\quad}$	0. _

Use the number cards 0 - 5 below to complete the number sentence

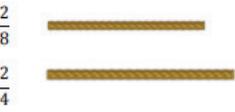
$\frac{\square}{\square} = \square \cdot \square$

Harry has written the decimal equivalents to a half and a quarter. Can you explain to him what he has done wrong?

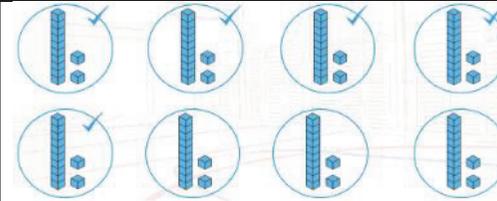
What could you use to show him?

Harry: $\frac{1}{2} = 1.2$

$\frac{1}{4} = 1.4$

<p>add and subtract fractions with the same denominator</p>	<p>Add and subtract fractions with the same denominator</p> <p>Vocabulary Denominator Numerator</p>	<p>Use a large ruler segmented into 10 or 8.</p> <p>Show how one part of the ten added to 9 parts of the 10 makes one whole, then repeat for the rule with eight segments.</p> <p>Emphasise that when dealing with the same denominator it is quite quick to work out which two parts make up the whole.</p> $\frac{2}{3} + \frac{1}{3} = \frac{3}{3} \quad \frac{2}{7} + \frac{3}{7} = \frac{5}{7}$ $\frac{7}{10} - \frac{3}{10} = \frac{4}{10} \quad \frac{7}{9} - \frac{2}{9} = \frac{5}{9}$	<p>Remind pupils of the terms numerator and denominator.</p> <p>Express denominator as 'part of' and remind them that one tenth is one part of 10 equal pieces</p> <p>Put a set of cards, with fractional values but with same denominator in order.</p> <p>Make up one whole by adding two fractional vales together with the same denominator, eg, $\frac{4}{5} + \frac{1}{5}$</p> <p>Using fractions with the same denominator get pupils to add two fractional values that come to more than 1 whole.</p> <p>Add</p> $\frac{2}{3} + \frac{1}{3} = \frac{3}{3} \quad \frac{2}{7} + \frac{3}{7} = \frac{5}{7}$ <p>Take away</p> $\frac{7}{10} - \frac{3}{10} = \frac{4}{10} \quad \frac{7}{9} - \frac{2}{9} = \frac{5}{9}$	<p>Caroline chooses two fractions and subtracts the smaller one from the bigger one. Her answer was $\frac{1}{6}$</p> <p>What fractions could Caroline have chosen? How many ways can you find to do it?</p> <p>Dan has 2 pieces of rope. One is $\frac{2}{8}$ of the whole rope and one is $\frac{2}{4}$ Dan adds $\frac{4}{8}$ to the first rope and $\frac{1}{4}$ to the second rope. Which rope is longer? Do you notice anything about the lengths of the ropes?</p> 
<p>find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths</p>	<p>Find the effect of dividing a one- or two-digit number by 10 and 100</p> <p>Vocabulary Decimal Decimal equivalent Tenth Hundredth</p>	<p>Show concrete and pictorial representations of fractions $\frac{1}{10}$ to $\frac{9}{10}$</p> <p>Understand a decimal point A decimal point is a point or dot used to separate the whole part of a number from the fractional part of a number.</p>	<p>Work with pupils with understanding ones; tenths and hundreds.</p> <p>Physically show pupils what happens when you divide 1 by 10.</p> <p>Explain how that is recorded as 0.1 using the matrix to show pupils exactly what has happened</p> <p>Do this with other one-digit numbers so that they recognise $2 \div 10$ is 0.2.</p> <p>Now take 0.1 and divide that by 10 and make pupils confident about the use of the hundredths column.</p> <p>$1 \div 100 = 0.01$. Help pupils understand how this</p>	<p>Paul has multiplied a number by 100. Her answer is between 40 and 45. What number could she have multiplied? How many possibilities can you find?</p> <p>True or False A two-digit number divided by 10 always gives an answer with one decimal place. E.g. $52 \div 10 = 5.2$ Prove it</p>

			<p>is recorded. Then divide 2 by 100, etc. Use place value to explain how to divide one or two-digit numbers by 100. Explain how to calculate $47 \div 100 =$ using place value.</p> <p>When dividing a number by 100, the answer can be found by moving the digits two place values to the right, making the number smaller.</p> <table border="1" data-bbox="1294 416 1675 512"> <thead> <tr> <th>Tens</th> <th>Ones</th> <th>Tenths</th> <th>Hundredths</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>7</td> <td></td> <td></td> </tr> <tr> <td></td> <td>4</td> <td>. 7</td> <td></td> </tr> <tr> <td></td> <td>0</td> <td>. 4</td> <td>7</td> </tr> </tbody> </table> <p>Remember to include a 0 in the ones column when the number is less than 1 (leading zero).</p>	Tens	Ones	Tenths	Hundredths	4	7				4	. 7			0	. 4	7	<p>Working Backwards</p> <p>I divide a number by 10 and the answer is 0.3. What number did I start with?</p> <p>I divide a number by 100 and the answer is 0.3. What was the number in the first place?</p> <p>I divide a number by 10 and the answer is 6.2. What number did I start with?</p> <p>I divide a number by 100 and the answer is 6.2. What number did I start with?</p>
Tens	Ones	Tenths	Hundredths																	
4	7																			
	4	. 7																		
	0	. 4	7																	
<p>solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number</p>	<p>Solve problems involving increasingly harder fractions to calculate quantities.</p> <p>Vocabulary Quantities Divide multiply Non-unit fraction Denominator Numerator</p>	<p>Focus on the symbols $1/3$, $1/4$, $2/4$, $1/2$, $3/4$ and their respective words: half; quarter; three-quarters, etc.</p> <p>Play snap games to help rapid recognition.</p> <p>Show half and then quarter by taking a shape and folding it once and then again. Ensure pupils understand that one of the areas represents a half or a quarter, etc.</p> <p>Recap the concept of multiplying and dividing</p>	<p>Revisit the RUCSAC method of solving word problems</p> <p>Ensure children are secure with the four operations. Encourage them to choose and use the easiest method of working out a calculation</p> <p>Laura draws a bar to represent the number 16.</p>  <p>Write an explanation of how she can use this to calculate $\frac{1}{4}$ of 16. Share with a partner and make improvements to your explanation.</p> <p>Divide the bar into 4 equal parts. Each part will represent 4. One part will represent $\frac{1}{4}$. $\frac{1}{4}$ of 16 = 4</p>  <p>Use this pictorial representation to demonstrate finding the fraction of a quantity.</p>	<p>These three squares are $\frac{1}{4}$ of a whole shape.</p>  <p>How many different shapes can you draw that could be the complete shape?</p> <p>Jenny has 42 stickers. She gives $\frac{2}{7}$ of her stickers to Paul and $\frac{2}{6}$ of her stickers to Beth.</p> <p>How many stickers do they each have?</p>																



$$5/8 \text{ of } 96 = 60$$

Draw this bar model to find and represent:



You can start introducing the concept of dividing the amount by the denominator then multiplying the answer by the numerator.

$$\frac{2}{4} \text{ of } 36 = 18 \quad \begin{array}{l} 36 \div 4 = 9 \\ 9 \times 2 = 18 \end{array}$$

solve simple measure and money problems involving fractions and decimals to two decimal places.

Solve simple measure and money problems involving fractions and decimals to two decimal places.

Vocabulary
 Decimal place
 Amount saved
 Amount spent

Recap

What fraction and decimal fraction of £1 is each of the following coins.

1p	£0.01 and $\frac{1}{100}$ of £1
2p	£0.02 and $\frac{1}{50}$ or $\frac{2}{100}$ of £1
5p	£0.05 and $\frac{1}{20}$ or $\frac{5}{100}$ of £1
10p	£0.10 and $\frac{1}{10}$ or $\frac{10}{100}$ of £1
20p	£0.20 and $\frac{1}{5}$ or $\frac{20}{100}$ of £1
50p	£0.50 and $\frac{1}{2}$ or $\frac{50}{100}$ of £1

Help pupils look for key words within the word problems, eg altogether, fewer, etc.

Take them through the process of reading the question and getting them to explain what they think they have to do to a partner.

Pupils' basic skills will need to be good enough once they have understood the problem.

It is important that they can work out if the step they are looking at is an addition, subtraction, or indeed multiplication or division.

Tia has £24. She puts $\frac{1}{3}$ of this money into a savings account

How much does she save? How much money does she have left?

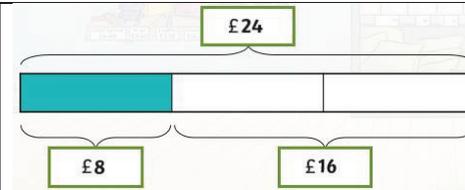
This bar model will help you calculate the answer.

Kim bought a chocolate bar and a drink. The cost of them both together is in one of the boxes below

£1.85	75p	£1.56
£1.74	£2.25	£1.00
£1.80	80p	£2.10
£1.44	£3.06	£1.50
£1.20	£1.25	£1.60
£1.45	90p	£1.27

Using these five clues can you work out which price in the boxes is correct?

1. You need more than three coins to make this



Tia saved £8.
Tia had £16 left.

Here are the costs for entry to the zoo.

Adult	£6
Child	£4.30

How much does it cost for 1 adult and 2 children?

$$£6 + £4.30 + £4.30 = £14.60$$

How much change would they get from £20?

$$£20 - £14.60 = £5.40$$

amount.

2. There would be change when using the most valuable coin to buy them.
3. The chocolate bar cost more than 50p
4. You could pay without using any copper coins
5. The chocolate bar cost exactly half the amount of the drink.

Year 5.

NC Objective	Learning Objectives	Pre-learning	Methods from Calculation Policy	Key Questions for GDS																																																																								
<p>recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents</p>	<p>Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents</p> <p style="color: green; text-decoration: underline;">Vocabulary</p> <p style="padding-left: 20px;">fraction equivalent, tenth, hundredth, thousandths</p>	<p>On the first show the value of each piece by fraction, ie, 1/10th</p> <p>On the second show the value of each piece by decimal fraction 0.1</p> <table border="1" style="margin: 10px auto; text-align: center; font-size: small;"> <tr><th>0.1</th><th>0.2</th><th>0.3</th><th>0.4</th><th>0.5</th><th>0.6</th><th>0.7</th><th>0.8</th><th>0.9</th><th>1.0</th></tr> <tr><td>$\frac{1}{10}$</td><td>$\frac{2}{10}$</td><td>$\frac{3}{10}$</td><td>$\frac{4}{10}$</td><td>$\frac{5}{10}$</td><td>$\frac{6}{10}$</td><td>$\frac{7}{10}$</td><td>$\frac{8}{10}$</td><td>$\frac{9}{10}$</td><td>$\frac{10}{10}$</td></tr> </table> <p>Show other equivalents, such as, 0.3 = 3/10th etc.</p> <p>Know that 0.5 is not just 5/10th but also $\frac{1}{2}$ and that $\frac{1}{4}$ lies between 0.2 and 0.3 and is equivalent to 0.25.</p> <p>Similarly, $\frac{3}{4}$ is 0.75.</p> <p>Know that 1/10 = 0.1 [for each tenth value]</p> <p>Know that 1/100 = 0.01 [for each hundredth value]</p> <table border="1" style="margin: 10px auto; text-align: center; font-size: x-small;"> <tr><th>0.01</th><th>0.02</th><th>0.03</th><th>0.04</th><th>0.05</th><th>0.06</th><th>0.07</th><th>0.08</th><th>0.09</th><th>1.0</th></tr> <tr><td>$\frac{1}{100}$</td><td>$\frac{2}{100}$</td><td>$\frac{3}{100}$</td><td>$\frac{4}{100}$</td><td>$\frac{5}{100}$</td><td>$\frac{6}{100}$</td><td>$\frac{7}{100}$</td><td>$\frac{8}{100}$</td><td>$\frac{9}{100}$</td><td>$\frac{10}{100}$</td></tr> </table>	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	$\frac{1}{10}$	$\frac{2}{10}$	$\frac{3}{10}$	$\frac{4}{10}$	$\frac{5}{10}$	$\frac{6}{10}$	$\frac{7}{10}$	$\frac{8}{10}$	$\frac{9}{10}$	$\frac{10}{10}$	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	1.0	$\frac{1}{100}$	$\frac{2}{100}$	$\frac{3}{100}$	$\frac{4}{100}$	$\frac{5}{100}$	$\frac{6}{100}$	$\frac{7}{100}$	$\frac{8}{100}$	$\frac{9}{100}$	$\frac{10}{100}$	<p>Explain that thousandths are created by dividing by 1000.</p> <p>Show the thousandths value in decimal and fractional form</p> <table border="1" style="margin: 10px auto; text-align: center; font-size: x-small;"> <tr><th>0.001</th><th>0.002</th><th>0.003</th><th>0.004</th><th>0.005</th><th>0.006</th><th>0.007</th><th>0.008</th></tr> <tr><td>1/1000</td><td>2/1000</td><td>3/1000</td><td>4/1000</td><td>5/1000</td><td>6/1000</td><td>7/1000</td><td>8/1000</td></tr> </table> <p>Remind pupils of the relationship between tenths, hundredths and thousandths.</p> <p>Pupils need to know that 100 thousandths is equivalent to one tenth and that 10 thousandths is equivalent to one hundredth.</p> <p>Use a metre stick to first show one tenth and then go on to explain the value of one hundredth and then one thousandths.</p> <p style="color: red; text-align: center;">Tenth Hundredth</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p style="font-size: x-small;">Any digit immediately to the right of the decimal point is a tenth. 1 = $\frac{10}{10}$</p> </div> <div style="text-align: center;"> <p style="font-size: x-small;">Any digit immediately to the right of the tenth column is a hundredth. 1 = $\frac{10}{10} = \frac{100}{100}$</p> </div> </div> <p style="color: red; text-align: center;">Thousandths</p> <div style="text-align: center;"> <p style="font-size: x-small;">Any digit immediately to the right of the hundredth column is a thousandth. 1 = $\frac{10}{10} = \frac{100}{100} = \frac{1000}{1000}$</p> </div> <p style="font-size: x-small; text-align: center;">Each place value column gets 10 times smaller.</p> <div style="text-align: center;"> </div>	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	1/1000	2/1000	3/1000	4/1000	5/1000	6/1000	7/1000	8/1000	<p>In this problem decimal numbers have been replaced with symbols. What is the value in each box if:</p> <p>$\frac{1}{10} =$ ★</p> <p>$\frac{1}{100} =$ ▲</p> <p>$\frac{1}{1000} =$ ■</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <table style="width: 100%; text-align: center; font-size: small;"> <tr><td>■</td><td>▲</td><td>▲</td><td>▲</td><td>★</td><td>★</td><td>★</td><td>★</td></tr> <tr><td>★</td><td>▲</td><td>■</td><td>■</td><td>★</td><td>★</td><td>■</td><td>■</td></tr> </table> </div> <p>More than.....Less than</p> <ul style="list-style-type: none"> Write a decimal fraction that is less than 0.01 but more than 0.001. Now write its fractional equivalent. Write a decimal fraction that is less than 0.21 but more than 0.03. Now write its fractional equivalent. Write a decimal fraction that is less than 0.05 but more than 0.039. Now write its fractional equivalent. 	■	▲	▲	▲	★	★	★	★	★	▲	■	■	★	★	■	■
0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0																																																																			
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compare and order fractions whose denominators are all multiples of the same number

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

Vocabulary
 Multiples
 Numerator
 Denominator
 Multiples of the same number

Look at fractions with the same denominator. Use practical methods to show the difference between say, $\frac{2}{5}$ th and $\frac{4}{5}$ th.

Use numbers to reinforce this by working out $\frac{2}{5}$ th of 10 and $\frac{4}{5}$ th of 10, etc.

Help pupils to make sets of multiples, eg, 2, 4, 8 and 16; 3, 6, 9 and 12.

You can use two metre sticks, one with 8 divisions and one with 4 divisions.

Show pupils visually how four eighths is the same as two fourths.

Then do the same with 2 metre sticks with divisions of three and six.

Show pupils how to change a fraction in thirds to one with sixths or ninths.

Compare and order fractions with the same denominator.

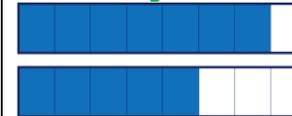
Compare and order fractions with denominators of 2, 4, 8,5,10.

Convert fractions with different denominators to have a common denominator.

Order two different fractions with different denominators that are multiples of the same number.

Order more than two different fractions with different denominators that are multiples of the same number.

Which is larger: $\frac{7}{8}$ or $\frac{5}{8}$? $\frac{7}{8}$



Which fraction is larger: $\frac{2}{3}$ or $\frac{4}{5}$?

$$\frac{2}{3} = \frac{10}{15} \quad \frac{4}{5} = \frac{12}{15}$$

When one denominator is not a multiple of another, you need to convert both fractions.

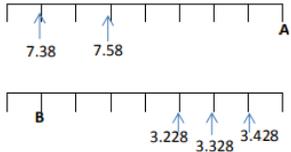
15 is a multiple of both 3 and 5, so we can find two equivalent fractions with a denominator of 15.

Cut out lots of different fractions. Ask children in pairs to sort them into equivalent piles. Ask children to record three more fractions- an equivalent fraction, a bigger fraction and a smaller fraction.

Fraction problems

Tom ate $\frac{11}{16}$ of his pizza and Helen ate $\frac{7}{8}$ of hers. Which of the two had more pizza?

Lizzie managed to complete $\frac{3}{4}$ of her exam paper and Tony managed $\frac{7}{8}$. Who did the most?

<p>read, write, order and compare numbers with up to three decimal places</p>	<p>Read, write, order and compare numbers with up to three decimal places</p> <p>Vocabulary Compare 2 decimal places One decimal place Three decimal places</p>	<p>Remind pupils about the value of decimals and remind them of the terms tenths and hundredths.</p> <p>Use a set of cards or the IWB to get pupils to respond to either rounding to the nearest whole number or to compare any two numbers with up to decimal points</p>	<p>Get pupils to compare numbers and order them using practical methods.</p> <p>For example a group of 4 to 6 pupils could be given a number each and they have to organise themselves by highest first, etc.</p>	<p>Here are two number lines</p>  <p>Find the difference between the letters A and B.</p> <p>2 numbers have the difference of 1.427 and one of the numbers is 3.665 What is the other number? Are these the only possible numbers?</p>
<p>round decimals with two decimal places to the nearest whole number and to one decimal place</p>	<p>Round decimals with two decimal places to the nearest whole number and to one decimal place</p> <p>Vocabulary 2 decimal places One decimal place Three decimal places ...nearest whole number</p>		<p>Remind pupils of the principles related to rounding.</p> <p>Explain that the same applies to rounding decimals.</p> <p>Provide pupils with cards that have numbers with up to 2 decimal places on them and verbally get pupils to round the numbers to the nearest whole number or to the nearest one decimal place.</p> <p>Remind pupils of the work already done with decimal numbers and reiterate the value of tenths; hundredths, etc.</p>	<p>3.7 is the 8th number in the sequence and 3.5 was the 4th in the sequence. What was the first number?</p> <p>Use 3 10-sided dice (0-9) to create a decimal number to 2 decimal places.</p>  <p>Round this number to the nearest tenth. Are there any other decimal numbers you can make from these 3 digits? Do they round to the same tenth? What 3 numbers could you roll where more than 1 of the numbers would round to the same tenth? Why does this work?</p>
<p>identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths</p>	<p>Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths</p>	<p>Recap The denominator is the bottom number in a fraction.</p> <p>It shows how many equal parts the whole is</p>	<p>Use squared paper and circles to show how equivalent fractions work.</p> <p>Use the metre stick again with different divisions, ie, 8; 10; 5; 4; 6 and 3.</p>	<p>Find the value of the symbol ★</p> $\frac{1}{2} = \frac{1+5}{2+★}$ <p>Here are some fraction cards. All of</p>

Vocabulary
 Equivalent
 Equivalent fraction
 Tenth
 Hundredth
 Multiply divide
 Simplify
 Simplest form
 Common denominator

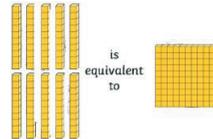
divided into. In this fraction, the whole is divided into 5 equal parts.

Recap

What fraction of each diagram is shaded? Does each diagram show the given fraction? Explain your answers.

Recap
Equivalent
 means
 the
 same
 value or
 amount.

Here are some maths examples.



Recap times table

Establish the relationship between thirds and sixths; quarters and eighths and tenths and fifths.

Using the metre sticks look at the similarities between fractions and decimal fractions.

Identify equivalent fractions for $\frac{?}{3}$

Identify equivalent fractions for $\frac{?}{4}$

Identify equivalent fractions for $\frac{?}{10}$

Identify equivalent fractions for $\frac{?}{100}$

Some equivalent fractions of $\frac{1}{2}$.

Here is a fraction bar divided into two equal parts. Each part is $\frac{1}{2}$. $\frac{1}{2}$ is equivalent to



Here is the same size fraction bar divided into four equal parts. Each part is $\frac{1}{4}$.

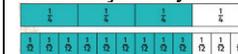


The whole is divided into 2 equal parts and 1 of those parts is shaded.

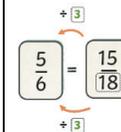
The whole is divided into 4 equal parts and 2 of those parts are shaded.

$\times 2 \left(\frac{1}{2} = \frac{2}{4} \right) \times 2$ The denominator is two times greater than the numerator. The numerator and denominator for equivalent fractions of $\frac{1}{2}$ always have this relationship.

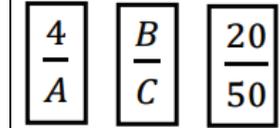
Chn should be able to multiply and divide in order to find equivalent fractions



Chn should also practice the division and become used to the term simplify.

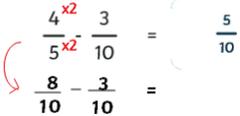


the fractions are equal.



A + B = 16

Work out the value of C

<p>read and write decimal numbers as fractions (e.g. $0.71 = \frac{71}{100}$)</p>	<p>Read and write decimal numbers as fractions (e.g. $0.71 = \frac{71}{100}$)</p> <p>Vocabulary</p> <p>As above</p>	<p>As above</p>	<p>Write 0.5; 0.25; 0.1 as fractions</p> <p>Write any decimal with 1 decimal place as a fraction</p> <table border="1" data-bbox="1227 288 1688 363"> <tr><th>0.1</th><th>0.2</th><th>0.3</th><th>0.4</th><th>0.5</th><th>0.6</th><th>0.7</th><th>0.8</th><th>0.9</th><th>1.0</th></tr> <tr><td>$\frac{1}{10}$</td><td>$\frac{2}{10}$</td><td>$\frac{3}{10}$</td><td>$\frac{4}{10}$</td><td>$\frac{5}{10}$</td><td>$\frac{6}{10}$</td><td>$\frac{7}{10}$</td><td>$\frac{8}{10}$</td><td>$\frac{9}{10}$</td><td>$\frac{10}{10}$</td></tr> </table> <p>Write any decimal with 2 decimal places as a fraction</p> <table border="1" data-bbox="1227 435 1688 510"> <tr><th>0.01</th><th>0.02</th><th>0.03</th><th>0.04</th><th>0.05</th><th>0.06</th><th>0.07</th><th>0.08</th><th>0.09</th><th>1.0</th></tr> <tr><td>$\frac{1}{100}$</td><td>$\frac{2}{100}$</td><td>$\frac{3}{100}$</td><td>$\frac{4}{100}$</td><td>$\frac{5}{100}$</td><td>$\frac{6}{100}$</td><td>$\frac{7}{100}$</td><td>$\frac{8}{100}$</td><td>$\frac{9}{100}$</td><td>$\frac{10}{100}$</td></tr> </table>	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	$\frac{1}{10}$	$\frac{2}{10}$	$\frac{3}{10}$	$\frac{4}{10}$	$\frac{5}{10}$	$\frac{6}{10}$	$\frac{7}{10}$	$\frac{8}{10}$	$\frac{9}{10}$	$\frac{10}{10}$	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	1.0	$\frac{1}{100}$	$\frac{2}{100}$	$\frac{3}{100}$	$\frac{4}{100}$	$\frac{5}{100}$	$\frac{6}{100}$	$\frac{7}{100}$	$\frac{8}{100}$	$\frac{9}{100}$	$\frac{10}{100}$	<table border="1" data-bbox="1753 196 2092 454"> <thead> <tr><th colspan="2">Which of these pairs is closer to 1?</th><th rowspan="2">Answer</th></tr> </thead> <tbody> <tr><td>0.9</td><td>7/10</td></tr> <tr><td>7/8</td><td>19/24</td></tr> <tr><td>0.2</td><td>1/4</td></tr> <tr><td>7/9</td><td>17/18</td></tr> <tr><td>0.75</td><td>0.8</td></tr> <tr><td>0.35</td><td>1/3</td></tr> <tr><td>0.15</td><td>3/10</td></tr> </tbody> </table> <p>Play decimal and fraction Dominoes</p> <table border="1" data-bbox="1753 555 1977 743"> <tr><td>0.1</td><td>$\frac{30}{100}$</td><td>0.3</td><td>$\frac{75}{100}$</td></tr> <tr><td>$\frac{1}{10}$</td><td></td><td></td><td></td></tr> <tr><td>0.64</td><td></td><td></td><td></td></tr> </table> <p>The green rectangle has a perimeter $22\frac{4}{4}$ of Work out the value of x</p>  <p>Joey eats $\frac{1}{3}$ of a cake. Ross says, "That means I have $\frac{7}{9}$ left to eat."</p> <p>Do you agree? Explain why.</p>	Which of these pairs is closer to 1?		Answer	0.9	7/10	7/8	19/24	0.2	1/4	7/9	17/18	0.75	0.8	0.35	1/3	0.15	3/10	0.1	$\frac{30}{100}$	0.3	$\frac{75}{100}$	$\frac{1}{10}$				0.64			
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<p>add and subtract fractions with the same denominator and multiples of the same number</p>	<p>Add and subtract fractions with the same denominator and multiples of the same number</p> <p>Vocabulary</p> <p>Denominator Multiples Numerator Common denominator</p>	<p>Remind pupils of the terms numerator and denominator.</p> <p>Express denominator as 'part of' and remind them that one tenth is one part of 10 equal pieces</p> <p>Put a set of cards, with fractional values but with same denominator in order.</p> <p>Make up one whole by adding two fractional vales together with the same denominator, eg, $\frac{4}{5} + \frac{1}{5}$</p> <p>Using fractions with the same denominator get pupils to add two fractional values that come to more than 1 whole.</p> <p>Add</p> $\frac{2}{3} + \frac{1}{3} = \frac{3}{3} \quad \frac{2}{7} + \frac{3}{7} = \frac{5}{7}$ <p>Take away</p> $\frac{7}{10} - \frac{3}{10} = \frac{4}{10} \quad \frac{7}{9} - \frac{2}{9} = \frac{5}{9}$	<p>Remind pupils of the terms numerator and denominator.</p> <p>Express denominator as 'part of' and remind them that one tenth is one part of 10 equal pieces</p> <p>Add</p> $\frac{1}{2} + \frac{1}{4} = \frac{2}{4} + \frac{1}{4} = \frac{3}{4} \quad \frac{5}{8} + \frac{1}{4} = \frac{5}{8} + \frac{2}{8} = \frac{7}{8}$  <p>Take away</p> $\frac{4}{5} - \frac{3}{5} = \frac{1}{5} \quad \frac{8}{10} - \frac{3}{10} = \frac{5}{10}$ 																																																																						

recognise mixed numbers and improper fractions and convert from one form to the other e.g > 1 as a mixed number (e.g. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$)

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None

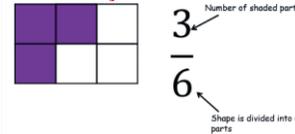
Vocabulary
 Proper fraction
 Improper fraction
 Mixed number
 Convert

Begin by using a metre stick which can be divided into equal parts. Start with four parts. Emphasise that 4 parts of 4 is one whole and can be expressed as 4/4. Similarly, 6 parts of 6 is 6/6, etc.

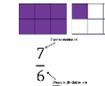
Establish understanding of the numerator and denominator. The denominator is the parts it has been divided into and the numerator is the number of those parts you have. In this way pupils should see that 6 parts of 4 is one and 2 fourths or one and a half.

Ensure pupils know the terms improper and mixed fractions.

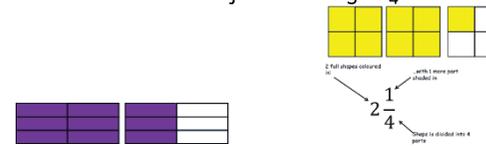
What is a fraction?



Improper fraction- An improper fraction where the numerator (top number) is bigger than the denominator (bottom number) e.g 7/6 and 11/3



Mixed number -A mixed number is made of a whole number and a fraction. E.g $2\frac{1}{4}$



$\frac{3}{6}$ is the same as $\frac{9}{18}$

Mixed number to improper fraction

$$1\frac{3}{6} = \frac{6 \times 1 + 3}{6} = \frac{9}{6}$$

Improper fraction to mixed number

$$\frac{16}{5} = 3\frac{1}{5}$$

This number becomes the numerator
 $16 \div 5 = 3$ remainder 1
 The bottom number always stays the same

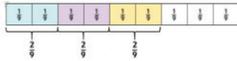
For the school's sports day, a group of students prepared $21\frac{1}{2}$ litres of lemonade. At the end of the day they had $2\frac{5}{8}$ litres left over.

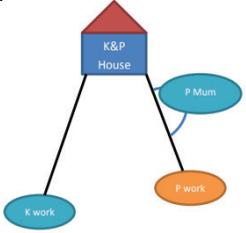
How many litres of lemonade were sold?



If they sold the lemonade in 125ml glasses, which they sold at 30p each, how many glasses did they sell and how much did they make?



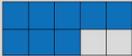
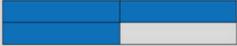
			<table border="1"> <thead> <tr> <th>Improper Fraction</th> <th>Fraction Diagram</th> <th>Mixed Number</th> </tr> </thead> <tbody> <tr> <td>$\frac{5}{3}$</td> <td></td> <td>$1\frac{2}{3}$</td> </tr> <tr> <td>$\frac{7}{4}$</td> <td></td> <td>$1\frac{3}{4}$</td> </tr> <tr> <td>$\frac{8}{5}$</td> <td></td> <td>$1\frac{3}{5}$</td> </tr> </tbody> </table>	Improper Fraction	Fraction Diagram	Mixed Number	$\frac{5}{3}$		$1\frac{2}{3}$	$\frac{7}{4}$		$1\frac{3}{4}$	$\frac{8}{5}$		$1\frac{3}{5}$	
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multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	<p>Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams</p> <p><u>Vocabulary</u> Proper fraction Mixed number</p>	<p>Ensure chn understand the concept of multiplying. Use pictorial concepts to help chn understand and work out each calculation.</p> <p>Multiply proper fraction</p> $\frac{2}{9} \times 3 = \frac{6}{9}$  <p>Multiply mixed number</p> $2\frac{3}{5} \times 4 =$ $2 \times 4 = 8$ $\frac{3}{5} \times 4 = \frac{12}{5} = 2\frac{2}{5}$ $8 + 2\frac{2}{5} = 10\frac{2}{5}$	<p>Multiply these mixed numbers by 3 and place them in order from the biggest to smallest</p> <p>$2\frac{3}{5}$ $2\frac{6}{8}$ $2\frac{1}{6}$ $2\frac{3}{7}$</p> <p>Did you think they would be in that order? Discuss why.</p>													
solve problems involving numbers up to three decimal places	<p>Solve problems involving numbers up to three decimal places</p> <p><u>Vocabulary</u></p>	<p>Linked to obj -round decimals with two decimal places to the nearest whole number and to one decimal place</p>	<p>Linked to obj -round decimals with two decimal places to the nearest whole number and to one decimal place</p>	<p>Kevin and Peter leave for work from the same house each day. Kevin travels 11.36 miles to get to work and Peter travels 10.29 miles every morning except Monday and Friday when he goes to his mum's house on his way. This adds an extra 3.4 miles to his journey.</p> <p>Who travels the most in a week?</p>												

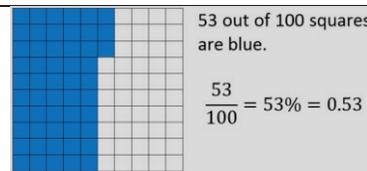
				 <p>Use these digit cards to make the smallest and largest decimal number possible. Find the difference between them. e.g. $3.408 - 1.596 =$</p> <table border="1" data-bbox="1749 662 2152 715"> <tr> <td>1</td> <td>0</td> <td>5</td> <td>3</td> <td>4</td> <td>9</td> <td>6</td> <td>8</td> </tr> </table>	1	0	5	3	4	9	6	8
1	0	5	3	4	9	6	8					
<p>solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those with a denominator of a multiple of 10 or 25.</p>	<p>Solve problems which require knowing percentage and decimal equivalents</p> <p>Vocabulary Percent % Decimal equivalent Multiples Proper fractions Tenth Quarters Three quarters</p>		<p>Introduce pupils to the symbol '%'. Link the word 'cent' to 100 and mention its Roman origins if that helps them to remember.</p> <p>Link percentage with decimal fractions and proper fractions.</p> <p>Use cards with examples of each, ie, 50%; $\frac{1}{2}$; 0.5.</p> <p>Ensure pupils are secure with percentage values related to tenths.</p> <p>Then ensure pupils know that 25% is a quarter and that 75% is three-quarters.</p>	<p>Blake is working out how much money he can spend on his dad's birthday present. He wants to spend 60% on a camera and $\frac{4}{9}$ on a t-shirt. Explain to Blake why this is not possible.</p> <p>Shopping Trip</p> <p>Harry and Gail went shopping. Harry spent 20% of his money and was left with £20. Gail spent 50% of her money and was left with £15. Which of the two had most money in the first place?</p>								

Year 6.

NC Objective	Learning Objectives	Pre-learning	Methods from Calculation Policy	Key Questions for GDS
compare and order fractions, including fractions >1	Compare and order fractions, including fractions >1 <u>Vocabulary</u>		This unit is about moving on pupils' understanding about fractions. Help pupils to recognise that when the denominator is a multiple of a smaller number it often can be simplified. Start by using examples such as $\frac{1}{2}$ and $\frac{2}{4}$ th. Show them on a metre rule and emphasise how they are the same value. After the practical example, move on to show how to simplify fractions by dividing the denominator and the numerator by the same number. In this way it is easier to see their value in relation to each other. Order fractions in ascending and descending order. Simplify fractions	A family were eating tea. The dad ate everything on his plate; the mum ate half of what Dad ate. The sister ate a quarter of what Mum ate and the brother ate a half of what the sister ate. <u>What fraction of their food did each person eat?</u> From 1 pizza, Michael ate $\frac{3}{8}$ and Kelsey ate $\frac{1}{7}$ <u>How much pizza was left over?</u>
identify the value of each digit in numbers given to three decimal places	Identify the value of each digit in numbers given to three decimal places <u>Vocabulary</u> Decimal Decimal places	<u>Recap</u> -Parts of a whole -Identify wholes numbers and decimals up to 2 decimal places	A decimal number is a number that has digits before and after a decimal point . The decimal point is placed after the ones digit. Example: Let us look at the decimal number 3.145 Each digit in a decimal number has a place value depending on its position. The following table shows the number 3.145 in a place value chart. Scroll down the page for more examples and solutions.	Four children are thinking of four different numbers. <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; background-color: #c0392b; color: white; padding: 5px; border-radius: 5px;">3.454</div> <div style="border: 1px solid black; background-color: #3498db; color: white; padding: 5px; border-radius: 5px;">4.445</div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> <div style="border: 1px solid black; background-color: #27ae60; color: white; padding: 5px; border-radius: 5px;">4.345</div> <div style="border: 1px solid black; background-color: #9b59b6; color: white; padding: 5px; border-radius: 5px;">3.54</div> </div> Yvonne: "My number has four hundredths." Alex: "My number has the same amount of ones, tenths and hundredths." Louise: "My number has more tenths and hundredths than ones." Emily: "My number has 2 decimal places." <u>Can you match each number to the correct child?</u>

			<table border="1" style="margin-bottom: 10px;"> <tr> <td>10s Tens</td> <td>1s Ones</td> <td>$\frac{1}{10}$s Tenths</td> <td>$\frac{1}{100}$s Hundredths</td> <td>$\frac{1}{1000}$s Thousandths</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">4</td> <td style="text-align: center;">•</td> <td style="text-align: center;">3</td> <td style="text-align: center;">2</td> </tr> </table> <table border="1"> <thead> <tr> <th colspan="7">Place Value Chart (Decimals)</th> </tr> <tr> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> <th>.</th> <th>Tenths</th> <th>Hundredths</th> <th>Thousandths</th> </tr> </thead> <tbody> <tr> <td>100</td> <td>10</td> <td>1</td> <td>.</td> <td>$\frac{1}{10}$</td> <td>$\frac{1}{100}$</td> <td>$\frac{1}{1000}$</td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;">3</td> <td style="text-align: center;">.</td> <td style="text-align: center;">1</td> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> </tr> </tbody> </table>	10s Tens	1s Ones	$\frac{1}{10}$ s Tenths	$\frac{1}{100}$ s Hundredths	$\frac{1}{1000}$ s Thousandths	1	4	•	3	2	Place Value Chart (Decimals)							Hundreds	Tens	Ones	.	Tenths	Hundredths	Thousandths	100	10	1	.	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$			3	.	1	4	5	
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<p>solve problems which require answers to be rounded to specified degrees of accuracy</p>	<p>Solve problems which require answers to be rounded to specified degrees of accuracy</p> <p style="text-align: center;"><u>Vocabulary</u> Rounding Rounding to the nearest</p>	<p><u>Recap</u></p>	<p>Rounding numbers is about reducing the number of figures in a number. Rounded numbers are easier to work with but they are only approximate so not as accurate.</p> <p>Rounding using a number line</p> <p>You can use a number line to work out whether you need to round up or down. 242 rounded to the nearest hundred is 200 when you put it on the number line.</p>  <p>The same rule applies when rounding decimal places. 3.77 rounded to one decimal place is 3.8. The number line clearly shows 3.77 is closer to 3.8 than 3.6.</p>  <p>When rounding decimal places, only consider the numbers after the decimal point.</p> <p>Rounding without a number line</p> <p>Without a number line you can round up by looking at the first figure to the right of the one you need to round.</p> <p>8.38619 = 8.4 to one decimal place 8.38619 = 8.39 to two decimal places 8.38619 = 8.386 to three decimal places</p>	<p>At the same coffee morning, 56 chocolate cakes are cut into eighths and 37 strawberry cakes are cut into sixths. How many slices does each person eat to the nearest whole slice?</p> 																																						
<p>use common factors to simplify fractions; use common multiples to express fractions in the same denomination</p>	<p>Use common factors to simplify fractions; use common multiples to express fractions in the same denomination</p> <p style="text-align: center;"><u>Vocabulary</u> Common multiples Common factors Simplify fractions denominator</p>	<p><u>Recap</u> Equivalent fractions</p>	<p>This unit is about moving on pupils' understanding about fractions.</p> <p>Help pupils to recognise that when the denominator is a multiple of a smaller number it often can be simplified.</p> <p>Start by using examples such as $\frac{1}{2}$ and $\frac{2}{4}$th. Show them on a metre rule and emphasise how they are the same value.</p> <p>After the practical example, move on to show how to simplify fractions by dividing the denominator and the numerator by the same number.</p>	<p>$\frac{3}{8}$ of your savings is £24, how much savings do you have?</p> <p>$\frac{2}{9}$th of your bank account is £80, how much is there in your bank account?</p> <p>$\frac{5}{6}$th of the distance you ran was 480m. How far did you run?</p> <p>$\frac{3}{4}$ of the strawberries weigh 16Kg, how much does all the strawberries weigh?</p> <p>A charity was asking for people to</p>																																						

			<p>In this way it is easier to see their value in relation to each other.</p> <p>Order fractions in ascending and descending order.</p> <p>Simplify fractions</p> <p>Explain how you would use the common factors of 24 and 30 to express $24/30$ in its simplest form.</p> <p>The common factors of 24 and 30 are 1, 2, 3 and 6. Take the highest factor which is 6.</p> <p>Divide 24 and 30 by 6.</p> $24/30 = 4/5$ <p>$4/5$ is the simplest form.</p>	<p>volunteer to help in their shop each day. Samantha said she would do $3/8$ of Monday. Betty said she would do $6/12$ of Monday.</p> <p>Who did more hours and by how many?</p>
<p>associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$)</p>	<p>Associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$)</p> <p>Vocabulary Decimal Equivalent Fractional value Denominator Numerator Fraction</p>	<p>Recap the division skill</p> <p>Recap times table</p>	<p>This unit has a number of revision issues.</p> <p>Firstly, writing fractions as decimal fractions. Ensure pupils are confident with this and that they can recall familiar fractions, such as, $\frac{1}{4}$; $\frac{3}{4}$; $\frac{1}{8}$ and $1/10$th. Then move on to equivalent fractions and get pupils to write equivalent fractions for familiar fractions such as: $\frac{1}{4}$; $\frac{3}{4}$; $\frac{1}{8}$ and $1/10$th</p> <p>Chn should confidently</p> <p>Know that $1/10$ can be represented as 0.1. Know that $\frac{1}{4}$ can be represented as 0.25 and $\frac{3}{4}$ as 0.75.</p> <p>Helpful to know that: $\frac{1}{100} = 1\%$, $\frac{1}{10} = 10\%$, $\frac{1}{4} = 25\%$, $\frac{1}{2} = 50\%$ and $\frac{3}{4} = 75\%$</p> <p>Know all the fraction/decimal equivalents for fractional values where the denominator is 3, 4, 5, 6, 8 or 10.</p> <p>Know all the fractional equivalents where the denominator is 3, 4, 5, 6, 8 or 10 for decimal fractional values.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  </div> <div style="text-align: center;"> $\frac{7}{10} = \frac{70}{100} = 70\% = 0.7$ </div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> <div style="text-align: center;">  </div> <div style="text-align: center;"> $\frac{3}{4} = \frac{75}{100} = 75\% = 0.75$ </div> </div>	<p>I share equally a length of ribbon between 8 people, and each person gets 0.25m of ribbon.</p> <p>Can you work out how long the original piece of ribbon was?</p>



add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions

Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions

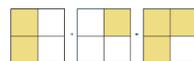
Vocabulary
Mixed number
Proper fraction
Denominators
Numerator
Equivalent fraction

Remind pupils of the terms numerator and denominator.

Express denominator as 'part of' and remind them that one tenth is one part of 10 equal pieces

Add

$$\frac{1}{2} \times \frac{x^2}{x^2} + \frac{1}{4} = \frac{2}{4} + \frac{1}{4} = \frac{3}{4}$$



$$\frac{5}{8} + \frac{1}{4} \times \frac{x^2}{x^2} = \frac{5}{8} + \frac{2}{8} = \frac{7}{8}$$



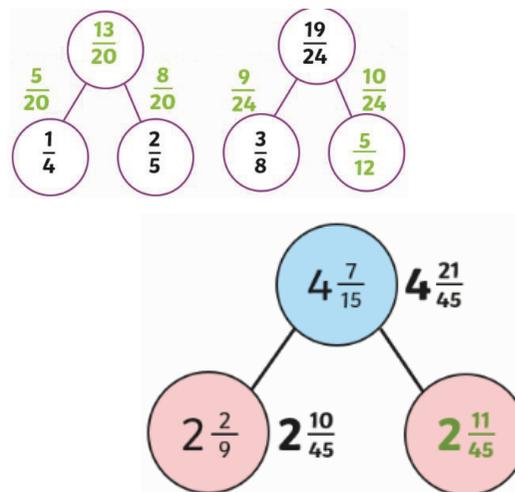
Take away

$$\frac{4}{5} \times \frac{x^2}{x^2} - \frac{3}{10} = \frac{8}{10} - \frac{3}{10} = \frac{5}{10}$$

This unit helps pupils see the relationship between fractions with different denominators by changing the fractions so that they have a common denominator.

The teaching element will mainly concentrate on helping pupils to change fractions so that they have a common denominator.

This needs to be done using simple apparatus with familiar fractions with tenths; eighths, etc. in the first instance.



Sharing Toys

Three children shared 275 toy figures. There were 3 different figures: storm troopers; galaxy raiders; and space pioneers. From the table below work out how many each had.

	Henry	Gill	Jon
Storm Troopers	20	2/5	1/4
Galaxy raiders	1/2	1/5	30
Space Pioneers	1/4	30	1/2

Think of 3 questions for adding fractions with different denominators where the answer is 15/17
Could you do it? Why? Why not?

multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$)

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

Remind pupils about what is meant by the term simplest form.

Move on to multiply whole numbers by a fraction.

If $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$ is Explain your answer
 $2 \times \frac{2}{3} = \frac{4}{3}$

Vocabulary

Simple pairs
Simple form

Then move on to help pupils multiply two fractional values.

$$\frac{2}{4} \times \frac{3}{6}$$

$$\frac{2}{4} \times \frac{3}{6} = \frac{6}{24}$$

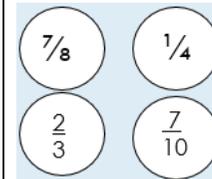
Multiply the numerators. Multiply the denominators.

$$\frac{6}{24} = \frac{1}{4}$$

Simplify the fraction by dividing the numerator and denominator by their largest common factor.

Eventually help pupils to multiply two mixed fraction values.

Remind pupils of the terms: improper fraction; mixed fractions and proper fractions.



Which two fractions multiplied together give you the highest value?
Which gives you the smallest value?

multiply one-digit numbers with up to two decimal places by whole numbers

Multiply one-digit numbers with up to two decimal places by whole numbers

Vocabulary
Decimal places
Multiply

Recap multiplying up to 4 digits by a 1-digit number

Multiplying Decimals by whole numbers

1
$$\begin{array}{r} 3.45 \\ \times 6 \\ \hline \end{array}$$

Write the numbers above each other in the correct columns.

2
$$\begin{array}{r} 3.45 \\ \times 6 \\ \hline 0 \end{array}$$

Multiply the hundredths digit in the decimal number by the one-digit number: 5 hundredths \times 6 ones = 30 hundredths = 3 tenths and 0 hundredths. Write 0 in the answer section and regroup the 3 tenths by writing 3 above the tenths column.

3
$$\begin{array}{r} 23 \\ 3.45 \\ \times 6 \\ \hline 70 \end{array}$$

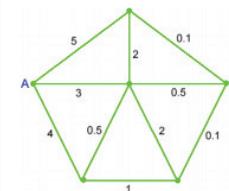
Multiply the tenths digit in the decimal number by the one-digit number and add any regrouped ones: 4 tenths \times 6 ones = 24 tenths = 2 tenths + 2 tenths = 2 tenths + 2 tenths = 4 tenths. Write 4 in the answer section and regroup the 2 ones by writing 2 above the ones column. Write the answer in the provided section.

4
$$\begin{array}{r} 23 \\ 3.45 \\ \times 6 \\ \hline 20.70 \end{array}$$

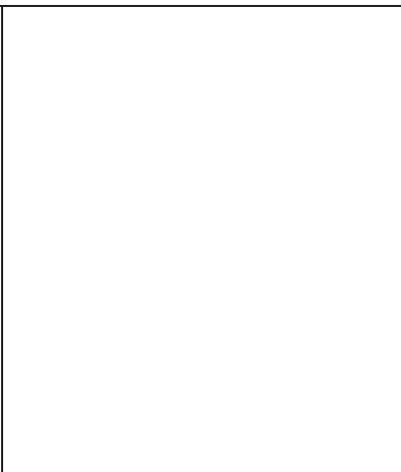
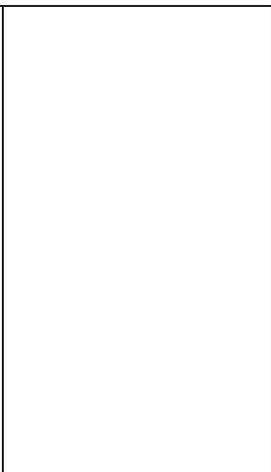
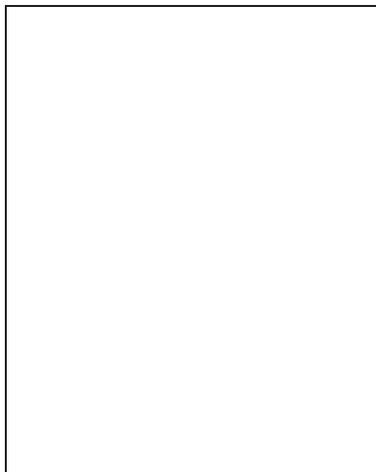
Multiply the ones digit in the decimal number by the one-digit number and add any regrouped ones: 3 ones \times 6 ones = 18 ones = 2 ones + 16 ones = 2 tens and 0 ones. Write the answer in the provided section.

5
$$3.45 \times 6 = 20.70$$

You need to travel from Point A to Point B. You can only travel through each point once.



What is the largest product you can make from A to B?
What is the smallest product you can



Multiplying Decimals by Whole Numbers

1 Write the numbers above each other in the correct columns.

$$\begin{array}{r} 3.45 \\ \times 6 \\ \hline \end{array}$$

2 Multiply the hundredths digit in the decimal number by the one-digit number.

$$\begin{array}{r} 3.45 \\ \times 6 \\ \hline 0 \end{array}$$

5 hundredths \times 6 ones = 30 hundredths = 3 tenths and 0 hundredths.

Write 0 in the answer section and regroup the 3 tenths by writing 3 above the tenths column.

3 Multiply the tenths digit in the decimal number by the one-digit number and add any regrouped tenths.

$$\begin{array}{r} 23 \\ 3.45 \\ \times 6 \\ \hline 70 \end{array}$$

4 tenths \times 6 ones = 24 tenths + 3 tenths = 27 tenths = 2 ones and 7 tenths.

Write 7 in the answer section and regroup the 2 ones by writing 2 above the ones column.

4 Multiply the ones digit in the decimal number by the one-digit number and add any regrouped ones.

$$\begin{array}{r} 23 \\ 3.45 \\ \times 6 \\ \hline 20.70 \end{array}$$

3 ones \times 6 ones = 18 ones + 2 ones = 20 ones = 2 tens and 0 ones.

Write the answer in the provided section.

3.45 \times 6 =

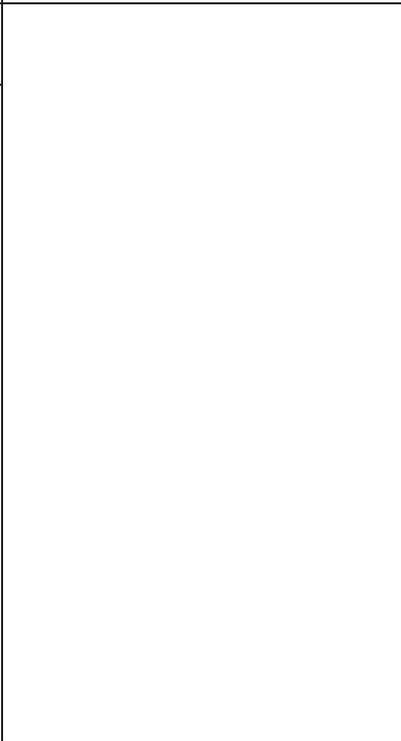
3.45 \times 6 = 20.70

make from A to B?

divide proper fractions by whole numbers (e.g. $\frac{1}{3} \div 2 = \frac{1}{6}$)

Divide proper fractions by whole numbers

Vocabulary
Proper fractions
Whole numbers



This unit has a number of revision issues.

Firstly, writing fractions as decimal fractions. Ensure pupils are confident with this and that they can recall familiar fractions, such as, $\frac{1}{4}$; $\frac{3}{4}$; $\frac{1}{8}$ and 1/10th

Then move on to equivalent fractions and get pupils to write equivalent fractions for familiar fractions such as: $\frac{1}{4}$; $\frac{3}{4}$; $\frac{1}{8}$ and 1/10th

Then move on to dividing fractions by whole numbers.

Division by whole number

The Problem:

$$\frac{2}{3} \div 2$$

Step 1

$$\frac{2}{3 \times 2} = \frac{2}{6}$$

Multiply the denominator by the whole number.

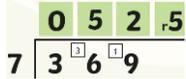
Step 2

$$\frac{2}{6} = \frac{1}{3}$$

Simplify the fraction to its simplest terms.

\div	$\frac{1}{6}$	$\frac{3}{6}$	$\frac{5}{6}$	$\frac{7}{6}$
4				
6				
8				
10				

What do you notice when you complete the table to the left?

multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places	<u>Vocabulary</u>	See maths policy Multiplication and division																																																																										
use written division methods in cases where the answer has up to two decimal places	Use written division methods in cases where the answer has up to two decimal places <u>Vocabulary</u> Decimal point Decimal places Division	Recap dividing up to 4 digits by a one-digit number. $369 \div 7 = 52 \text{ r}5$ 	This unit has a number of revision issues. Firstly, writing fractions as decimal fractions. Ensure pupils are confident with this and that they can recall familiar fractions, such as $\frac{1}{4}$; $\frac{3}{4}$; $\frac{1}{8}$ and 1/10th. Then move on to equivalent fractions and get pupils to write equivalent fractions for familiar fractions such as: $\frac{1}{4}$; $\frac{3}{4}$; $\frac{1}{8}$ and 1/10th. Then move on to dividing fractions by whole numbers. <table border="1" data-bbox="1122 858 1364 1104"> <tr><td colspan="8">Example</td></tr> <tr><td></td><td></td><td></td><td>1</td><td>5</td><td>0</td><td>r2</td><td>1</td></tr> <tr><td>2</td><td>4</td><td>3</td><td>6</td><td>2</td><td>1</td><td></td><td></td></tr> <tr><td></td><td>-</td><td>2</td><td>4</td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td>1</td><td>2</td><td>2</td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td>1</td><td>2</td><td>0</td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td>2</td><td>1</td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>	Example											1	5	0	r2	1	2	4	3	6	2	1				-	2	4								1	2	2						1	2	0							2	1																			Find the smallest number that can be added to 92.7 to make it exactly divisible by 7. <u>How about 8?</u> Each division sentence can be completed using the digits below. If there is more than one digit missing from the division it must be filled with the same digit. e.g. $44 \div 5 = 8.8$   $12 \text{ [blue box]} + \text{[blue box]} = 18.14$ 
Example																																																																												
			1	5	0	r2	1																																																																					
2	4	3	6	2	1																																																																							
	-	2	4																																																																									
			1	2	2																																																																							
			1	2	0																																																																							
				2	1																																																																							
				Divide each of these fractions by 5; then 6; then 8 and finally by 10. Order your 16 answers by value: highest																																																																								

Dividing by a Two-Digit Number Resulting in a Decimal Answer

591 ÷ 12

Work out the answer to two decimal places.

1
$$\begin{array}{r} 4 \\ 12 \overline{) 591} \\ \underline{48} \\ 11 \end{array}$$

First, work out how many 12s there are in 59. The answer to this question is 4, which is written above the 9. We then write the product of 4 and 12 (48) under 59 and subtract, giving 11. The 1 is then brought down and written next to 1 to make 111.

2
$$\begin{array}{r} 49 \\ 12 \overline{) 591} \\ \underline{48} \\ 111 \\ \underline{108} \\ 3 \end{array}$$

Next, work out how many 12s there are in 111. The answer to this question is 9, which is written above the 1. Then, write the product of 9 and 12 (108) under 111 and subtract to give 3.

3
$$\begin{array}{r} 49.0 \\ 12 \overline{) 591.0} \\ \underline{48} \\ 111 \\ \underline{108} \\ 30 \\ \underline{30} \\ 0 \end{array}$$

Extend 591 into decimals to continue the process of long division. The 0 in the tenths place is then brought down and written next to 3 to make 30.

4
$$\begin{array}{r} 49.2 \\ 12 \overline{) 591.0} \\ \underline{48} \\ 111 \\ \underline{108} \\ 30 \\ \underline{24} \\ 60 \\ \underline{60} \\ 0 \end{array}$$

Next, work out how many 12s there are in 30. The answer to this question is 2, which is written above the 0 in the tenths place. Then, write the product of 2 and 12 (24) under 30 and subtract 12, giving 6. The 0 is then brought down and written next to 6 to make 60.

5
$$\begin{array}{r} 49.25 \\ 12 \overline{) 591.00} \\ \underline{48} \\ 111 \\ \underline{108} \\ 30 \\ \underline{24} \\ 60 \\ \underline{60} \\ 0 \end{array}$$

Next, find out how many 12s there are in 60. The answer to this question is 5, which is written above the 0 in the hundredths place. Then, write the product of 5 and 12 (60) under 60 and subtract 60, giving zero.

591 ÷ 12 = 49.25

first.

The image shows four circles arranged in a 2x2 grid. Each circle contains a fraction. The top-left circle contains $\frac{2}{3}$, the top-right circle contains $\frac{5}{6}$, the bottom-left circle contains $\frac{3}{10}$, and the bottom-right circle contains $\frac{7}{8}$.