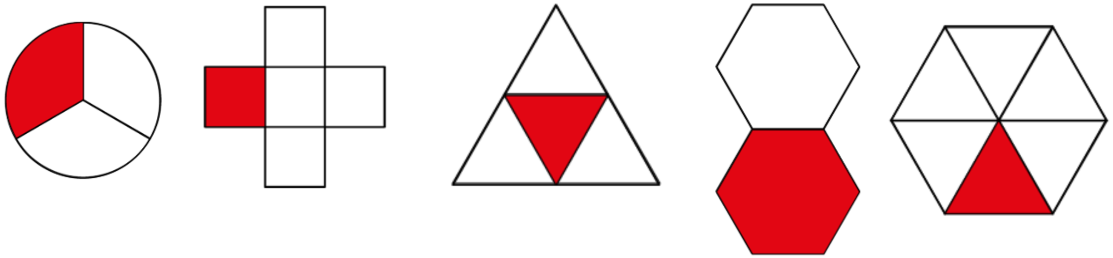
Fractions

Year 3

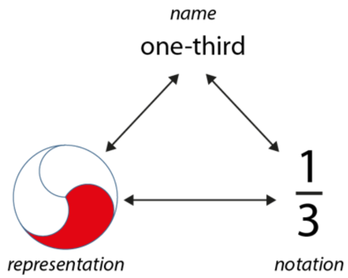
Use and Understand Fraction Notation

Vocabulary:

Fraction Notation Divided Equal Numerator Denominator Whole Parts Fraction Bar (Vinculum) Half Third Quarter Fifth Sixth Seventh Eighth Ninth Tenth



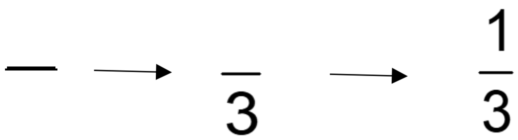
Make connections between the representation, the notation and the name.



Understand that a fraction is a part of a whole using a range of representations.

There whole has been divided into ___ equal parts.

___ of the parts has been shaded in.



The whole has been divided…

…into 3 equal parts…

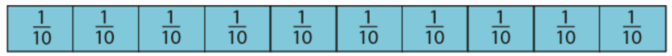
…there is one part shaded.

When writing a fraction, we write the division bar (vinculum) first, then the denominator and then the numerator.

Generalise:

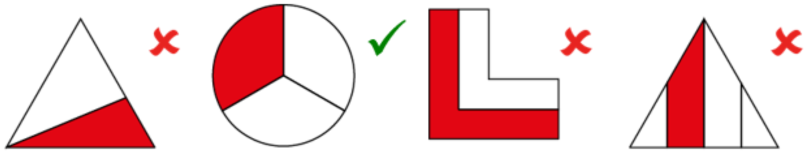
The numerator tells us the number of parts shaded.

The denominator tells us the number of equal parts the whole has been split into.



10 one-tenths = ten-tenths

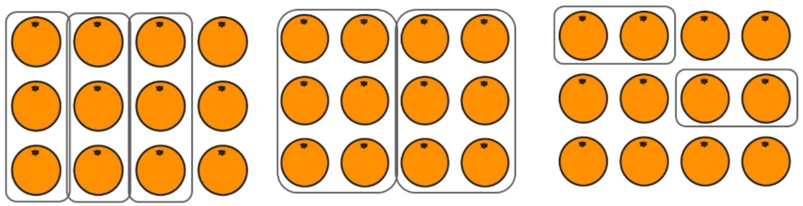
Understand that we can describe fractions in two ways:



Is $\frac{1}{2}$ shaded? Is $\frac{1}{3}$ shaded? Is $\frac{1}{2}$ shaded? Is $\frac{1}{4}$ shaded?

Develop understanding through reasoning about non-examples aswell.

Recognise the numerators and denominators in different types of wholes and when divided differently.



Fractions

Year 3

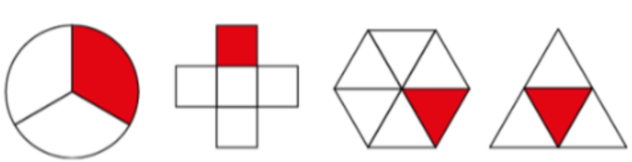
Find Unit Fractions of Quantities (1)

Vocabulary:

Fraction Notation Divided Equal Numerator Denominator Whole Parts
Fraction Bar (Vinculum) Half Third Quarter Fifth Sixth Seventh Eighth
Ninth Tenth One-_____ Bar Model Equation Expression Linear Volume
Area Quantity Times as much / Times the size of

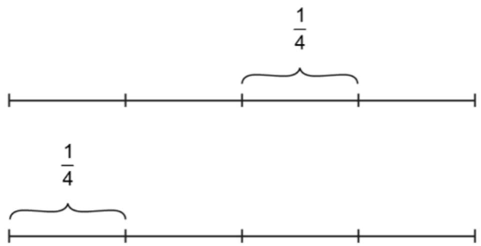
We can use fraction notation to record unit fractions in different contexts including:

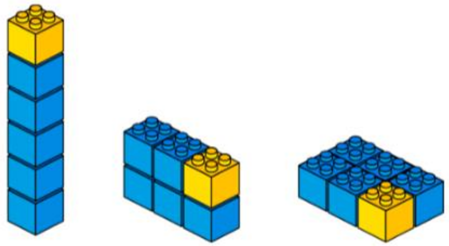
Area contexts



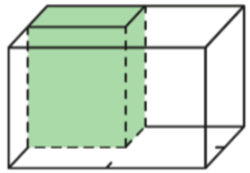
$\frac{1}{3}$	$\frac{1}{5}$	$\frac{1}{6}$	$\frac{1}{4}$	$\frac{1}{2}$
one-third	one-fifth	one-sixth	one-quarter	one-half

Linear contexts

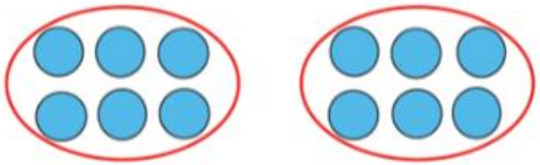




Volume contexts



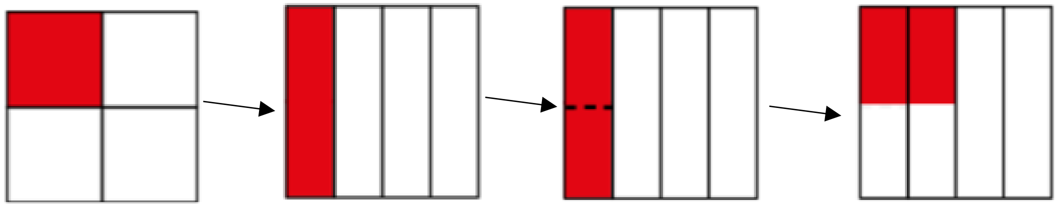
Quantity contexts



The whole is ____. The whole has been divided into __ equal parts.

Each part is $\frac{1}{}$ of the whole.

$\frac{1}{}$ of __ is __.



Generalisation:

Equal parts don't always look the same.

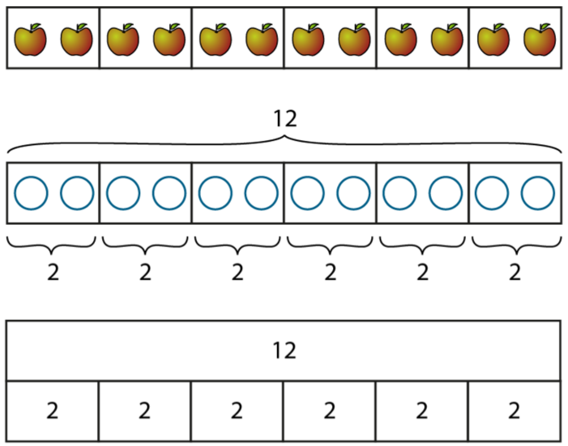
Fractions

Year 3

Find Unit Fractions of Quantities (2)

Vocabulary:

Fraction Notation Divided Equal Numerator Denominator Whole Parts Fraction Bar (Vinculum) Half Third Quarter Fifth Sixth Seventh Eighth Ninth Tenth One-_____ Bar Model Equation Expression Linear Volume Area Quantity Times as much / Times the size of



12 ÷ 6 = 2 $\frac{1}{6}$ **of 12 = 2**

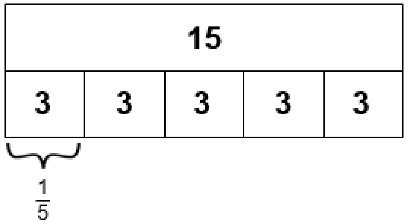
We can division facts to help us find the fraction of an amount, representing this use bar models.

To find $\frac{1}{5}$ of 15, we divide 15 into 5 equal parts.

15 divided by 5 is equal to 3,

so $\frac{1}{5}$ of 15 is 3.

$\frac{1}{5}$ **of 15**



15 ÷ 5 = 3

so $\frac{1}{5}$ of 15 = 3

The whole is 12 apples. The whole has been divided into 6 equal parts.

Each part is $\frac{1}{6}$ of the whole.

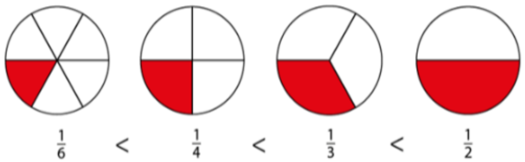
$\frac{1}{6}$ of 12 apples is 2 apples.

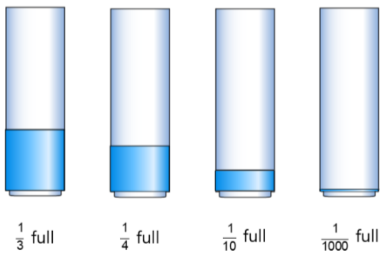
We can compare fractions with the same numerator. We can compare these in different contexts.

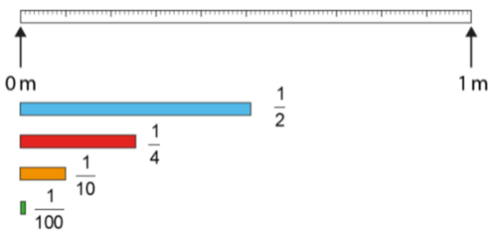
Generalisation:

When both fractions have the same numerator, the greater the denominator, the greater the fraction.

When we compare fractions, the whole must be the same.







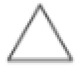
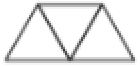
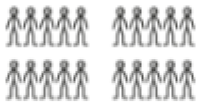
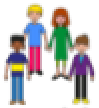
Fractions

Year 3

Find Unit Fractions of Quantities (3)

Vocabulary:

Fraction Notation Divided Equal Numerator Denominator Whole Parts
Fraction Bar (Vinculum) Half Third Quarter Fifth Sixth Seventh Eighth
Ninth Tenth One-_____ Bar Model Equation Expression Linear Volume
Area Quantity Times as much / Times the size of

Part	Part as a fraction of the whole	Number of equal parts in the whole	Whole
	$\frac{1}{3}$	3	
	$\frac{1}{5}$	5	
	$\frac{1}{4}$	4	
	$\frac{1}{5}$	5	
	$\frac{1}{7}$	7	

If we know the size of the unit fraction, we can work out the size of the whole.

The whole is divided into ___ equal parts. Each part is ___ of the whole.

If one-___ is a part, then the whole is ___ times as much. Take ___ parts and put them together to make one whole.

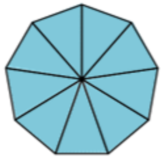
Fractions

Year 3

Fractions within 1 in the Linear Number System.

Vocabulary:

Fraction Notation Divided Equal Numerator Denominator Whole Parts
Fraction Bar (Vinculum) Half Third Quarter Fifth Sixth Seventh Eighth
Ninth Tenth One-_____ Linear Number Line Bar Model Vertical Horizontal

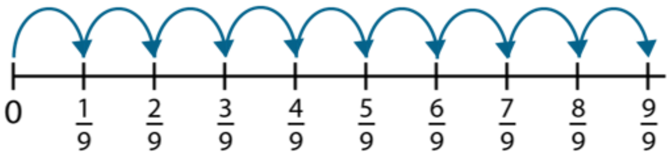


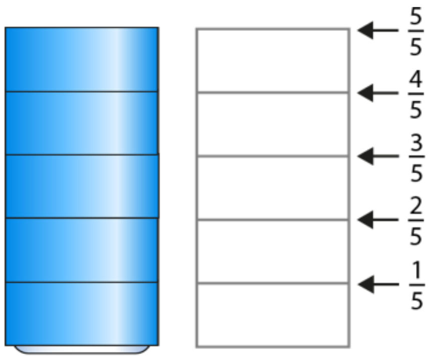
$\frac{9}{9}$

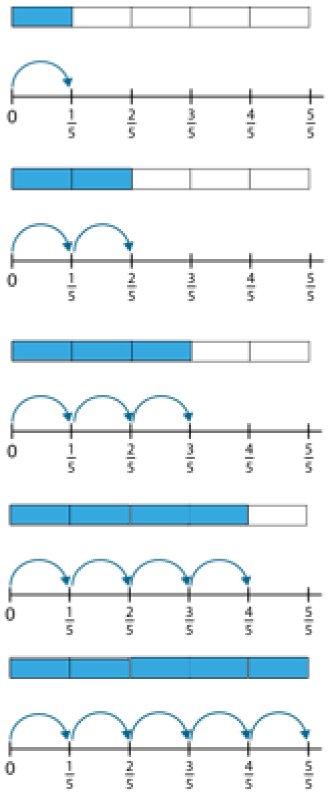
We can represent fractions on both horizontal and vertical number lines.

The whole is divided into ___ equal parts. Each part is ___ of the whole.

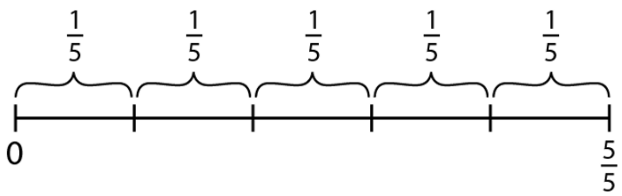
The whole is made up of 9 one-ninths.



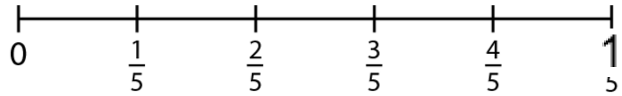




Fractions as part of a whole



Fractions as numbers



Fractions should be seen as part of a whole and as numbers which have their own unique place on a number line.

Generalisation:

When the numerator and denominator are the same, the fraction has a value of 1.

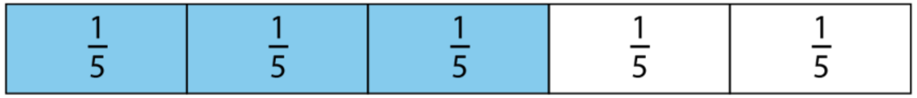
Fractions

Year 3

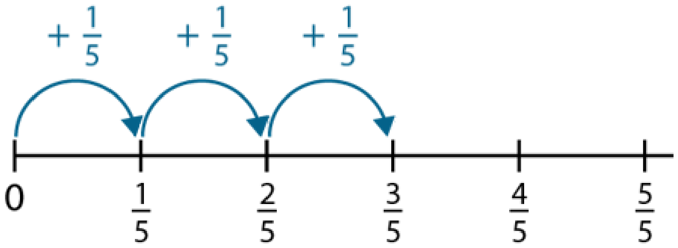
Add and Subtract Fractions within 1

Vocabulary:

Fraction Notation Divided Equal Numerator Denominator Whole Parts Fraction Bar (Vinculum) Half Third Quarter Fifth Sixth Seventh Eighth Ninth Tenth One-______ Add Subtract Number line Bar model Equation Expression



$$\frac{1}{5} + \frac{1}{5} + \frac{1}{5} = \frac{3}{5}$$



We can add multiples of the unit fraction and record this as an addition equation.

The unit fraction is one-fifth. There are three one-fifths in three-fifths.

Three-fifths is made up of one-fifth, add another one-fifth, and another one-fifth.

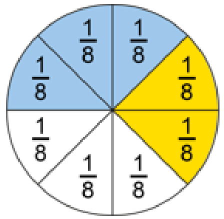
We can use our knowledge of addition and subtraction structures to add/subtract non-unit fractions, recording these as equations.

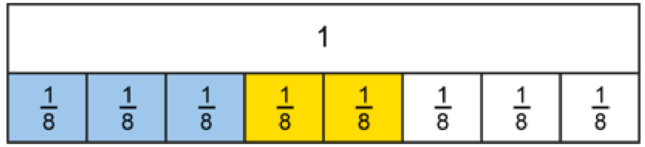
3 one-eighths plus 2 one-eighths is equal to 5 one-eighths.

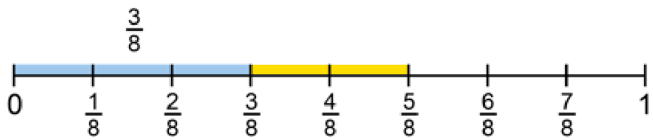
Three-eighths, plus two-eighths is equal to five-eighths.

5 one eighths minus 2 one-eighths is equal to 3 one-eighths.

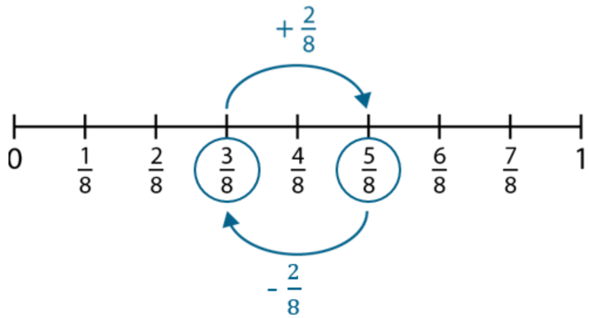
Five-eighths, minus two-eighths is equal to three-eighths.







$$\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$$



$$\frac{5}{8} - \frac{2}{8} = \frac{3}{8}$$

Fractions

Year 3

Add and Subtract Fractions within 1

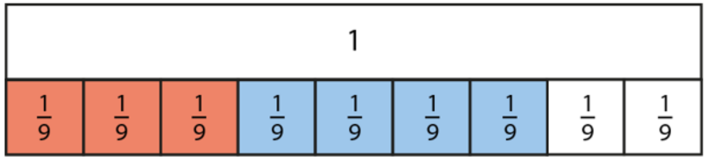
Vocabulary:

Fraction Notation Divided Equal Numerator Denominator Whole Parts Fraction Bar (Vinculum) Half Third Quarter Fifth Sixth Seventh Eighth Ninth Tenth One-______ Add Subtract (Minus) Number line Bar model Equation Expression

We can use one of three methods to represent our understanding of adding and subtracting fractions with the same denominator.

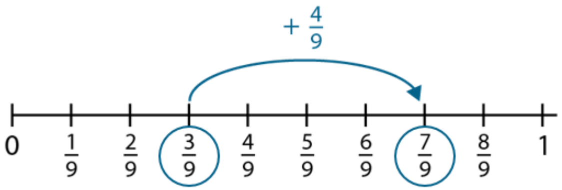
1 – Use a Diagram

***Note – this may best represent an aggregation (adding with) addition structure.**



2 – Use a Number Line

***Note – this may best represent an augmentation (adding to) addition structure.**



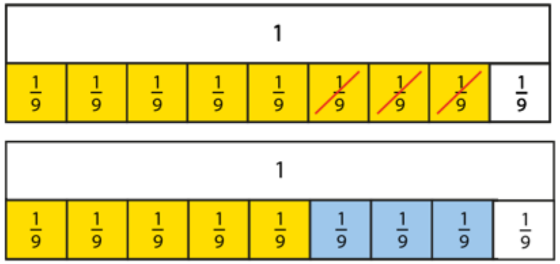
3 – Verbal reasoning

$\frac{3}{9}$ is 3 lots of $\frac{1}{9}$

$\frac{4}{9}$ is 4 lots of $\frac{1}{9}$

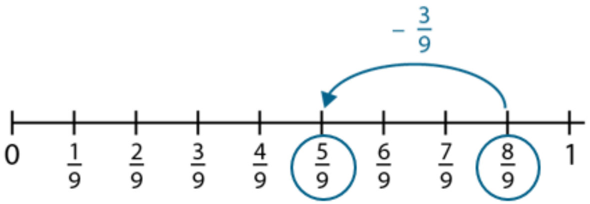
I know that $3 + 4 = 7$

So I know that $\frac{3}{9} + \frac{4}{9} = \frac{7}{9}$



***Note – this may best represent a reductive (take away) subtraction structure.**

***Note – this may best represent a partitioning (separation) subtraction structure.**



***Note – this may best represent a partitioning (separation) subtraction structure.**

$\frac{8}{9}$ is 8 lots of $\frac{1}{9}$

$\frac{3}{9}$ is 3 lots of $\frac{1}{9}$

$8 - 3 = 5$

So $\frac{8}{9} - \frac{3}{9}$ is $\frac{5}{9}$

Generalisation:

When adding/subtracting fractions with the same denominator, just add/subtract the numerators.

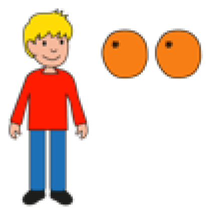
Fractions

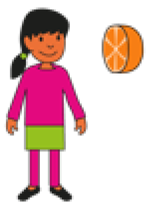
Year 4

Mixed Numbers in the Linear Number System

Vocabulary:

Fraction Notation Divided Equal Numerator Denominator Whole Parts
Fraction Bar (Vinculum) Half Third Quarter Fifth Sixth Seventh Eighth
Ninth Tenth One-_____ Add Subtract (Minus) Number line Part-Part-Whole
Model Units Previous Next Estimate Intervals



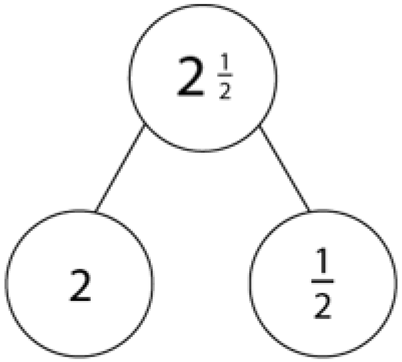


Quantities that are made up of both wholes and parts are called Mixed Numbers.

There are two whole oranges. There is half an orange. There are two and a half oranges altogether.

There are more than two whole oranges.

There are less than three whole oranges.



We can place Mixed Numbers on a number line.

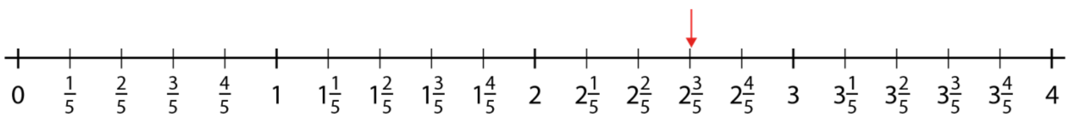
There are ___ parts between zero and one. This means we are counting in units of ___.

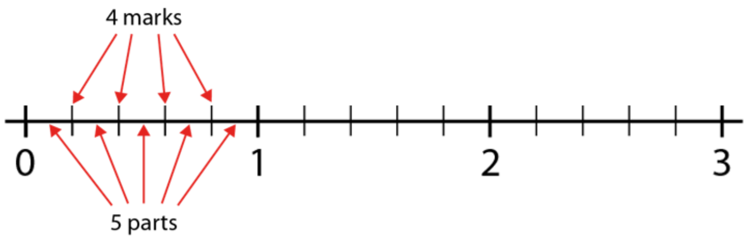
The line is divided into ___ equal parts. This means we are counting in ___s.

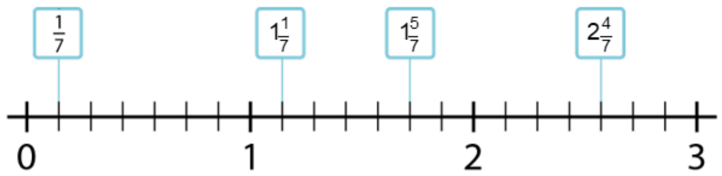
We can use our knowledge of ordering proper fractions to order Mixed Numbers.

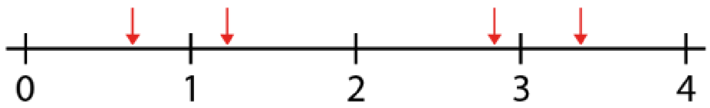
$1\frac{1}{7}$ is between 1 and 2. The previous number is 1. The next number is 2.

We can use our knowledge of placing mixed numbers on a number line to estimate the position of a Mixed Number on a blank number line.









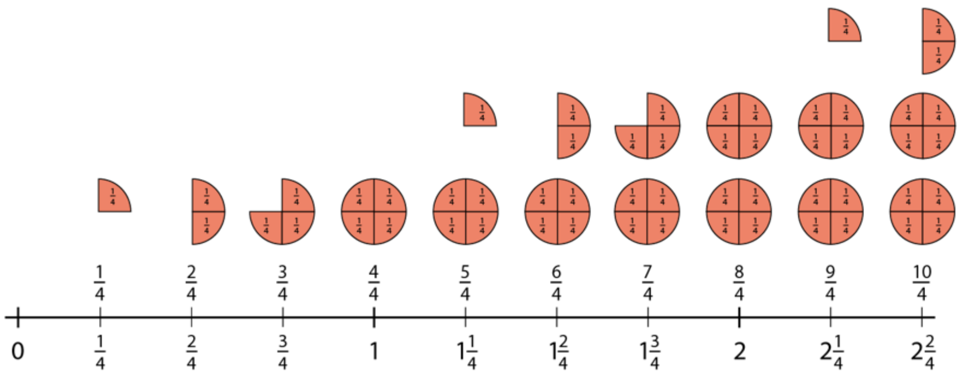
Fractions

Year 4

Convert between Mixed Numbers and Improper Fractions

Vocabulary:

Fraction Notation Divided Equal Numerator Denominator Whole Parts Fraction Bar (Vinculum) Half Third Quarter Fifth Sixth Seventh Eighth Ninth Tenth One-_____ Number line Part-Part-Whole Model Units Previous Next Estimate Intervals Convert Improper Fractions Mixed Numbers



We can count in unit fractions over 1 whole and record this as either a Mixed Number or an Improper Fraction.

We can dual count to support this:

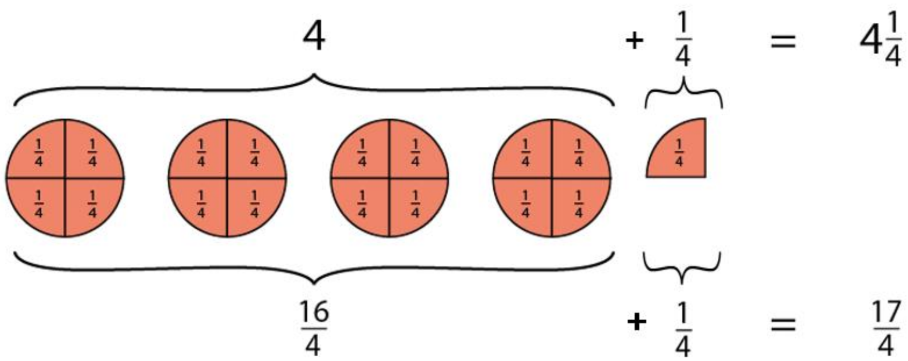
1 quarter, 2 quarter, 3 quarters, 4 quarters, 5 quarters …

1 quarter, 2 quarter, 3 quarters, 1 whole, 1 whole and 1 quarter…

1 group of 4 quarters is 1 whole

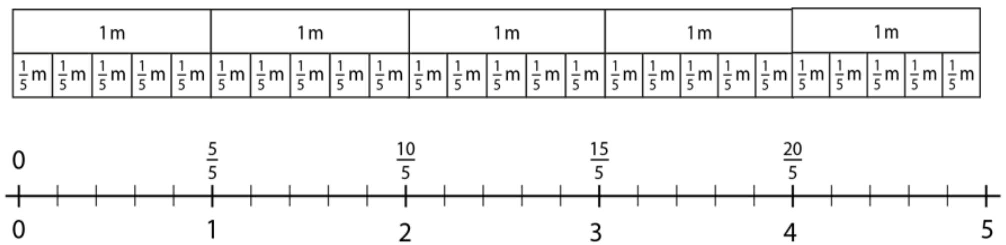
2 groups of 4 quarters in 2 wholes

3 groups of 4 quarters is 3 wholes



There are __ groups of 4 quarters which is __ quarters, and __ more quarters, so that is __ quarters in total.

This counting can be connected to wider contexts including measures.



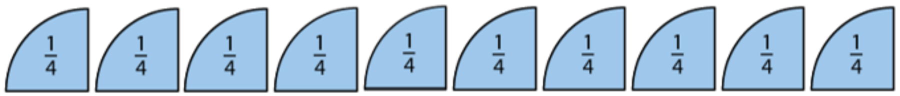
Fractions

Year 4

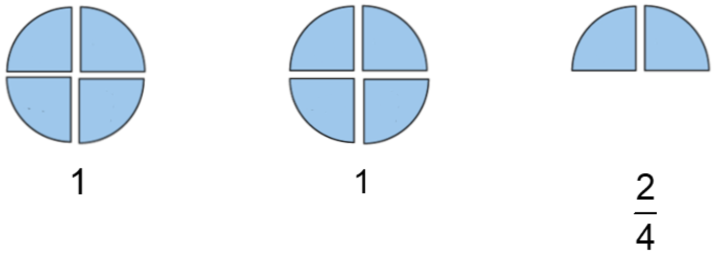
Convert between Mixed Numbers and Improper Fractions

Vocabulary:

Fraction Notation Divided Equal Numerator Denominator Whole Parts Fraction Bar (Vinculum) Half Third Quarter Fifth Sixth Seventh Eighth Ninth Tenth One-_____ Number line Part-Part-Whole Model Units Previous Next Estimate Intervals Convert Improper Fractions Mixed Numbers



$$\frac{10}{4}$$



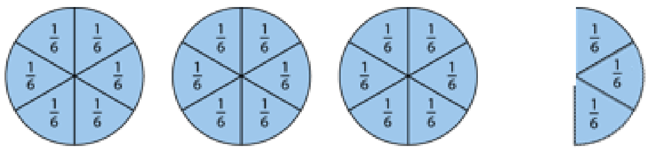
$$\frac{10}{4} = 2\frac{2}{4}$$

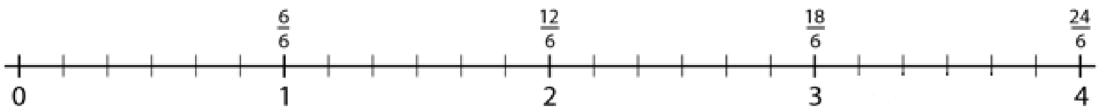
We can convert between Improper Fractions and Mixed Numbers by thinking about the counting unit.

Our unit is quarters so we will be thinking about groups of 4.

There are __ groups of four quarters which is ___-quarters, and ___ more quarters, so that is ___-quarters.

How many groups of 4 quarters in 10 quarters?





We can convert between Improper Fractions and Mixed Numbers by thinking about the counting unit.

Each whole has been divided into ___ equal parts. We have __ of these equal parts. This represents ___ ___s.

This knowledge can be connected to wider contexts including area, quantities, linear and volumes.

Generalise:

If we multiply the number of wholes by the denominator, we can find the value of the numerator.

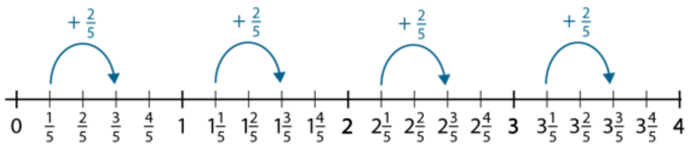
Fractions

Year 4

Add and Subtract Improper Fractions and Mixed Fractions (Same Denominator) (1)

Vocabulary:

Fraction Notation Divided Equal Numerator Denominator Whole Parts Fraction Bar (Vinculum) Half Third Quarter Fifth Sixth Seventh Eighth Ninth Tenth One-______ Number line Part-Part-Whole Model Units Previous Next Estimate Intervals Convert Improper Fractions Mixed Numbers Add Subtract (Minus)

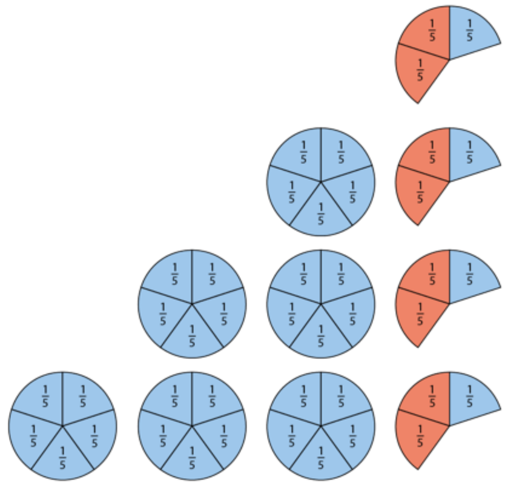


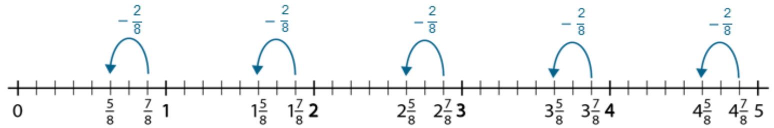
$\frac{1}{5} + \frac{2}{5} = \frac{3}{5}$

$1\frac{1}{5} + \frac{2}{5} = 1\frac{3}{5}$

$2\frac{1}{5} + \frac{2}{5} = 2\frac{3}{5}$

$3\frac{1}{5} + \frac{2}{5} = 3\frac{3}{5}$





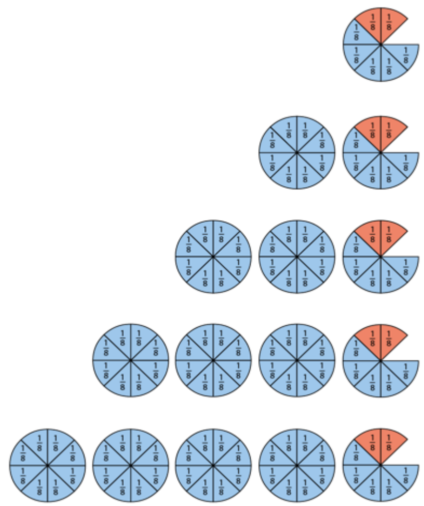
$\frac{7}{8} - \frac{2}{8} = \frac{5}{8}$

$1\frac{7}{8} - \frac{2}{8} = 1\frac{5}{8}$

$2\frac{7}{8} - \frac{2}{8} = 2\frac{5}{8}$

$3\frac{7}{8} - \frac{2}{8} = 3\frac{5}{8}$

$4\frac{7}{8} - \frac{2}{8} = \boxed{4\frac{5}{8}}$



We can apply our understanding of adding fractions within one with the same denominator to adding a mixed number and fractions within one with the same denominators.

The parts are __ and __. The total, or whole, is __.

We can apply our understanding of subtracting fractions within one with the same denominator to subtract a fraction within one from a mixed number with the same denominators.

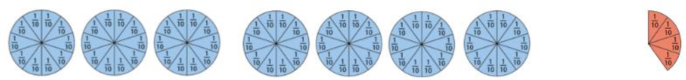
The total, or whole, is __. One part is __. The missing part is ___.

When adding combined mixed numbers and fractions within one, we combine the parts and then combine the wholes.

The parts are __ and __. The total, or whole, is __.

$\frac{1}{10} + 3\frac{2}{10} + 4 + \frac{1}{10}$

$\frac{1}{10}$ + $3\frac{2}{10}$ + 4 + $\frac{1}{10}$



$7\frac{4}{10}$

Fractions

Year 4

Add and Subtract Improper Fractions and Mixed Fractions (Same Denominator) (2)

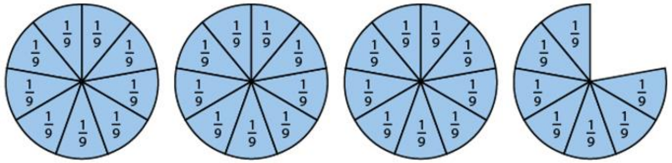
Vocabulary:

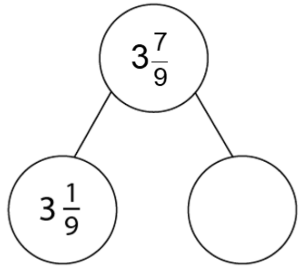
Fraction Notation Divided Equal Numerator Denominator Whole Parts Fraction Bar (Vinculum) Half Third Quarter Fifth Sixth Seventh Eighth Ninth Tenth One-_____ Number line Part-Part-Whole Model Units Previous Next Estimate Intervals Convert Improper Fractions Mixed Numbers Add Subtract (Minus)

When subtracting fractions within one from a mixed number, we subtract the fraction to reveal the missing part. We can use a part-whole model to help represent this.

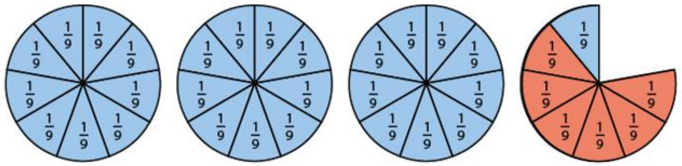
The total, or whole, is __. One part is __. The missing part is ___.

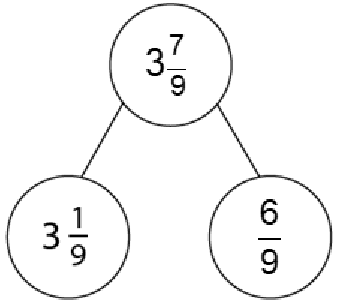
$$3\frac{7}{9} - \boxed{} = 3\frac{1}{9}$$





$$3\frac{7}{9} - \boxed{\frac{6}{9}} = 3\frac{1}{9}$$





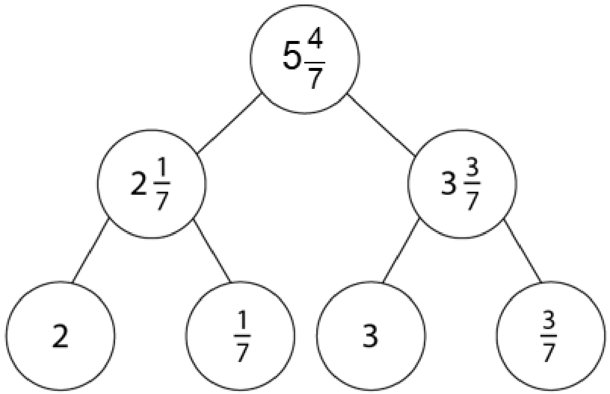
Generalisations:

When adding fractions with the same denominator, just add the numerators.

When subtracting fractions with the same denominator, just subtract the numerators.

Representing addition and subtraction of mixed numbers and fractions within one, using a part-whole model can be helpful when problem solving.

The parts are __ and __. The total, or whole, is __.



Fractions

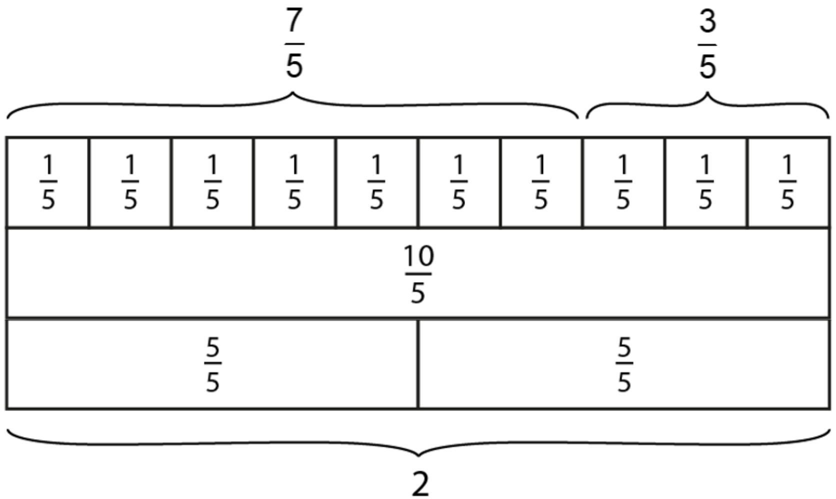
Year 4

Add and Subtract Improper Fractions and Mixed Fractions

(Same Denominator) (3)

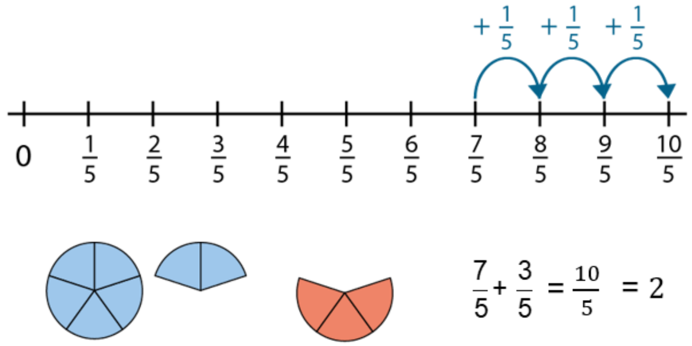
Vocabulary:

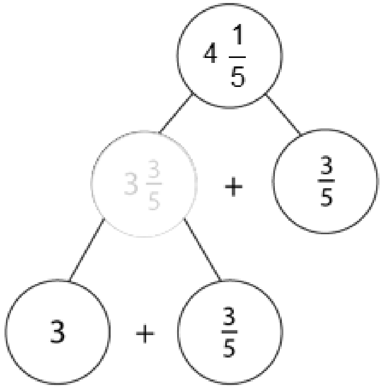
Fraction Notation Divided Equal Numerator Denominator Whole Parts Fraction Bar (Vinculum) Half Third Quarter Fifth Sixth Seventh Eighth Ninth Tenth One-_____ Number line Part-Part-Whole Model Units Previous Next Estimate Intervals Convert Improper Fractions Mixed Numbers Add Subtract (Minus)



We can apply our understanding of unitising and converting between improper fractions and mixed numbers when adding improper fractions.

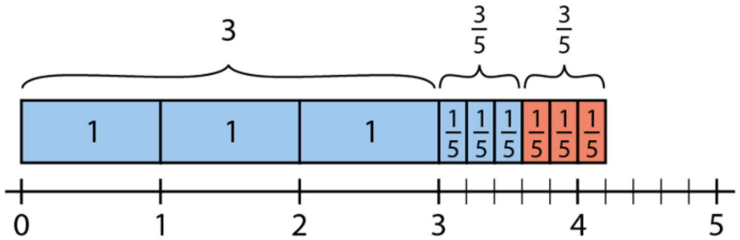
7 one-fifths and 3 one-fifths is equal to 10 one-fifths.





Partitioning a mixed number and then adding the fractional parts is helpful when adding mixed numbers with fractions within one that result in bridging over a whole.

3 one-fifths and 3 one-fifths is equal to 6 one-fifths. This is equal to one whole and 1 one-fifth.



Fractions

Year 4

Add and Subtract Improper Fractions and Mixed Fractions (Same Denominator) (4)

Vocabulary:

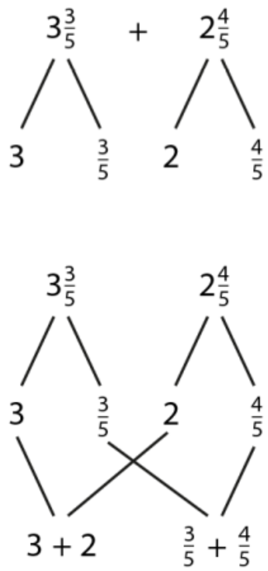
Fraction Notation Divided Equal Numerator Denominator Whole Parts Fraction Bar (Vinculum) Half Third Quarter Fifth Sixth Seventh Eighth Ninth Tenth One-_____ Number line Part-Part-Whole Model Units Previous Next Estimate Intervals Convert Improper Fractions Mixed Numbers Add Subtract (Minus) Aggregation Augmentation Reduction Partitioning Difference

Counting all (aggregation) strategy.

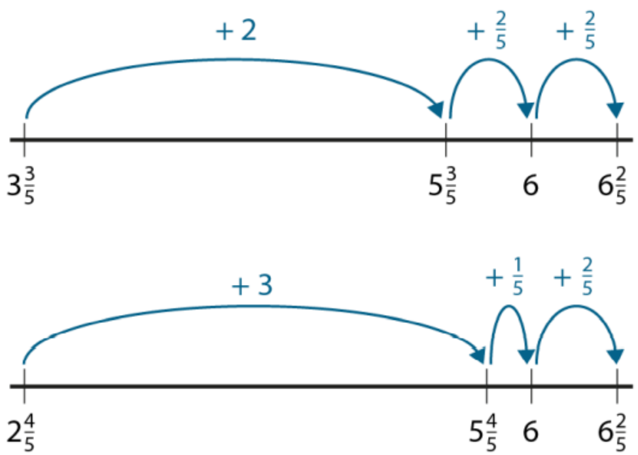
Counting on (augmentation) strategy.

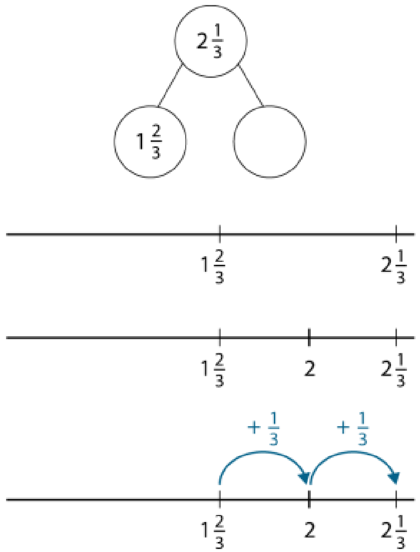
$$3\frac{3}{5} + 2\frac{4}{5} =$$

When adding two mixed numbers which bridge a whole, we can apply either a counting on (augmentation) or counting all (aggregation) strategy.

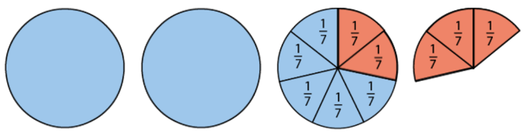


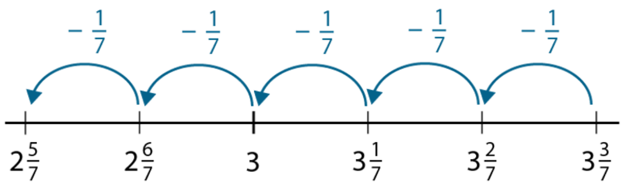
$5\frac{7}{5}$



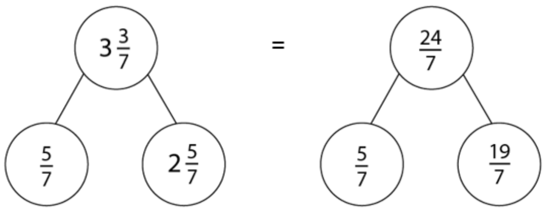


$3\frac{3}{7} - \frac{5}{7}$

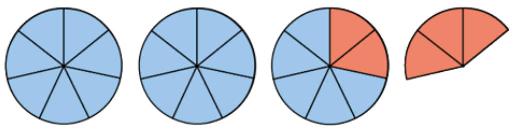




We can subtract a fraction from a mixed number with the same denominator using our awareness of converting between mixed numbers and improper fractions.



$3\frac{3}{7} - \frac{5}{7} = 2\frac{5}{7}$



We can also subtract a fraction from a mixed number with the same denominator using our understanding of subtraction as finding the difference.

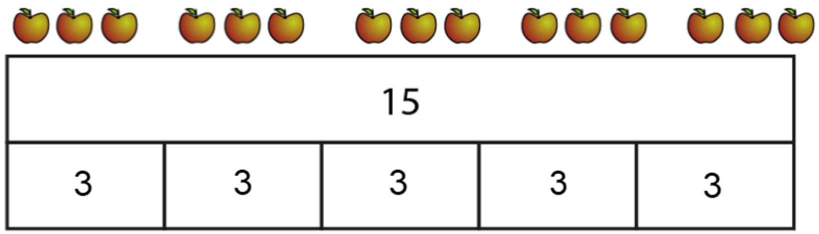
Fractions

Year 5

Find Non-Unit Fractions of Quantities.

Vocabulary:

Fraction Notation Divided Equal Numerator Denominator Whole Parts Fraction Bar (Vinculum) Half Third Quarter Fifth Sixth Seventh Eighth Ninth Tenth One-_____ Number line Part-Part-Whole Model Units Previous Next Estimate Intervals Convert Improper Fractions Mixed Numbers Add Subtract (Minus) Aggregation Augmentation Reduction Partitioning Difference



$\frac{1}{5}$ of 15 = 3

$\frac{2}{5}$ of 15 = 6

$\frac{3}{5}$ of 15 = 9

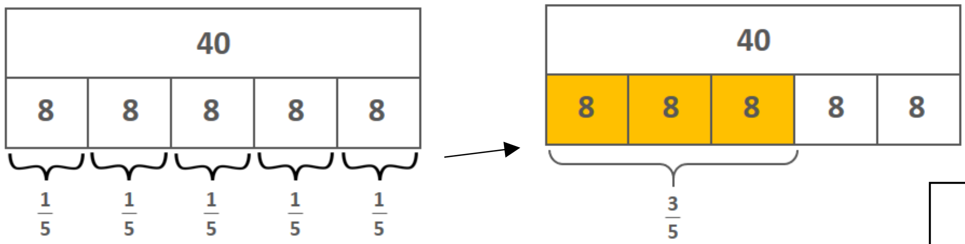
$\frac{4}{5}$ of 15 = 12

$\frac{5}{5}$ of 15 = 15

We can skip count in unit fractions to help us find the quantity of a non-unit fraction.

2 one-fifths of 15 is equal to 6,

3 one-fifths of 15 is equal to 9…



40 ÷ 5 = 8

so $\frac{1}{5}$ of 40 = 8

40 ÷ 5 = 8

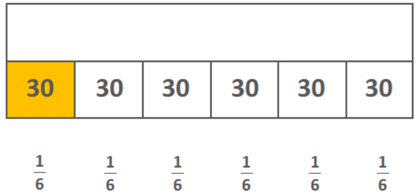
so $\frac{1}{5}$ of 40 = 8

$\frac{3}{5}$ of 40 = 24

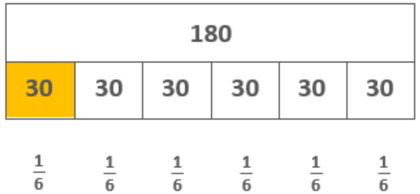
If the whole is unknown but we know the quantity of one part – we can find the size of the whole.

One-sixth of a number is equal to thirty.
6 one-sixths is equal to one whole.

To find the whole, multiply the value of 1 one-sixth by 6.



$\frac{1}{6}$ of a number is 30



$\frac{1}{6}$ of a number is 30

6 × 30 = 180

We can skip count in unit fractions to help us find the quantity of a non-unit fraction.

To find 3 one-fifths of 40, first find one-fifth of 40 by dividing by 5, and then multiply by 3.

Generalisation:

Divide the whole by the denominator and then multiply quotient by the numerator.

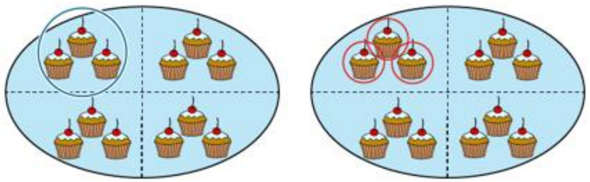
Fractions

Year 5

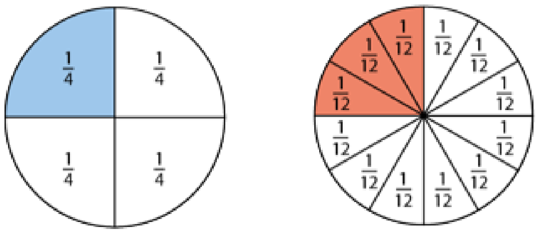
Find Equivalent Fractions

Vocabulary:

Fraction Notation Divided Equal Numerator Denominator Whole Parts Fraction Bar (Vinculum) Half Third Quarter Fifth Sixth Seventh Eighth Ninth Tenth One-_____ Number line Intervals Convert Portion Proportional Relationship Equivalent Vertical Horizontal



$$\frac{1}{4} \qquad \frac{3}{12}$$



Quantities can be expressed by more than one fraction.

The whole is divided into 4 equal parts and 1 of those parts is circled.

The whole is divided into 12 equal parts and 3 of those parts are circled.

$\frac{1}{4}$ and $\frac{3}{12}$ are equivalent because 1 is the same portion of 4 as 3 is of 12.

$$\frac{1}{4} = \frac{3}{12}$$

Investigate the proportional relationship between the numerator and denominator in each individual fraction.

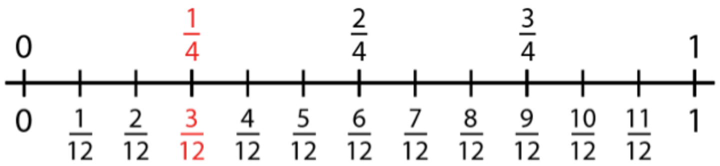
Investigate the proportional relationship between the numerators in both fractions and the denominators in both fractions.

The denominator is five times larger than the numerator. (Vertical relationship)

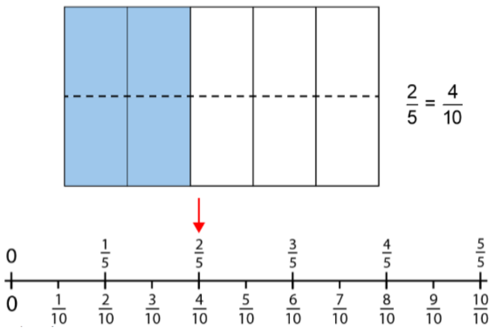
The numerator and denominator of the second fraction are both __ times greater than the first fraction. This means that the fractions are equivalent. (Horizontal relationship)

$$\times 4 \quad \frac{1}{4} = \frac{3}{12} \quad \times 4$$

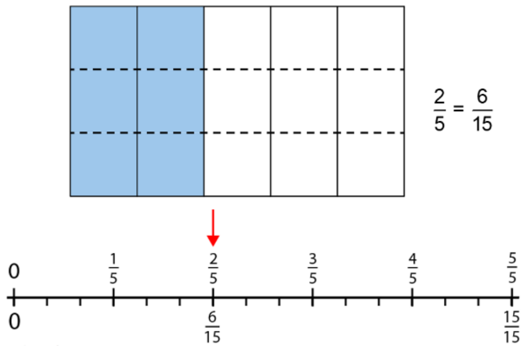
$$\frac{1}{4} \xrightarrow{\times 3} \frac{3}{12}$$



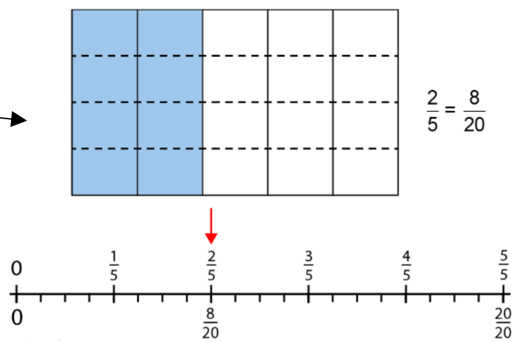
Continue to show how the same whole can be divided into different sized equal parts and how these can be seen as equivalent.



$\frac{2}{5} = \frac{4}{10}$



$\frac{2}{5} = \frac{6}{15}$



$\frac{2}{5} = \frac{8}{20}$

Fractions

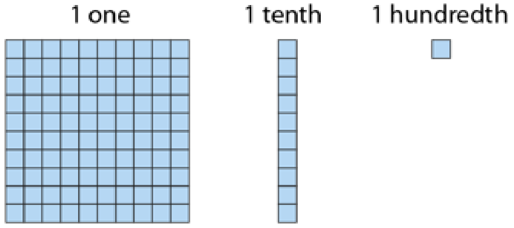
Year 5

Recall Decimal Equivalents for Common Fractions (1)

Vocabulary:

Fraction Notation Divided Equal Numerator Denominator Whole Parts
Fraction Bar (Vinculum) Half Quarter Fifth Tenth One-_____ Number line
Greater than Less than Multiple Common Partitions Previous Next
Estimate Intervals Convert Decimal Fraction One Tenths Hundredths

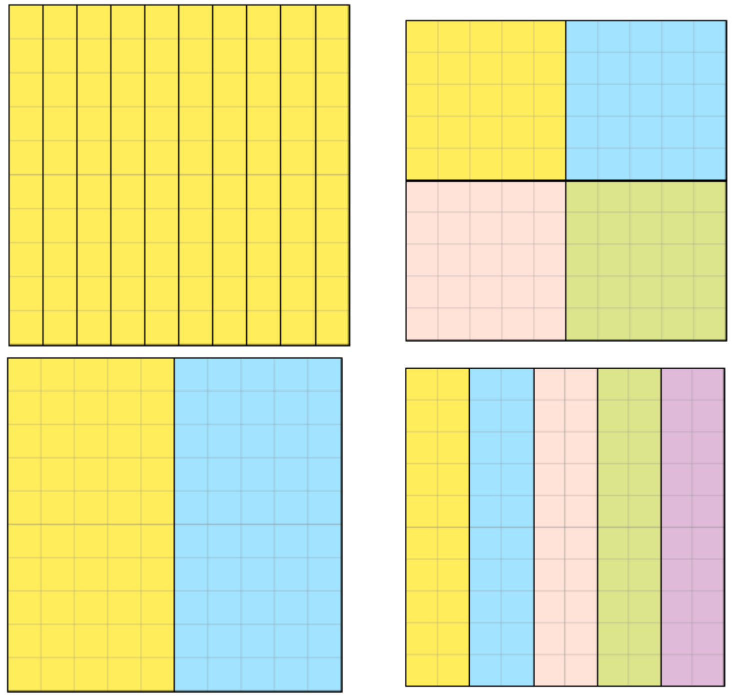
Use dienes to represent one whole and the corresponding size of one-tenth and one-hundredth.



Fraction notation	Decimal notation	Name
$\frac{1}{10}$	0.1	one-tenth
$\frac{1}{100}$	0.01	one-hundredth

We can use our knowledge of splitting 100 into common partitions and apply this to splitting a whole, made up of 100ths into common partitions.

I know __ and __ are equivalent because if the hundred grid is split into __ equal parts there would be __ hundredths in each part.

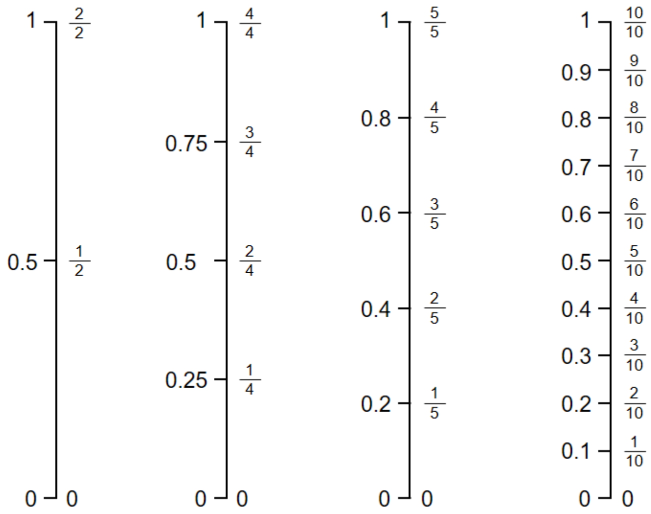


Count forward and backwards on a number line recognising the position of each decimal fraction.

0, 0.5, 1   1, 0.5, 0

Zero, one-half, two-halves.

Two-halves, one-half, zero



Unit fraction	Decimal fraction
$\frac{1}{2}$	0.5
$\frac{1}{4}$	0.25
$\frac{1}{5}$	0.2
$\frac{1}{10}$	0.1

Fractions

Year 5

Recall Decimal Equivalents for Common Fractions (2)

Vocabulary:

Fraction Notation Divided Equal Numerator Denominator Whole Parts
Fraction Bar (Vinculum) Half Quarter Fifth Tenth One-_____ Number line
Greater than Less than Multiple Common Partitions Previous Next
Estimate Intervals Convert Decimal Fraction One Tenths Hundredths

$$0.6 < \frac{4}{5}$$

$$0.6 = \frac{3}{5}$$

$$\frac{3}{5} < \frac{4}{5}$$

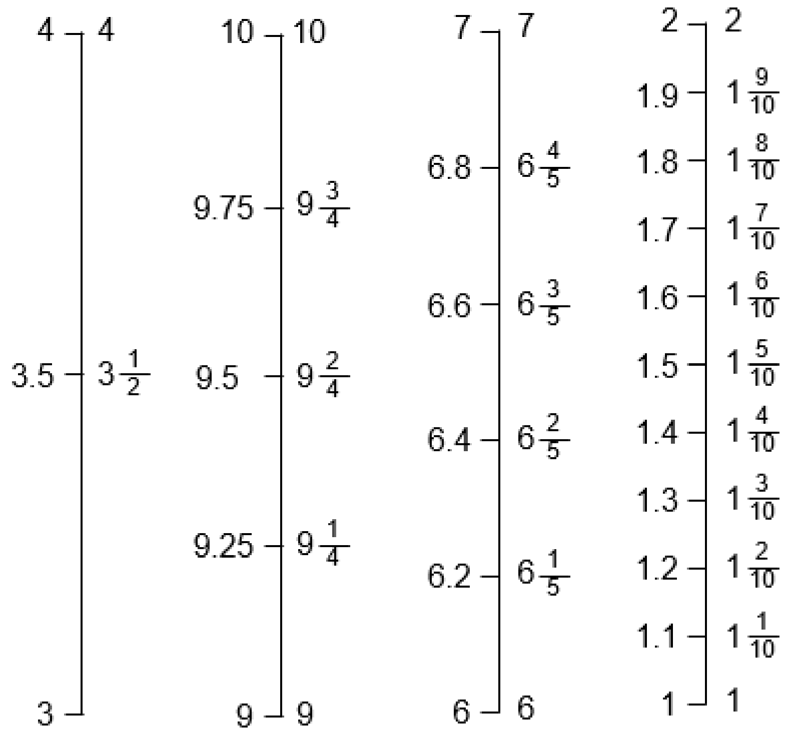
Use understanding of fractional equivalents in order to reason about the comparative size of decimals and fractions.

If I know 0.6 = $\frac{3}{5}$

and I know $\frac{3}{5} < \frac{4}{5}$,

then I know 0.6 < $\frac{4}{5}$.

Recognise the positioning of a decimal fraction and their equivalent fractional notation between numbers greater than 1.



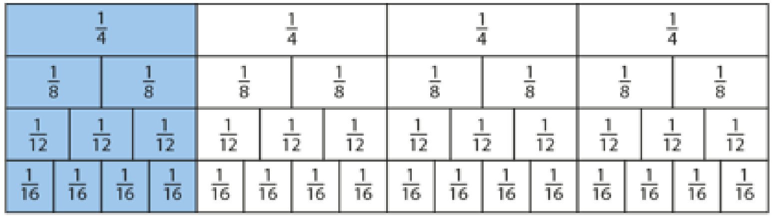
Fractions

Year 6

Simplify Fractions

Vocabulary:

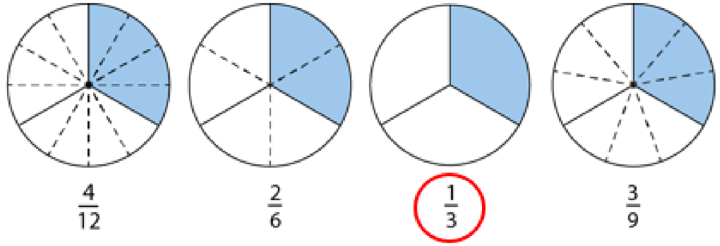
Fraction Notation Divided Equal Numerator Denominator Whole Parts
Fraction Bar (Vinculum) Half Third Quarter Fifth Sixth Seventh Eighth
Ninth Tenth One-_____ Multiple Factor Common Simplify Simplest Form
Mixed Number Improper Fraction Highest Common Factor

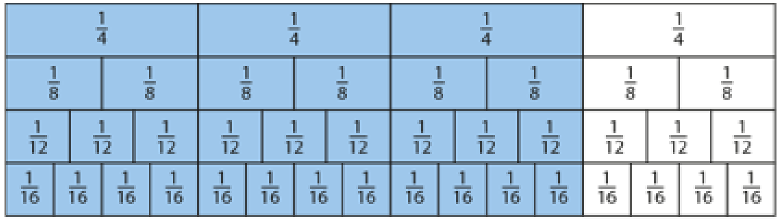


$$\frac{1}{4} = \frac{2}{8} = \frac{3}{12} = \frac{4}{16}$$

Recap equivalent fractions with multiple representations. Identify a fraction in its simplest form when the only common multiple of both the numerator and denominator is 1.

$\frac{1}{4}$ is in its simplest form. I know this because the only common factor of the numerator and the denominator is 1.

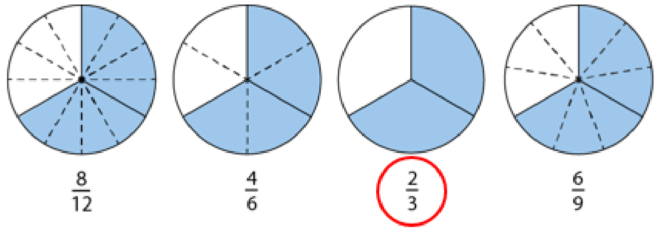




$$\frac{3}{4} = \frac{6}{8} = \frac{9}{12} = \frac{12}{16}$$

Extend to fractions where the numerator in the simplest form is greater than 1.

$\frac{3}{4}$ is in its simplest form. I know this because the only common factor of the numerator and the denominator is 1.



$$\overset{\div 4}{\underset{\div 4}{\frac{4}{12} = \frac{1}{3}}} \qquad \overset{\div 2}{\underset{\div 2}{\frac{4}{12} = \frac{2}{6}}} \qquad \overset{\div 1}{\underset{\div 1}{\frac{4}{12} = \frac{4}{12}}}$$

Finding the common factors of both the numerator and denominator allows us to simplify each fraction to its simplest form.

The common factors of 4 and 12 are 1, 2 and 4.

The highest common factor is 4.

Generalisation:

Dividing both the numerator and the denominator of a fraction by their highest common factor converts the fraction to its simplest form.

$$\overset{\div 4}{\underset{\div 4}{\frac{20}{12} = \frac{5}{3}}}$$

Improper fraction can be simplified before or after they are converted to a mixed number.

The highest common factor of 20 and 12 is 4.

The highest common factor of 8 and 12 is 4.

$$\frac{20}{12} = \overset{\div 4}{\underset{\div 4}{1\frac{8}{12} = 1\frac{2}{3}}}$$

Fractions

Year 6

Express Fractions in Common Denomination

Vocabulary:

Fraction Notation Divided Equal Numerator Denominator Whole Parts Fraction Bar (Vinculum) Half Third Quarter Fifth Sixth Seventh Eighth Ninth Tenth One-_____ Multiple Common Denominator Convert Express Proportion

$\frac{1}{5}$ $\frac{4}{15}$

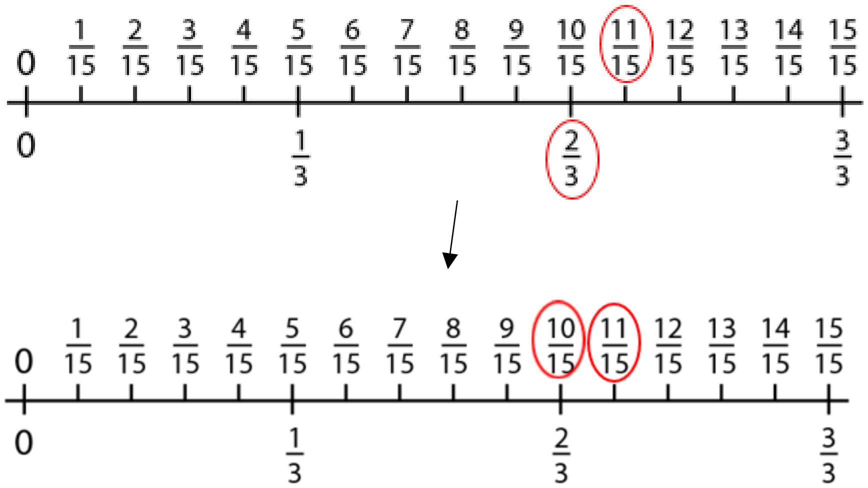
$$\frac{1}{5} \xrightarrow{\times 3} \frac{3}{15}$$

$\frac{3}{15}$ $\frac{4}{15}$

We can convert fraction into the same denomination in order to make them easier to compare in size. We can also represent this on a number line.

15 is a multiple of 5.

We can use 15 as the common denominator.



$\frac{1}{3}$ $\frac{3}{8}$

$$\frac{1}{3} \xrightarrow{\times 8} \frac{8}{24} \qquad \frac{3}{8} \xrightarrow{\times 3} \frac{9}{24}$$

$\frac{8}{24}$ $\frac{9}{24}$

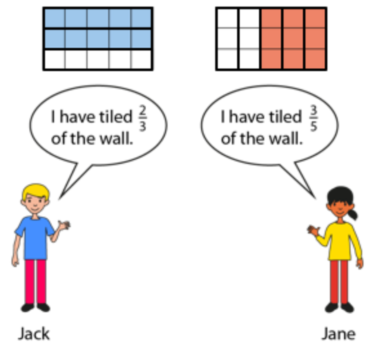
Where one denominator is not a multiple of another, we can multiply both denominators by different amounts in order to find a common denomination.

8 is not a multiple of 3.

24 is a multiple of both 3 and 8.

We can use 24 as the common denominator.

We need to express both fractions in twenty-fourths.



$$\frac{2}{3} \xrightarrow{\times 5} \frac{10}{15} \qquad \frac{3}{5} \xrightarrow{\times 3} \frac{9}{15}$$

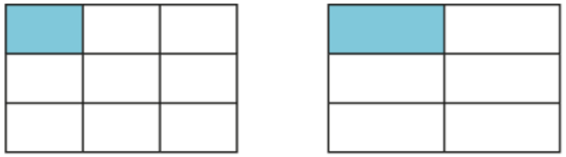
Fractions

Year 6

Compare Fractions with Different Denominators

Vocabulary:

Fraction Notation Divided Equal Numerator Denominator Whole Parts Fraction Bar (Vinculum) Half Third Quarter Fifth Sixth Seventh Eighth Ninth Tenth One-______ Multiple Common Denominator Convert Express Proportion Estimate Position Number Line Greater than Less than

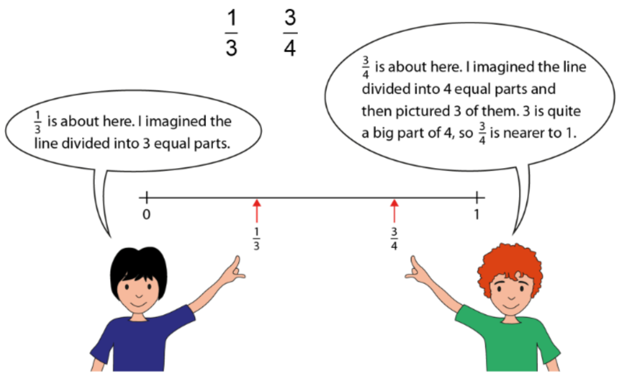


$$\frac{1}{9} < \frac{1}{6}$$

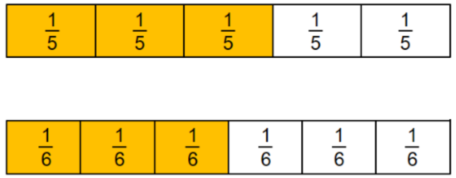
Generalisations:

If the numerators are both 1, then the larger the denominator, the smaller the fraction.

The denominator represents the number of equal parts the whole has been split into. The greater this number, the more equal parts and therefore the smaller the size of each part.



We can compare fractions and mixed numbers with the same numerator in different ways



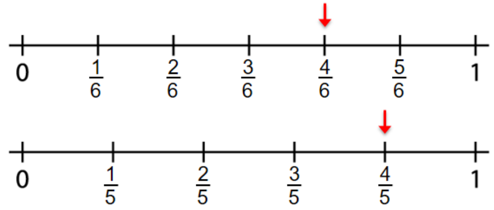
$$\frac{3}{5} > \frac{3}{6}$$

Verbal Reasoning

$\frac{2}{5}$ is 2 one-fifths $\frac{2}{6}$ is 2 one-sixths

I know that $\frac{1}{5} > \frac{1}{6}$, so $\frac{2}{5} > \frac{2}{6}$

We can use our knowledge of fractions on a number line to help estimate and compare their relative size.



$$\frac{4}{5} > \frac{4}{6}$$

Comparing their position in relation to the nearest landmark.

How close is it to 1 whole?

How close is it to 0?

How close is it from $\frac{1}{2}$?

We can reason about the proportional size of the numerator in relation to the denominator to compare fractions.

5 is a larger part of 6 than 7 is of 11, which means $\frac{5}{6}$ is greater than $\frac{7}{11}$

$$\frac{7}{11} < \frac{5}{6}$$