

**Ashwell Primary School**  
**Maths Curriculum**  
***Fractions, Decimals, Percentages, Ratio and Proportion***  
***Skills & Knowledge Progression***



**RECEPTION – relevant skills from the Number strand (doubles/halves)**

<p><b>Core knowledge to be acquired (number strand):</b></p> <ul style="list-style-type: none"> <li>▪ Compare numbers</li> <li>▪ Explore the composition of numbers to 10.</li> </ul>	<p><b>Key Vocabulary:</b></p> <p>Double, doubling, halving, parts, whole.</p>
<p><b>EARLY LEARNING GOALS – NUMBER:</b></p> <ul style="list-style-type: none"> <li>▪ Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, <b>including double facts.</b></li> </ul>	<p><b>EARLY LEARNING GOALS – NUMERICAL PATTERNS:</b></p> <ul style="list-style-type: none"> <li>▪ Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.</li> <li>▪ Explore and represent patterns within numbers up to 10, including evens and odds, <b>double facts and how quantities can be distributed equally</b></li> </ul>
<p><b>Prior knowledge / skills this builds on:</b></p> <ul style="list-style-type: none"> <li>▪ Link numerals and amounts.</li> <li>▪ Compare quantities using language: 'more than', 'fewer than'.</li> </ul>	<p><b>What comes next:</b></p> <ul style="list-style-type: none"> <li>▪ Count in multiples of twos (number strand)</li> <li>▪ Recognise, find and name a half as one of two equal parts of an object, shape or quantity.</li> <li>▪ Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.</li> </ul>

**YEAR 1 – Fractions**

<p><b>Core knowledge to be acquired:</b></p> <ul style="list-style-type: none"> <li>▪ Recognise, find and name a half as one of two equal parts of an object, shape or quantity.</li> <li>▪ Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.</li> </ul>	<p><b>Key Vocabulary (in addition to previous year group):</b></p> <p>fraction, half, one of two equal parts, quarter, one of four equal parts equal grouping, equal sharing, parts of a whole.</p>
<p><b>Prior knowledge / skills this builds on:</b></p> <ul style="list-style-type: none"> <li>▪ Compare numbers</li> <li>▪ Explore the composition of numbers to 10.</li> <li>▪ Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, <b>including double facts.</b></li> </ul>	<p><b>What comes next:</b></p> <ul style="list-style-type: none"> <li>▪ Recognise, find, name and write fractions <math>\frac{1}{3}</math>, <math>\frac{1}{4}</math>, <math>\frac{2}{4}</math> and <math>\frac{3}{4}</math> of a length, shape, set of objects or quantity.</li> <li>▪ Write simple fractions [e.g.: <math>\frac{1}{2}</math> of 6 = 3].</li> <li>▪ Recognise the equivalence of <math>\frac{2}{4}</math> and <math>\frac{1}{2}</math>.</li> </ul>

## YEAR 2 – Fractions

### Core knowledge to be acquired:

- 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 [e.g.:  $\frac{1}{2}$  of 6 = 3].
- Recognise the equivalence of  $\frac{2}{4}$  and  $\frac{1}{2}$ .

### Key Vocabulary (in addition to previous year group):

equivalent fraction, mixed number, numerator, denominator, two halves, two quarters, three quarters, third(s), one of three equal parts.

### Prior knowledge / skills this builds on:

- 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.

### What comes next:

- 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.
- Compare and order unit fractions and fractions with the same denominators.
- Add and subtract fractions with the same denominator within one whole [e.g.:  $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$ ].
- Solve problems that involve Y3 fraction skills learned.

## YEAR 3 – Fractions

### Core knowledge to be acquired:

- 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.
- Compare and order unit fractions and fractions with the same denominators.
- Add and subtract fractions with the same denominator within one whole [e.g.:  $5/7 + 1/7 = 6/7$ ].
- Solve problems that involve Y3 fraction skills learned.

### Key Vocabulary (in addition to previous year group):

fourths, fifths, etc to tenths.

### Prior knowledge / skills this builds on:

- Recognise, find, name and write fractions  $1/3$ ,  $1/4$ ,  $2/4$  and  $3/4$  of a length, shape, set of objects or quantity.
- Write simple fractions [e.g.:  $1/2$  of 6 = 3].
- Recognise the equivalence of  $2/4$  and  $1/2$ .

### What comes next:

- Count up and down in hundredths; recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten.
- Recognise and show, using diagrams, families of common equivalent fractions.
- Add and subtract fractions with the same denominator.
- Recognise and write decimal equivalents to  $1/4$ ,  $1/2$ ,  $3/4$ .
- Recognise and write decimal equivalents of any number of tenths or 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.
- 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.
- 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 simple measure and money problems involving fractions and decimals to two decimal places.

## YEAR 4 – Fractions and Decimals

### Core knowledge to be acquired:

- Count up and down in hundredths; recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten.
- Recognise and show, using diagrams, families of common equivalent fractions.
- Add and subtract fractions with the same denominator.
- Recognise and write decimal equivalents to  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$ .
- Recognise and write decimal equivalents of any number of tenths or 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.
- 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.
- 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 simple measure and money problems involving fractions and decimals to two decimal places.

### Key Vocabulary (in addition to previous year group):

hundredths, decimal, decimal fraction, decimal point, decimal place, decimal equivalent, proportion, mixed fraction, proper/improper fraction.

### Prior knowledge / skills this builds on:

- 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.
- Compare and order unit fractions and fractions with the same denominators.
- Add and subtract fractions with the same denominator within one whole [e.g.:  $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$ ].
- Solve problems that involve Y3 fraction skills learned.

### What comes next:

- Recognise mixed numbers and improper fractions and convert from one form to the other; write mathematical statements  $>1$  as a mixed number [e.g.:  $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1 \frac{1}{5}$ ].
- Identify name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.
- Compare and order fractions whose denominators are all multiples of the same number.
- 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 [e.g.:  $0.71 = \frac{71}{100}$ ].
- 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 numbers up to three decimal places.
- Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred'; write percentages as a fraction with denominator hundred, and as a decimal.
- 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 fractions with a denominator of a multiple of 10 or 25.

## YEAR 5 – Fractions, Decimals, Percentages

### Core knowledge to be acquired:

- Recognise mixed numbers and improper fractions and convert from one form to the other; write mathematical statements  $>1$  as a mixed number [e.g.:  $2/5 + 4/5 = 6/5 = 1\frac{1}{5}$ ].
- Identify name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.
- Compare and order fractions whose denominators are all multiples of the same number.
- 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 [e.g.:  $0.71 = 71/100$ ].
- 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 numbers up to three decimal places.
- Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred'; write percentages as a fraction with denominator hundred, and as a decimal.
- 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 fractions with a denominator of a multiple of 10 or 25.

### Prior knowledge / skills this builds on:

- Count up and down in hundredths; recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten.
- Recognise and show, using diagrams, families of common equivalent fractions.
- Add and subtract fractions with the same denominator.
- Recognise and write decimal equivalents to  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$ .
- Recognise and write decimal equivalents of any number of tenths or 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.
- 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.
- 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 simple measure and money problems involving fractions and decimals to two decimal places.

### Key Vocabulary (in addition to previous year group):

thousandths, percentage, per cent, %.

### What comes next:

- 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 [e.g.:  $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$ ].
- Divide proper fractions by whole numbers [e.g.:  $\frac{1}{3} \div 2 = \frac{1}{6}$ ].
- Associate a fraction with division to calculate decimal fraction equivalents (e.g.: 0.375) for a simple fraction [e.g.:  $\frac{3}{8}$ ].
- Identify the value of each digit 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.
- Solve problems involving the relative sizes of two quantities, where missing values can be found by using integer multiplication and division facts.
- Solve problems involving the calculation of percentages [e.g.: of measures such as 15% of 360] and the use of percentages for comparison.
- Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.

## YEAR 6 – Fractions, Decimals, Percentages, Ratio and Proportion

### Core knowledge to be acquired:

- 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 [e.g.:  $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$ ].
- Divide proper fractions by whole numbers [e.g.:  $\frac{1}{3} \div 2 = \frac{1}{6}$ ].
- Associate a fraction with division to calculate decimal fraction equivalents (e.g.: 0.375) for a simple fraction [e.g.:  $\frac{3}{8}$ ].
- Identify the value of each digit 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.
- Solve problems involving the relative sizes of two quantities, where missing values can be found by using integer multiplication and division facts.
- Solve problems involving the calculation of percentages [e.g.: of measures such as 15% of 360] and the use of percentages for comparison.
- Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.

### Key Vocabulary (in addition to previous year group):

proportion, in every, for every, ratio

### Prior knowledge / skills this builds on:

- Recognise mixed numbers and improper fractions and convert from one form to the other; write mathematical statements  $>1$  as a mixed number [e.g.:  $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1 \frac{1}{5}$ ].
- Identify name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.
- Compare and order fractions whose denominators are all multiples of the same number.
- 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 [e.g.:  $0.71 = \frac{71}{100}$ ].
- 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 numbers up to three decimal places.
- Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred'; write percentages as a fraction with denominator hundred, and as a decimal.
- 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 fractions with a denominator of a multiple of 10 or 25.

### What comes next:

#### Key Stage 3: Ratio, proportion and rates of change

- use scale factors, scale diagrams and maps.
- express one quantity as a fraction of another, where the fraction is less than 1 and greater than 1
- use ratio notation, including reduction to simplest form
- divide a given quantity into two parts in a given part:part or part:whole ratio; express the division of a quantity into two parts as a ratio
- understand that a multiplicative relationship between two quantities can be expressed as a ratio or a fraction
- relate the language of ratios and the associated calculations to the arithmetic of fractions and to linear functions
- solve problems involving percentage change, including: percentage increase, decrease and original value problems and simple interest in financial mathematics
- solve problems involving direct and inverse proportion, including graphical and algebraic representations
- use compound units such as speed, unit pricing and density to solve problems.