

# Unit overview: Fractions, Decimals & Percentages – Year 1

## National Curriculum requirements

By the end of the year, the children will be able 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.

## Vocabulary

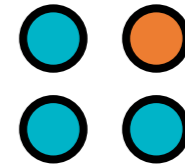
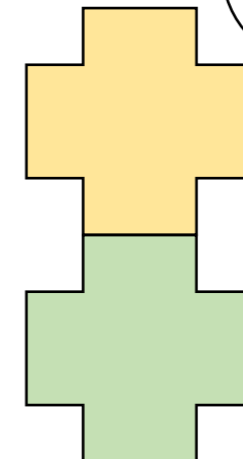
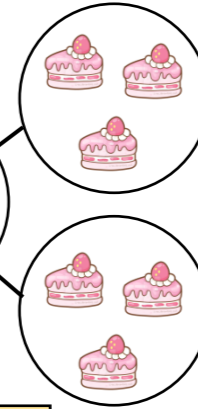
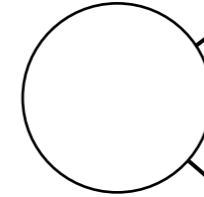
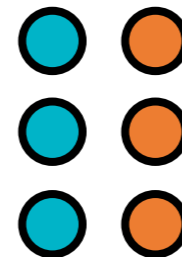
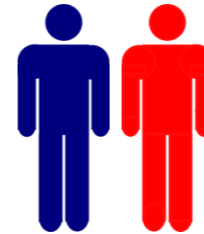
- fraction
- whole
- part
- equal
- half
- quarter

## Manipulatives

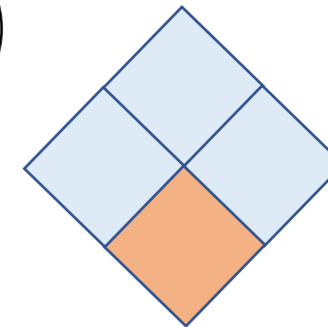
- counters
- dienes
- interlocking cubes
- toys

## Visual representations

$\frac{1}{2}$



$\frac{1}{4}$



## Sentence stems

A half is \_\_\_\_\_ One half of \_\_\_\_\_ is \_\_\_\_\_

I can find one half by \_\_\_\_\_

If I split this shape into two \_\_\_\_\_ parts, then I will have split it in \_\_\_\_\_

A quarter is \_\_\_\_\_ One quarter of \_\_\_\_\_ is \_\_\_\_\_

I can find one quarter by \_\_\_\_\_

If I split this shape into four \_\_\_\_\_ parts, then I will have split it into \_\_\_\_\_

There are \_\_\_\_\_ equal parts.

## Learning sequence

- recognise half of a shape or object as being two equal parts
- find half of an object by splitting it exactly in two pieces and using one of them
- find half of a quantity of objects to 10
- find half of a quantity to 100
- recognise a quarter of a shape or object as being one of four equal parts
- find a quarter of a shape or object by splitting it exactly in four pieces and using one of them
- find one quarter of a quantity such as 4, 8, 12, 16
- find a quarter of quantities to 100

# Unit overview: Fractions, Decimals & Percentages – Year 2

## National Curriculum requirements

By the end of the year, the children will be able 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  $\frac{1}{2}$

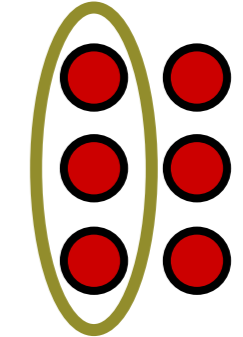
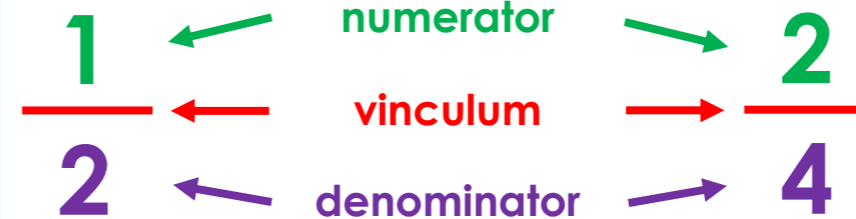
## Vocabulary

- fraction
- unit fraction
- non-unit fraction
- whole
- part
- equal
- half
- quarter
- third
- numerator
- denominator
- vinculum

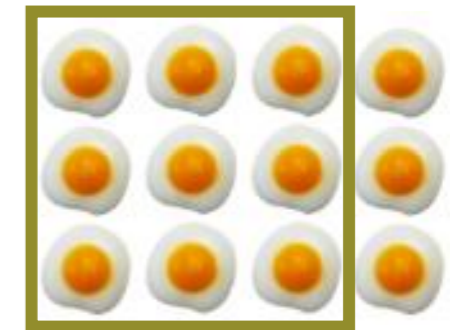
## Manipulatives

- counters
- dienes
- interlocking cubes
- number lines

## Visual representations



|                                 |                              |                              |                              |
|---------------------------------|------------------------------|------------------------------|------------------------------|
| 1 whole                         |                              |                              |                              |
| $\frac{1}{4}$<br>one quarter    | $\frac{1}{4}$<br>one quarter | $\frac{1}{4}$<br>one quarter | $\frac{1}{4}$<br>one quarter |
| $\frac{2}{4}$<br>two quarters   |                              | $\frac{1}{2}$<br>one half    |                              |
| $\frac{3}{4}$<br>three quarters |                              |                              | $\frac{1}{4}$<br>one quarter |



## Sentence stems

A half is \_\_\_\_\_ One half of \_\_\_\_\_ is \_\_\_\_\_

I can find one half by \_\_\_\_\_

If I split this shape into two \_\_\_\_\_ parts, then I will have split it in \_\_\_\_\_

A quarter is \_\_\_\_\_ One quarter of \_\_\_\_\_ is \_\_\_\_\_

I can find one quarter by \_\_\_\_\_

If I split this shape into four \_\_\_\_\_ parts, then I will have split it into \_\_\_\_\_

A third is \_\_\_\_\_ One third of \_\_\_\_\_ is \_\_\_\_\_

There are \_\_\_\_\_ equal parts.

## Learning sequence

- revise recognising, finding and naming one half and one quarter of an object, shape or quantity
- recognise and write down one third as a fraction
- recognise and write down one, two and three quarters as fractions
- represent one third, one quarter, two quarters, and three quarters
- find fractional portions of lengths of physical items such as string or lengths shown in diagrams
- split a group of physical or pictorial objects into fractional amounts of one third, one half or one quarter (and record this accurately)
- split a group of physical or pictorial objects into fractional amounts that are non-unit fractions; two thirds, two quarters and three quarters (and record this accurately)
- understand that different fractions can be equivalent; specifically that two quarters and one half are equivalent
- name two fractions that are equivalent and demonstrate through shading in equivalent fractions in pictures and showing equivalent fractions on a number line
- apply knowledge of fractions to solve simple problems based on quantities

# Unit overview: Fractions, Decimals & Percentages – Year 3

## National Curriculum requirements

By the end of the year, the children will be able 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,  $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$ ]
- compare and order unit fractions, and fractions with the same denominators
- solve problems that involve all of the above.

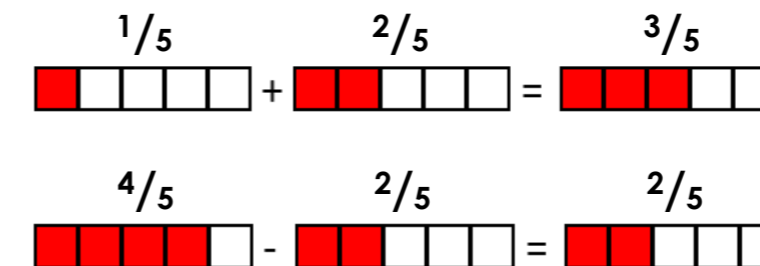
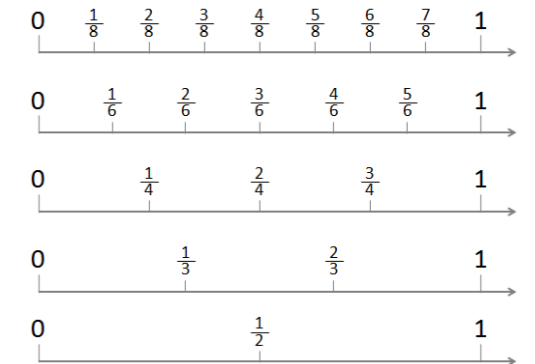
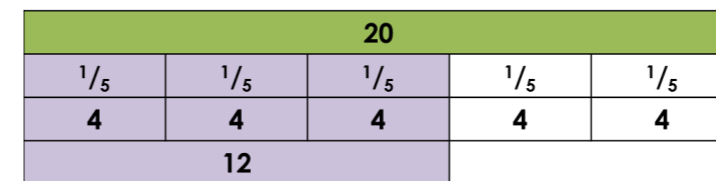
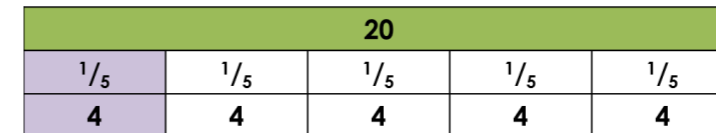
## Vocabulary

- fraction
- unit fraction
- non-unit fraction
- equivalent fraction
- whole
- part
- equal
- numerator
- denominator
- vinculum
- mixed numbers

## Manipulatives

- dienes
- interlocking cubes
- place value charts
- place value slider white boards

## Visual representations



## Sentence stems

There are \_\_\_\_\_ equal parts

The numerator is \_\_\_\_\_ The denominator is \_\_\_\_\_

The numerator shows \_\_\_\_\_

The denominator shows \_\_\_\_\_

I know that \_\_\_\_\_ is larger than \_\_\_\_\_ because \_\_\_\_\_

\_\_\_\_\_ is equivalent to \_\_\_\_\_ because \_\_\_\_\_

A unit fraction is \_\_\_\_\_ A non-unit fraction is \_\_\_\_\_

\_\_\_\_\_ added to \_\_\_\_\_ is equal to \_\_\_\_\_

## Learning sequence

- revision of finding, naming and writing the fractions  $\frac{1}{3}$ ,  $\frac{1}{4}$ ,  $\frac{2}{4}$  and  $\frac{3}{4}$  of a length, shape, set of objects or quantity, and equivalence of  $\frac{1}{2}$  and  $\frac{2}{4}$
- count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number
- 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
- recognising and writing fractions: link the number of equal parts to the value of the denominator; recognise that the number of 'shaded' parts gives the value of the numerator
- know that fractions can have a value of more than 1: use whole numbers and fractions (mixed numbers) to show how much of a group of shapes is shaded in
- find unit and non-unit fractions of amounts by splitting them into equal groups and combining as appropriate, e.g.  $\frac{1}{5}$  of 20 =  $\frac{1}{5} \times 20 = 4$ ;  $\frac{3}{5}$  of 20
- represent fraction additions using arrays and images
- represent fraction subtractions using arrays and images
- solve addition and subtraction fraction problems (with the same denominator and within one whole) using arrays and images
- compare and order unit fractions, and non-unit fractions with the same denominators
- recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators
- solve problems that involve fractions of a discrete set of objects, unit fractions and non-unit fractions with small denominators and equivalent fractions

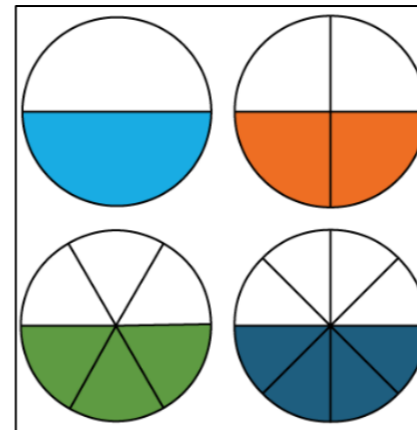
# Unit overview: Fractions, Decimals & Percentages – Year 4

## National Curriculum requirements

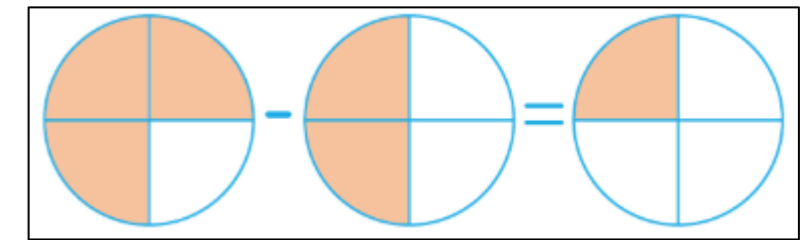
By the end of the year, the children will be able to:

- 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  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$
- 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.

## Visual representations



|               |      |               |      |
|---------------|------|---------------|------|
| 1             |      |               |      |
| $\frac{1}{4}$ | 0.25 | $\frac{1}{4}$ | 0.25 |



|                            |                            |                            |                            |                            |
|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| 80 whole                   |                            |                            |                            |                            |
| $\frac{1}{5}$<br>one fifth | $\frac{1}{5}$<br>one fifth | $\frac{1}{5}$<br>one fifth | $\frac{1}{5}$<br>one fifth | $\frac{1}{5}$<br>one fifth |
| ?                          |                            |                            |                            | $\frac{1}{5}$<br>one fifth |

## Sentence stems

There are \_\_\_\_\_ equal parts

The numerator is \_\_\_\_\_ The denominator is \_\_\_\_\_

The numerator shows \_\_\_\_\_

The denominator shows \_\_\_\_\_

I know that \_\_\_\_\_ is larger than \_\_\_\_\_ because \_\_\_\_\_

\_\_\_\_\_ is equivalent to \_\_\_\_\_ because \_\_\_\_\_

A unit fraction is \_\_\_\_\_ A non-unit fraction is \_\_\_\_\_

\_\_\_\_\_ added to \_\_\_\_\_ is equal to \_\_\_\_\_

\_\_\_\_\_ rounded to one decimal place is \_\_\_\_\_

The decimal equivalent of \_\_\_\_\_ is \_\_\_\_\_

## Vocabulary

- fraction
- unit fraction
- non-unit fraction
- equivalent fraction
- numerator
- denominator
- vinculum
- mixed numbers
- decimal
- decimal place
- tenths / hundredths
- round

## Manipulatives

- dienes
- interlocking cubes
- place value slider
- whiteboards
- number lines

## Learning sequence

- revision of fraction knowledge from Y1-3
- add and subtract fractions with the same denominator
- recognise and show, using diagrams, families of common equivalent fractions
- 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
- count up and down in hundredths; recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten
- recognise and write decimal equivalents of any number of tenths or hundredths
- compare numbers with the same number of decimal places up to two decimal places
- recognise and write decimal equivalents to  $\frac{1}{4}$ ;  $\frac{1}{2}$ ;  $\frac{3}{4}$
- round decimals with one decimal place to the nearest whole number
- 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 units, tenths and hundredths
- solve simple measure and money problems involving fractions and decimals to two decimal places

# Unit overview: Fractions, Decimals & Percentages – Year 5



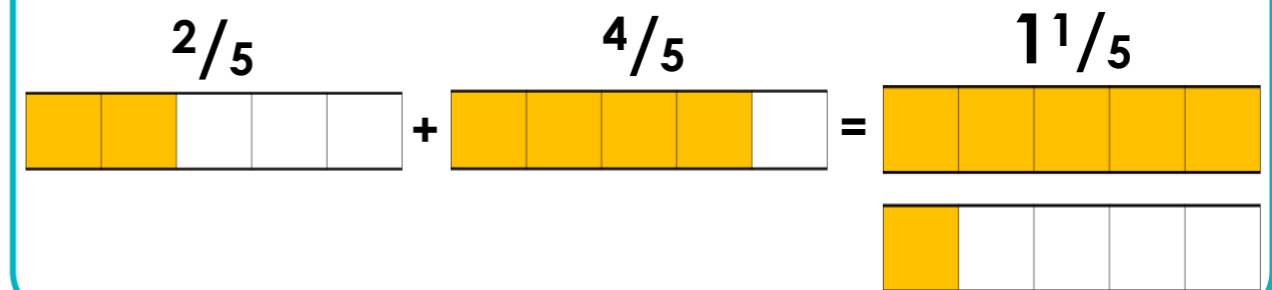
## National Curriculum requirements

By the end of the year, the children will be able 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,  $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$ ]
- 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,  $0.71 = \frac{71}{100}$ ]
- 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 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  $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{1}{5}$ ,  $\frac{2}{5}$ ,  $\frac{4}{5}$  and those fractions with a denominator of a multiple of 10 or 25.

## Visual representations

| PERCENTAGE | FRACTION      | DECIMAL |
|------------|---------------|---------|
| 20%        | $\frac{1}{5}$ | 0.2     |
| 40%        | $\frac{2}{5}$ | 0.4     |
| 60%        | $\frac{3}{5}$ | 0.6     |
| 80%        | $\frac{4}{5}$ | 0.8     |



## Sentence stems

There are \_\_\_\_\_ equal parts

The numerator is \_\_\_\_\_ The denominator is \_\_\_\_\_

The numerator shows \_\_\_\_\_

The denominator shows \_\_\_\_\_

An improper fraction is \_\_\_\_\_

I know that \_\_\_\_\_ is larger than \_\_\_\_\_ because \_\_\_\_\_

\_\_\_\_\_ is equivalent to \_\_\_\_\_ because \_\_\_\_\_

A unit fraction is \_\_\_\_\_ A non-unit fraction is \_\_\_\_\_

\_\_\_\_\_ added to \_\_\_\_\_ is equal to \_\_\_\_\_

\_\_\_\_\_ rounded to one decimal place is \_\_\_\_\_

The decimal equivalent of \_\_\_\_\_ is \_\_\_\_\_

## Vocabulary

- fraction
- unit fraction
- non-unit fraction
- equivalent fraction
- improper fraction
- mixed number
- numerator
- denominator
- vinculum
- mixed numbers
- decimal
- decimal place
- tenths / hundredths
- round
- percent

## Manipulatives

- dienes
- interlocking cubes
- place value slider
- whiteboards
- number lines

## Learning sequence

- 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
- read, write, order and compare numbers with up to three decimal places
- multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
- round decimals with two decimal places to the nearest whole number and to one decimal place
- compare and order fractions whose denominators are 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 (e.g.  $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$ )
- 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
- 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 hundred, and as a decimal fraction
- 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

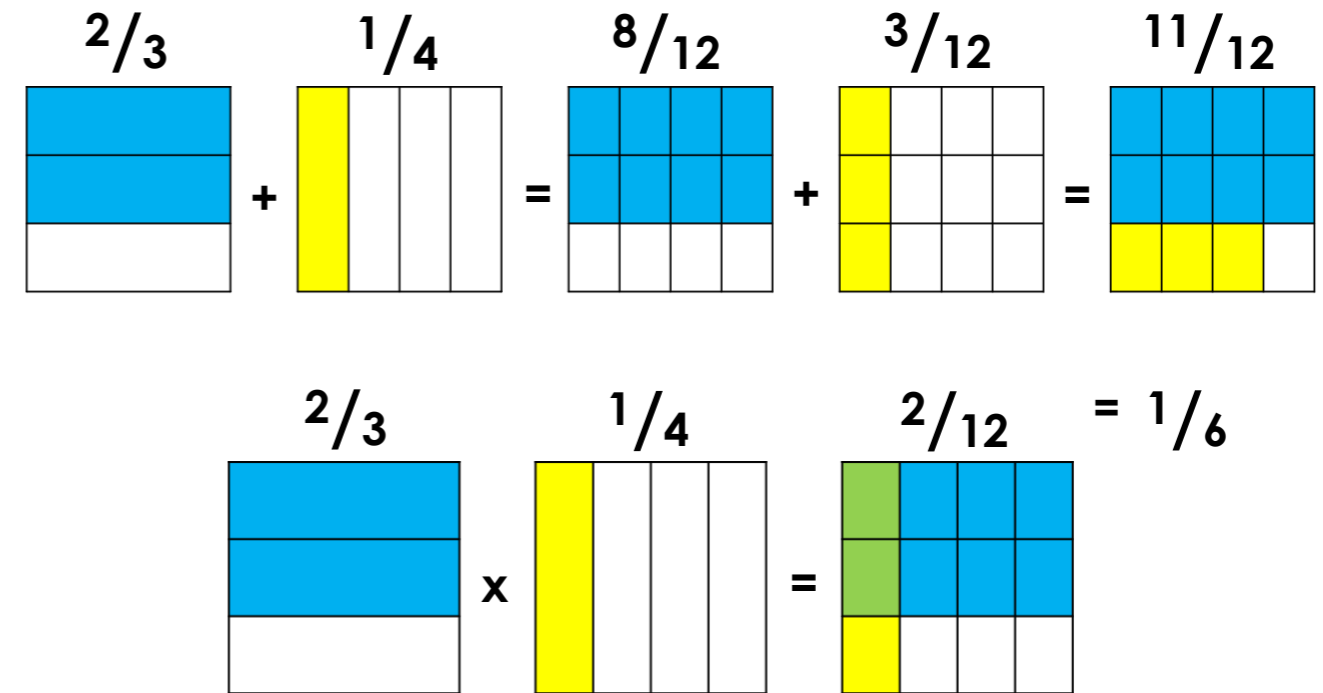
# Unit overview: Fractions, Decimals & Percentages – Year 6

## National Curriculum requirements

By the end of the year, the children will be able 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,  $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$ ]
- divide proper fractions by whole numbers [for example,  $\frac{1}{3} \div 2 = \frac{1}{6}$ ]
- associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example,  $\frac{3}{8}$ ]
- 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.

## Visual representations



## Sentence stems

The numerator shows \_\_\_\_\_

The denominator shows \_\_\_\_\_

An improper fraction is \_\_\_\_\_

I know that \_\_\_ is larger than \_\_\_ because \_

\_\_\_\_\_ is equivalent to \_\_\_\_\_ because \_\_\_\_\_

A unit fraction is \_\_\_; a non-unit fraction is

\_\_\_\_\_ added to \_\_\_\_\_ is equal to \_\_\_\_\_

\_\_\_\_\_ rounded to one decimal place is \_\_\_\_\_

The decimal equivalent of \_\_\_\_\_ is \_\_\_\_\_

A percentage is \_\_\_\_\_

## Vocabulary

- fraction
- unit fraction
- non-unit fraction
- equivalent fraction
- improper fraction
- mixed number
- numerator
- denominator
- vinculum
- mixed numbers
- decimal
- decimal place
- tenths / hundredths
- round
- percent

## Manipulatives

- interlocking cubes
- place value slider
- whiteboards

## Learning sequence

- 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
- identify common factors, common multiples and prime numbers
- compare and order fractions, including fractions  $> 1$
- use common factors to simplify fractions; use common multiples to express fractions in the same denomination
- add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
- order and compare equivalent fractions
- recall and use equivalences between simple fractions, decimals and percentages, including in different contexts
- associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example,  $\frac{3}{8}$ ]
- understand that per cent relates to “number of parts per hundred”, and write percentages as a fraction with denominator hundred, and as a decimal fraction
- order and compare fractions, decimals and percentages
- multiply simple pairs of proper fractions, writing the answer in its simplest form [for example  $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$ ]: demonstrating understanding through pictorial representations
- divide proper fractions by whole numbers [for example,  $\frac{1}{3} \div 2 = \frac{1}{6}$ ]
- 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