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.

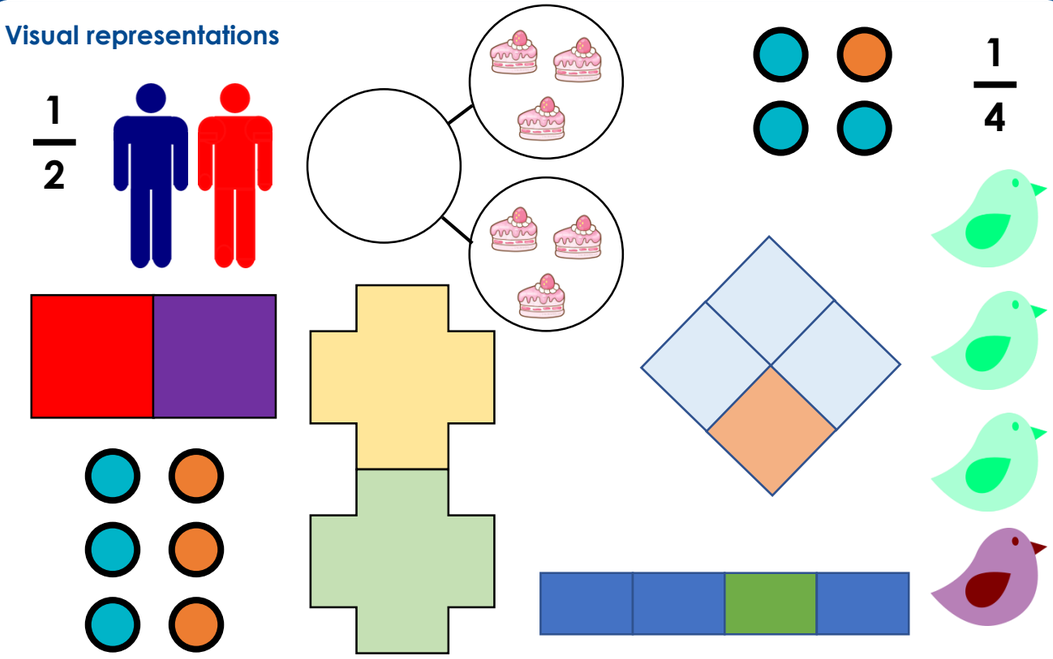
Vocabulary

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

Manipulatives

- counters
- dienes
- interlocking cubes
- toys

Visual representations



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 $^1/_3$, $^1/_4$, $^2/_4$ and $^3/_4$ of a length, shape, set of objects or quantity
- write simple fractions for example, $^1/_2$ of 6 = 3 and recognise the equivalence of $^2/_4$ and $^1/_2$

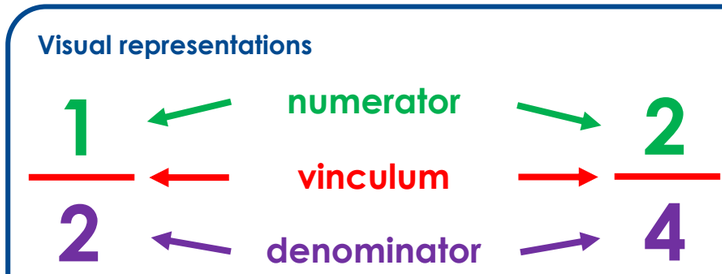
Vocabulary

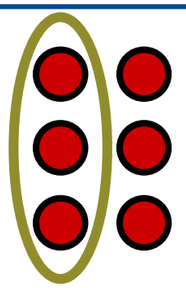
- fraction
- unit fraction
- non-unit fraction
- whole
- part
- equal
- half
- quarter
- third
- numerator
- denominator
- vinculum

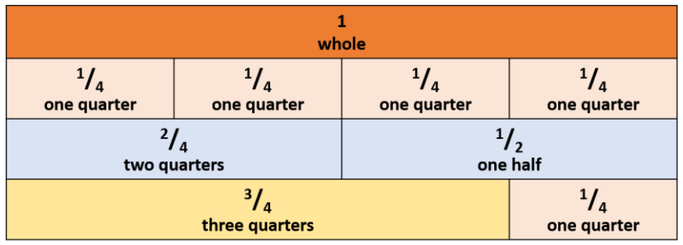
Manipulatives

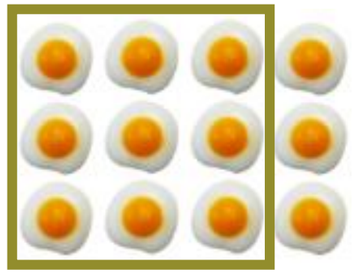
- counters
- dienes
- interlocking cubes
- number lines

Visual representations









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, $^5/_7 + {}^1/_7 = {}^6/_7$]
- compare and order unit fractions, and fractions with the same denominators
- solve problems that involve all of the above.

Vocabulary

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

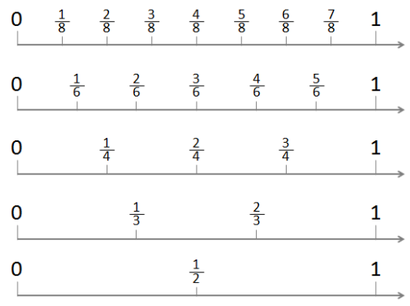
Manipulatives

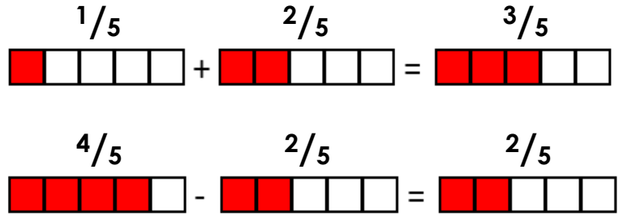
- dienes
- interlocking cubes
- place value charts
- place value slider white boards

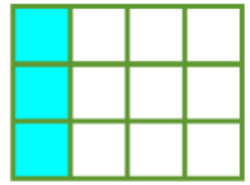
Visual representations

20				
$^1/_5$	$^1/_5$	$^1/_5$	$^1/_5$	$^1/_5$
4	4	4	4	4

20				
$^1/_5$	$^1/_5$	$^1/_5$	$^1/_5$	$^1/_5$
4	4	4	4	4
12				







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 $^1/_3$, $^1/_4$, $^2/_4$ and $^3/_4$ of a length, shape, set of objects or quantity, and equivalence of $^1/_2$ and $^2/_4$
- 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. $^1/_5$ of 20 = $^1/_5$ x 20 = 4; 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

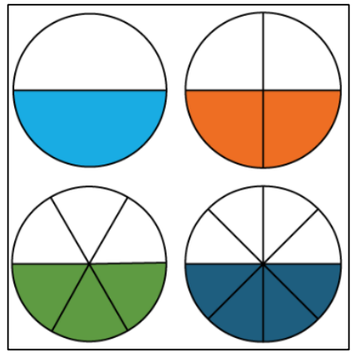
Unit overview: Fractions, Decimals & Percentages – Year 4

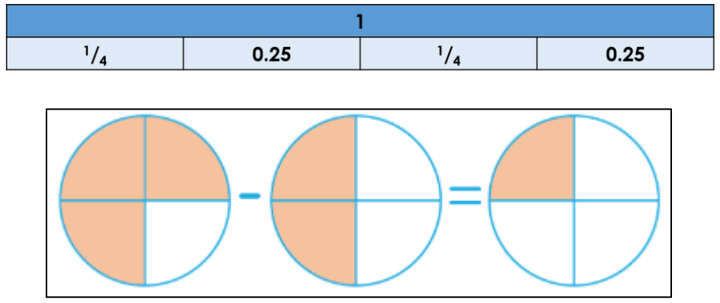
National Curriculum requirements

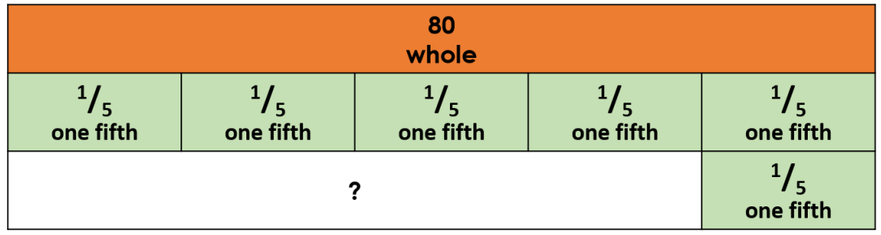
By the end of the year, the children will be able to:

- 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 $^1/_4$, $^1/_2$, $^3/_4$
- 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







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 $^1/_4$; $^1/_2$; $^3/_4$
- 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

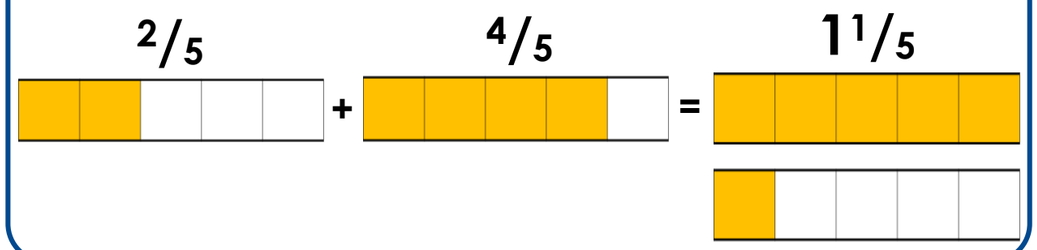
National Curriculum requirements

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, $^2/_5 + ^4/_5 = ^6/_5 = 1^1/_5$]
- 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 $^1/_2$, $^1/_4$, $^1/_5$, $^2/_5$, $^4/_5$ 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 = $^{71}/_{100}$)
- 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. $^2/_5 + ^4/_5 = ^6/_5 = 1^1/_5$)
- 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
- 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 1/2, 1/4, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25

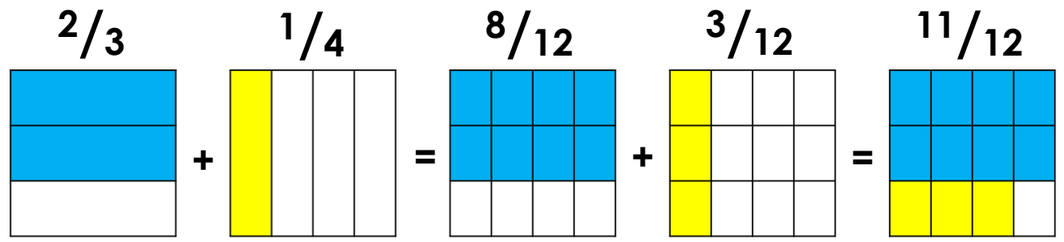
Unit overview: Fractions, Decimals & Percentages – Year 6

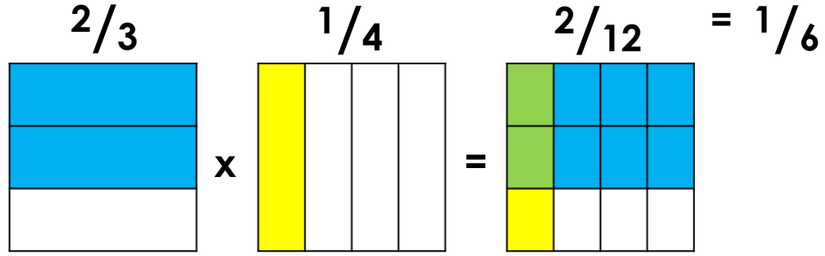
National Curriculum requirements

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, $^1/_4 \times {}^1/_2 = {}^1/_8$]
- divide proper fractions by whole numbers [for example, $^1/_3 \div 2 = {}^1/_6$]
- 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.

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, $^3/_8$]
- 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 $^1/_4 \times {}^1/_2 = {}^1/_8$): demonstrating understanding through pictorial representations
- divide proper fractions by whole numbers [for example, $^1/_3 \div 2 = {}^1/_6$]
- 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