

Number: Fractions Progression (including Decimals and Percentages)

Counting in fractional steps

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	<p>Count in fractions up to a whole (halves, quarters and thirds)</p> <p>spotting patterns when counting (PS and reasoning)</p>	<p>Count up and down in tenths.</p> <p>To count forwards and backwards in fractions within 1 using a number line to support.</p>	<p>Count up and down in tenths and hundredths.</p> <p>To count fractions greater than 1. To count in mixed numbers.</p>	<p>Counting in 0.1s and crossing the whole</p>	<p>To count forwards and backwards in fractions and to find equivalent fractions.</p>

Recognising fractions

<p>To recognise, find and name a half as one of two equal parts of an object, shape or quantity.</p> <p>To recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.</p> <p>To know that a half means "one of two equal parts"</p> <p>To know and show how the total can be shared</p>	<p>To 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>To know what a part is</p> <p>To know what a whole is</p> <p>To know if a shape has been split into equal or unequal parts.</p> <p>To know that the numerator is the top number</p>	<p>To recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.</p> <p>To find a unit fraction, they divide the whole into equal parts.</p> <p>To find unit fractions of a set of objects, and connect this to what they already know about dividing quantities into equal parts using known division facts.</p>	<p>To recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.</p> <p>To partition a mixed number in different ways.</p> <p>To recognize and represent mixed numbers on a number line.</p> <p>To know that an improper fraction is a fraction where the numerator is greater</p>	<p>To recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (appears also in Equivalence)</p> <p>To find a fraction of a quantity and amount using bar models.</p> <p>To find the whole using bar models.</p>	<p>To find a fraction of an amount.</p> <p>To find the whole.</p> <p>To know that $\frac{3}{4}$ is the same as $3 \div 4$ for example to use this knowledge to convert between fractions and decimals.</p>
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Number: Fractions Progression (including Decimals and Percentages)

<p>equally into two groups.</p> <p>To know that to find a half, they need two equal groups.</p> <p>To know that half can mean "one out of every two objects"</p> <p>To know if a part is equal or not equal.</p> <p>To use their knowledge of how a number can be shared equally into four groups.</p> <p>To see the link between finding half of an amount and half again to find a quarter (reasoning)</p>	<p>To know that the denominator is the bottom number</p> <p>To recognize that a unit fraction is one in which the whole has been split into equal parts and one of those parts is shaded.</p> <p>To know that a non-unit fraction is a fraction where the numerator is greater than 1.</p> <p>To begin to understand that when the numerator of a fraction is equal to its denominator, then the fraction is equivalent to 1 whole.</p> <p>To know that $\frac{3}{4}$ is made up of 3 lots of $\frac{1}{4}$.</p> <p>To recognize and use fractions in the context of length.</p> <p>To find a quarter by recognising that it is half of a half or divide by 2 twice. Decide</p>	<p>To know that the role of the denominator shows how many equal parts the whole has been divided into.</p> <p>To know that a non-unit fraction is made up of a quantity of unit fractions.</p> <p>To know that when the numerator of a fraction is equal to its denominator, then the fraction is equivalent to 1 whole.</p> <p>To recognize and use fractions in a range of contexts such as mass, volume and length</p> <p>To recongise and compare fractions and find equivalent fractions within 1 on a numberline</p> <p>To find a fraction of an amount and apply this in a range of contexts.</p>	<p>than or equal to the denominator.</p>		
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Number: Fractions Progression (including Decimals and Percentages)

	which method they find more efficient. (reasoning)				
		To recognize that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10.			
		To recognize and use fractions as numbers: unit fractions and non-unit fractions with small denominators			

Core Representations for Fractions

Shapes, cubes, counters, folding paper, beads, small world objects.	Part whole model, bar model. Shapes, cubes, diagrams, counters, beads, folding paper, small world objects.	Non-standard and standard representations. Bar models. Shaded shapes Number lines. Scales. Part whole model. Diagrams	Diagrams Bar models Number line Part whole Fraction walls.	Fractions of shape Number lines Bar models Fraction walls.	Bar model Number line Area model for multiplying fractions
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Comparing Fractions

	To compare $\frac{1}{2}$ and $\frac{3}{4}$ of a number and decide which is greater.	compare and order unit fractions and non-unit fractions.	To compare and order mixed numbers. To find and compare	To compare and order fractions less than one whose denominators are all multiples of the	To compare and order fractions, including fractions >1
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Number: Fractions Progression (including Decimals and Percentages)

	<p>To compare the written notation for $\frac{1}{2}$ and $\frac{1}{4}$ and identify what the digits represent. (reasoning)</p> <p>To consider what is the same and what is different about $\frac{1}{3}$ compared to $\frac{1}{4}$ and $\frac{1}{2}$.</p> <p>To identify patterns when finding $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$ and $\frac{4}{4}$ of a number. (PS and reasoning)</p>	<p>To recognize and compare fractions on a numberline and using a bar model.</p>	<p>equivalent fractions beyond 1 using a number line and bar models.</p>	<p>same number To compare and order fractions greater than one.</p>	
Recognising Decimals					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			<p>To read and write decimals up to 2 decimal places.</p>	<p>To read and write decimals up to three decimal places.</p>	<p>To represent numbers, read and write decimals with up to 3 decimal places</p>

Number: Fractions Progression (including Decimals and Percentages)

Comparing decimals

			Compare and order decimals. With the same number of decimal places up to two decimal places.	To order and compare numbers with up to three decimal places	To identify the value of each digit in numbers given to three decimal places and compare and order.
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Rounding including decimals.

			To round decimals with one decimal place to the nearest whole number.	To round decimals with two decimal places to the nearest whole number and to one decimal place	To round numbers with up to 3 decimal places to the nearest integer and tenth (1 decimal place), as well as rounding to the nearest hundredth (2 decimal places)
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Equivalence (fractions, decimals and percentages)

	<p>To write simple fractions e.g. $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$.</p> <p>To know that $\frac{1}{2}$ and $\frac{2}{4}$ are equivalent.</p>	<p>To recognize and show, using diagrams, equivalent fractions with small denominators.</p> <p>To recognise and compare fractions and find equivalent fractions within 1 on a numberline.</p> <p>To know that when the numerator of a</p>	<p>To recognize and show, using diagrams, families of common equivalent fractions.</p> <p>To find equivalent fractions beyond 1 using a number line and bar models.</p> <p>To convert a mixed number into an improper fraction.</p>	<p>Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.</p> <p>Find fractions that are equivalent to a unit and non unit fraction.</p> <p>Use knowledge of multiples and factors to find equivalent</p>	<p>Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.</p> <p>To recognize when fractions are, and are not, in their simplest form.</p> <p>To find fraction and decimal equivalences including examples</p>
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Number: Fractions Progression (including Decimals and Percentages)

		fraction is equal to its denominator, then the fraction is equivalent to 1 whole.		fractions. Convert between improper and mixed numbers.	involving larger denominators to simplify.
			Recognise and write decimal equivalents of any number of tenths or hundredths.	<p>Read and write decimal numbers as fractions (e.g. $0.71 = \frac{71}{100}$)</p> <p>To recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.</p> <p>To know the equivalent decimals for halves, quarters and fifths.</p> <p>To know the equivalent decimals for $\frac{3}{4}$, $\frac{2}{5}$, $\frac{3}{5}$, $\frac{4}{5}$</p> <p>To know a thousandth as a decimal.</p>	To associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$)

Number: Fractions Progression (including Decimals and Percentages)

			<p>To recognise and write decimal equivalents to $\frac{1}{4}$; $\frac{1}{2}$; $\frac{3}{4}$;</p>	<p>To write percentages as a fraction with denominator 100 as a decimal fraction.</p> <p>To know the equivalent percentages for halves, quarters, fifths and tenths.</p>	<p>Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.</p> <p>To know equivalent percentages and fractions for more complex examples such as $11/25$ by knowing to get the denominator to 100.</p>
Core Representations for Decimals					
			<p>Counters, place value counters. Number lines. Place value chart Gattegno chart for multiplying and dividing decimals. Hundred square. Part whole model Bar model.</p>	<p>Base ten to exchange 10 tenths for 1 whole.</p> <p>Hundred square Place value counters Place value chart Part whole models</p> <p>Numberlines Tens frame</p> <p>Gattegno charts for multiplying and dividing decimals.</p>	<p>Hundred square Gattegno charts Place value charts and counters.</p>
Addition and Subtraction of decimals.					
			<p>To make a whole with tenths using knowledge of number bonds to do this</p>	<p>To partition decimals in different ways.</p>	<p>To partition decimals including integers in different ways.</p>

Number: Fractions Progression (including Decimals and Percentages)

			<p>e.g: $6+4 = 10$ so $0.6 + \underline{\quad} = 1$.</p> <p>To make 1 whole from hundredths using knowledge of number bonds to 100.</p> <p>To partition decimals using standard partitioning and flexible partitioning.</p>	<p>To partition thousandths into tenths.</p> <p>To flexibly partition decimal numbers with 3 decimal places.</p> <p>To add and subtract decimals within 1 whole using known facts.</p> <p>To find complements to 1 for numbers with up to 3 decimal places.</p> <p>To add and subtract decimals including in the context of money and measure.</p>	<p>To add and subtract decimals in a range of contexts.</p>
Addition and subtraction of decimals					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		<p>To add and subtract fractions with the same denominator within one whole (e.g. $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$)</p> <p>To know that adding</p>	<p>To add and subtract fractions with the same denominator.</p> <p>To add and subtract mixed numbers with the same denominator.</p> <p>To add and subtract</p>	<p>To add and subtract fractions with the same denominator and multiples of the same number.</p> <p>To add and subtract three fractions.</p>	<p>To add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions</p>

Number: Fractions Progression (including Decimals and Percentages)

		<p>unit fractions with the same denominator creates a non-unit fraction.</p> <p>To know that when adding and subtracting fractions the denominator stays the same.</p>	<p>improper fractions with the same denominator.</p> <p>To subtract fractions from the whole.</p>	<p>To add and subtract a mixed number to/from a whole number mentally.</p> <p>To add and subtract mixed numbers.</p> <p>To recognize mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (e.g. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$)</p>	
Multiplication and Division of fractions.					
				<p>To multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.</p> <p>To multiply unit, non unit fractions and mixed numbers by an integer.</p>	<p>To multiply together simple pairs of proper fractions, writing the answer in its simplest form (e.g. $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$)</p> <p>To multiply mixed numbers by whole numbers.</p> <p>To multiply one-digit numbers with up to two decimal places by whole numbers</p>
					<p>To divide proper fractions by whole numbers (e.g. $\frac{1}{3} \div 2 =$</p>

Number: Fractions Progression (including Decimals and Percentages)

					$\frac{1}{6}$)
Multiplication and division of decimals					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			To 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.	To Multiply by 10, 100 and 1000 To Divide by 10, 100 and 1000.	To Multiply one-digit numbers with up to two decimal places by whole numbers To divide decimals by integers. To Multiply and divide decimals in context.
					To multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places
					To 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.
					To associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$)
					To use written division

Number: Fractions Progression (including Decimals and Percentages)

					methods in cases where the answer has up to two decimal places
Recognising and calculating with Percentages					
				To know that "per cent" relates to "number of parts per 100"	To understand percentages by using bar models and hundred squares to represent them. To find percentage of amounts.
Core representations for percentages.					
				Hundred square Bar models Numberline	Bar models
Problem solving					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	To identify the part and to use the fact that all the parts must be equal to find the whole. PS strands to be covered: Logic (missing values) Visual Word problems	To explore different ways the whole can be partitioned. To solve g problems in the form of $3/7 + _ / 7 = 1$ (missing values) To find a fraction of an amount and apply this into a range of problems including	To 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. To explore different ways to make a whole.	To solve addition and subtraction decimal word problems in the context of money and measure. To find efficient strategies when adding decimals. To find missing values when multiplying and dividing by 10, 100 and	To spot patterns on number lines when simplifying. To apply all the fraction skills into multi step problems. To solve problems which require answers to be rounded to specified degrees of accuracy

Number: Fractions Progression (including Decimals and Percentages)

		<p>multi- step word problems.</p> <p>Spotting patterns when ordering fractions</p> <p>PS strands to be covered: Finding possibilities. Logic (missing values) Visual Word problems Rules and patterns</p>		<p>1000.</p>	<p>To apply addition and subtraction of decimals to word problems including that of money and measure</p> <p>To apply multiplication and division of decimals to word problems including money and measure</p> <p>To compare and order fractions, decimals and percentages and apply to word problems.</p> <p>To find percentage of amounts and apply to word problems (money)</p> <p>To use their understanding of percentages to find the whole number from a given percentage.</p>
			<p>To solve simple measure and money problems involving fractions and decimals to two decimal places.</p>	<p>To 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>	

Number: Fractions Progression (including Decimals and Percentages)

			<p>PS strand to be covered: Finding possibilities Logic (missing values) Visual Word problems</p>	<p>To identify patterns between fractions of amounts and multiplying fractions.</p> <p>PS strand to be covered: Logic (missing values) Find possibilities – most efficient method Word problems Visual Rules and patterns</p>	<p>PS strand to be covered: Logic (missing values) Find possibilities – most efficient method Word problems Visual Rules and patterns</p>
Key Vocabulary					
Whole, parts, halves, equal, quarter, equal parts, share, altogether	Parts, wholes, equal, unequal, $\frac{1}{2}$ numerator, denominator, shared equally, quarter, third, unit fractions, non-unit fractions, equivalence, three-quarters,	Divided equally, unit fractions, denominator, numerator, greater, smaller, equal parts, non-unit, measure, scale, intervals, estimate, equivalent. Add, altogether, difference, partitioning,	Mixed number, integer, proper fractions, improper fractions, convert, equivalent, unit fraction, non-unit fraction. Tenth, decimal, convert, value, digit, wholes, hundredths, partition, flexibly partition, column, round, integer	Mixed number, integer, proper fractions, improper fractions, convert, equivalent, unit fraction, non-unit fraction. Two decimal places, tenths, hundredths, value, digit, thousandths, three decimal places, round to one decimal place, percentage,	Simplify, common factors, multiple, mixed number, proper fractions, improper fraction, common denominator, integer, product, convert, recurring, equivalent,
Ready to Progress					
		<p>3F-4 Add and subtract fractions with the same denominator, within 1.</p> <p>3F-3 Reason about the location of any fraction</p>	<p>4F-2 Add and subtract improper and mixed fractions with the same denominator, including bridging whole numbers, for example: $\frac{7}{5} + \frac{4}{5} =$</p>	<p>5F-2 Find equivalent fractions and understand that they have the same value and the same position in the</p>	<p>6F-2 Express fractions in a common denomination and use this to compare fractions that are similar</p>

Number: Fractions Progression (including Decimals and Percentages)

		<p>within 1 in the linear number system</p> <p>3F-2 Find unit fractions of quantities using known division facts (multiplication tables fluency).</p> <p>3F-1 Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts.</p>	<p>$1\frac{1}{5}$ 3 and $7\frac{7}{8} - 2\frac{2}{8} = 3$ and $\frac{5}{8}$ 7 and $2\frac{2}{5} + 4\frac{4}{5} = 8$ and $\frac{1}{5}$ 8 and $1\frac{1}{5} - 4\frac{4}{5} = 7$ and $2\frac{2}{5}$</p> <p>4F-2 Convert mixed numbers to improper fractions and vice versa.</p> <p>4F-1 Reason about the location of mixed numbers in the linear number system.</p>	<p>linear number system.</p> <p>5F-3 Recall decimal fraction equivalents for a half, quarter, fifth, and a tenth, and for multiples of these proper fractions.</p> <p>5F-1 Find non-unit fractions of quantities.</p> <p>5MD-1 Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size.</p> <p>5NF-1 Secure fluency in multiplication table facts, and corresponding division facts, through continued practice.</p>	<p>in value.</p> <p>6F-3 Compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denomination as a comparison strategy.</p> <p>6F-1 Recognise when fractions can be simplified, and use common factors to simplify fractions.</p> <p>6NPV-4 Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.</p> <p>6NPV-1 Understand the relationship between powers of 10 from 1 hundredth to 10</p>
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Number: Fractions Progression (including Decimals and Percentages)

					million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000).□
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