Ashbury Meadow Primary School Mathematics Curriculum

Progression in Fractions, Decimals, Percentages, Ratio & Proportion

Year Group	Knowledge and Skills Supporting Resource: Maths No Problem Essential & most valuable knowledge for the next key stage is highlighted in yellow	Vocabulary
Nursery	N/A	
Reception	N/A	
Year 1	**Fractions** ● To split an object (shape) into two equal parts; to identify shapes that have been split into two equal parts. ● To split an object (shape) into four equal parts; to identify shapes that have been split into four equal parts. ● To share and group objects into halves and quarters; to determine half of a number and a quarter of a number. Y1 National Curriculum – End Point: Pupils will be taught to: - recognise, find and name a half as one of two equal parts of an object, shape or quantity - recognise, find and name a quarter as one of four equal parts of an object, shape or quantity	half halve quarter same parts group
Year 2	**Fractions** ● To make equal parts from a whole using simple and complex methods. ● To show and recognise halves and quarters. ● To show and identify more than one quarter using materials and pictures. ● To show and identify thirds in shapes; to use the vocabulary 'numerator' and 'denominator' when referring to fractions. ● To identify and name fractions by looking at the number of pieces and how many are shaded in. ● To recognise equivalent fractions in quarters, thirds and halves. ● To compare and order similar fractions by looking at the size of the pieces shaded. ● To compare and order fractions with different denominators. ● To count the number of wholes and parts to form mixed numbers. ● To count in halves and place halves onto a number line using pictures. ● To count in quarters and place quarters onto a number line using pictures. ● To count in thirds and place thirds onto a number line using pictures. ● To find fractions (half) of whole numbers. ● To find a fraction (third) of a whole number. ● To find a fraction (quarter) of a number.	*All of the above, plus:* part equal parts fraction one whole one half two halves one quarter two… three… four quarters

	● To find a fraction (half, third, quarter) of a quantity (length) <u>Y2 National Curriculum – End Point:</u> Pupils will be taught 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 ▪ write simple fractions for example, $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$.		
Year 3	**Fractions** ● To count in tenths; to recognise tenths and be able to determine how many tenths are shaded. ● To make number pairs to create 1; to combine fractions to make 1. ● To add fractions with the same denominator. ● To consolidate adding fractions with the same name; to learn how fractions can add to 1. ● To subtract fractions with the same name. ● To find equivalent fractions through paper folding and shading. ● To find equivalent fractions using paper folding and shading. ● To find equivalent fractions; to place fractions on a number line. ● To find fractions equivalent to 1/ 2; to use pictorial representations and multiplication to show equivalence. ● To find equivalent fractions using concrete objects and pictorial representations. ● To find equivalent fractions using pictorial representations and multiplication. ● To find the simplest fraction using visualisation and concrete materials. ● To find the simplest fraction using pictorial representations and division. ● To find equivalent fractions using multiplication and division; to determine whether or not a fraction is equivalent. ● To compare the fractions 1/ 2 and 1/ 4 using pictorial representations and concrete materials ● To compare fractions using pictorial representations; to understand the numerical nature of the numerator. ● To compare fractions with different names (denominators) using pictorial representations and number lines. ● To add fractions using pictorial representations; to simplify fractions after adding them. ● To subtract fractions using pictorial representations; to simplify fractions after they have been subtracted. ● To subtract fractions from a whole amount; to use pictorial representations of whole numbers to help subtract fractions. ● To determine a fraction of a whole number using pictorial representations. ● To find a fraction of a whole number using pictorial representations, multiplication and concrete objects. ● To consolidate finding the fraction of a whole number.	*All of the above, plus:* one third two thirds three thirds one tenth equivalent number line numerator denominator	

	- To divide 1 between more than 1; to share 1 whole equally between more than 1. - To share more than 1 using pictorial representations and division. - To share more than 1; to recognise a whole and its parts using pictures and number lines. - To show more than 1 whole after sharing a number of items equally; to use pictorial representations to share whole items equally. - To apply bar modelling to represent fractions in word problems; to solve word problems using pictorial representations and abstract methods. - To use bar models to solve word problems involving the fraction 1/ 2. - To use bar models to solve word problems involving the fractions 1/ 3 and 1/ Y3 National Curriculum – End Point: Pupils will be taught to: - count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 - recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators - recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators - recognise and show, using diagrams, equivalent fractions with small denominators - add and subtract fractions with the same denominator within one whole [for example, 5/7 + 1/7 = 6/7] - compare and order unit fractions, and fractions with the same denominators - solve problems that involve all of the above.		
Year 4	**Fractions** - To count in hundredths. - To write mixed number fractions. - To show mixed number fractions on a number line. - To find equivalent fractions. - To find equivalent fractions (further practise). - To simplify mixed number fractions. - To simplify improper fractions. - To add fractions. - To add fractions (recording answers as a mixed number). - To add fractions (simplest form). - To subtract fractions. - To subtract fractions (equivalence).	*All of the above, plus:* eighth sixth fifth twentieth proportion in every for every decimal decimal fraction decimal point decimal place simplify mixed number fraction improper fraction	

	● To solve word problems.
	
	Decimals
	   ● <mark>To record tenths.</mark>
	   ● <mark>To record in tenths.</mark>
	   ● <mark>To record in tenths (in different ways).</mark>
	   ● <mark>To write hundredths.</mark>
	   ● <mark>To write hundredths.</mark>
	   ● To write hundredths (in different ways).
	   ● <mark>To record hundredths.</mark>
	   ● <mark>To write decimal numbers.</mark>
	   ● <mark>To compare and order decimal numbers.</mark>
	   ● To create number sequences.
	   ● <mark>To round decimal numbers.</mark>
	   ● <mark>To write fractions as decimal numbers.</mark>
	   ● To divide whole numbers by 10.
	   ● To divide whole numbers by 100.
	
	Y4 National Curriculum – End Point:
	Pupils will be taught to:
	   - recognise and show, using diagrams, families of common equivalent fractions
	   - count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.
	   - 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
	   - add and subtract fractions with the same denominator
	   - recognise and write decimal equivalents of any number of tenths or hundredths
	   - recognise and write decimal equivalents to ¼ , ½ , ¾
	   - 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
	   - round decimals with one decimal place to the nearest whole number
	   - compare numbers with the same number of decimal places up to two decimal places
	   - solve simple measure and money problems involving fractions and decimals to two decimal places
		decimal
		hundredths

Year 5	**Fractions**	*All of the above, plus* reduced to

	- To divide whole numbers to create fractions; to create mixed numbers and improper fractions when dividing whole numbers. - To write improper fractions and mixed numbers using a number line and pictorial methods. - To find equivalent fractions using pictorial methods. - To compare and order fractions using the pictorial method. - To compare and order improper fractions using the pictorial method. - To compare mixed numbers using pictorial representations; to find common denominators where one fraction is already the common denominator for all fractions in the question. - To make number pairs (number bonds) with fractions with different denominators. - To add unlike fractions by finding a common denominator using pictorial methods. - To add together unlike fractions where the sum is greater than 1, creating mixed numbers or improper fractions. - To add unlike fractions which create improper fractions and mixed numbers that give rise to simplification. - To subtract fractions with different denominators; to subtract fractions from whole numbers. - To subtract fractions where the denominators are not the same; to use bar models as a key strategy for subtracting fractions. - To subtract fractions and mixed numbers from mixed numbers with different denominators. - To multiply fractions by whole numbers creating other fractions, mixed numbers or improper fractions - To multiply fractions by whole numbers where the product is an improper fraction or mixed number. - To multiply mixed numbers by whole numbers, creating larger mixed numbers. - To multiply mixed numbers by whole numbers in multi-step word problems. **Decimals** - To write decimal numbers. - To read and write decimals. - To compare tenths and hundredths written as decimals. - To order and compare decimals. - To compare and order decimals of amounts. - To write fractions as decimals. - To add and subtract amounts in decimals. - To add and subtract decimals; to add and subtract amounts in pounds and pence. - To add and subtract amounts in pounds and pence. - To add and subtract decimals; to add and subtract amounts in pounds and pence. - To add and subtract decimals to find the smallest possible sum and difference. - To add and subtract decimals; to find number pairs that add up to 1. - To add and subtract the perimeter of an object using decimals. - To round decimals to the nearest whole number; to round numbers to nearest tenth	cancel ninth twelfth ratio to every as many as percentage % per cent convert

	Percentages
	    ● To compare quantities; to compare fractions, decimals and percentages; to convert fractions to decimals and percentages.
	    ● To convert values of an amount into percentages; to convert fractions into percentages.
	    ● To convert values of an amount into percentages; to convert fractions into percentages.
	
	Y5 National Curriculum – End Point:
	Pupils will be taught to:
	    - compare and order fractions whose denominators are all multiples of the same number
	    - identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths
	    - recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, 2/5 + 4/5 = 6/5 = 1 1/5]
	    - add and subtract fractions with the same denominator and denominators that are multiples of the same number
	    - multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams
	    - read and write decimal numbers as fractions [for example, 0.71 = 71/100]
	    - recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
	    - round decimals with two decimal places to the nearest whole number and to one decimal place
	    - read, write, order and compare numbers with up to three decimal places
	    - solve problems involving number up to three decimal places
	    - recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal
	    - solve problems which require knowing percentage and decimal equivalents of ½, ¼ , 1/5 , 2/5 , 4/5 and those fractions with a denominator of a multiple of 10 or 25.		

Year 6	**Fractions**
	    ● To use concrete materials to simplify fractions; to recognise equivalence in fractions to 1/ 4.
	    ● To simplify fractions using division and common factors; to represent fractions using concrete materials and pictorial representations.
	    ● To compare fractions and place them in order from smallest to largest.
	    ● To compare and order fractions by finding common denominators.
	    ● To compare and order fractions using common factors.
	    ● To add and subtract unlike fractions; using pictorial representations to compare fractions and add/subtract.
	    ● To add and subtract fractions with different denominators.
		All of the above, plus
		
		thousandth	

- To add and subtract mixed numbers, including fractions with different denominators; to subtract from the whole and add the remainder back on.
- To add and subtract fractions with different denominators; to add and subtract mixed numbers.
- To multiply fractions using pictorial representations and abstract methods.
- To determine if the commutative law applies to fractions; to multiply fractions using concrete materials and pictorial representations.
- To use concrete materials to understand and solve the multiplication of fractions; to simplify equations using pattern blocks.
- To divide a fraction by a whole number; to use pictorial representation to divide whole numbers into fractions.
- To divide fractions by whole numbers using concrete materials and pictorial representations; to divide fractions when the numerator and divisor are not easily divisible.
- To divide fractions by a whole number; to use pictorial representations to support division.

Decimals
- To read and write decimals to thousandths; to use concrete materials to represent decimals.
- To divide whole numbers by larger whole numbers; to use Base 10 materials to represent tenths, hundredths and thousandths.
- To divide whole numbers that give rise to decimals; to calculate decimal fraction equivalents using long division.
- To convert fractions into decimals using bar models and long division.
- To write fractions as decimals; to use long division as the key strategy for turning fractions into decimals.
- To multiply decimals by whole numbers using partitioning or the worded method to help find the solution.
- To multiply whole numbers that include a decimal by other whole numbers; to use partitioning and the worded method as key strategies.
- To multiply decimals by whole numbers, including regrouping and renaming.
- To multiply decimals by whole numbers using a variety of methods; to use the heuristic 'making a list' to help solve a problem.
- To divide decimals using number bonds and number discs as the key strategies.
- To divide decimals using bar models, number bonds and long division as key strategies, including regrouping and renaming.
- To multiply decimals by a 2-digit whole number using number discs and the column method.
- To divide decimals by 2-digit numbers using number bonds and the worded method.
- To divide decimals by 2-digit whole numbers using number bonds and the worded method.

Percentages
- To find the percentage of a whole number using division and multiplication; to use bar modelling as a pictorial approach to calculating percentage.

- To find the percentage of a quantity; to use bar model diagrams to support the division and multiplication of numbers towards the percentage.
- To find the percentage change in an amount over time; to calculate the percentage change where the number gives rise to a decimal.
- To use percentage, bar models and fractions to compare amounts.

Ratio
- To use ratios and fractions to compare objects; to find the relationship between ratios, percentages and fractions.
- To determine the ratio of a quantity using concrete materials; to simplify ratios using concrete materials in addition to division.
- To compare more than two quantities using the term 'ratio'; to use bar models to express ratios where there is more than one quantity.
- To compare quantity using both fractions and ratios; to use bar model diagrams to represent ratios.
- To compare quantities using bar models and common factors; to use multiplication and division to simplify ratios.
- To compare numbers using ratios; to make decisions about simplifying ratios using division.
- To solve word problems using a variety of heuristics including guess-and-check and bar models; to apply knowledge of ratios to word problems.
- To solve word problems using the bar model heuristic; to employ division and multiplication as primary strategies when solving word problems visually.
- To apply the guess-and-check and advanced bar model heuristic to ratio word problems.

Y6 National Curriculum – End Point:
Pupils will be taught to:
- use common factors to simplify fractions; use common multiples to express fractions in the same denomination
- compare and order fractions, including fractions > 1
- add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
- multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, ¼ × ½ = 1/8]
- divide proper fractions by whole numbers [for example, 1/3 ÷ 2 = 1/6]
- associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 3/8]
- identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places
- multiply one-digit numbers with up to two decimal places by whole numbers
- use written division methods in cases where the answer has up to two decimal places
- solve problems which require answers to be rounded to specified degrees of accuracy

		- recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.	