



YEAR 7
KNOWLEDGE ORGANISERS



BLOCK: FRACTIONAL THINKING

Addition & subtraction of fractions

"MATHS OPENS DOORS"

YEAR 7 — FRACTIONAL THINKING

Addition and subtraction of fractions

What do I need to be able to do?

- By the end of this unit you should be able to:
- Convert between mixed numbers and fractions
 - Add/Subtract unit fractions (same denominator)
 - Add/Subtract fractions (same denominator)
 - Add/Subtract fractions from integers
 - Use equivalent fractions
 - Add/Subtract any fractions
 - Add/Subtract improper fractions and mixed numbers
 - Use fractions in algebraic contexts

Keywords

- Denominator:** the bottom number in a fraction, which shows how many equal parts the item is divided into
- Equivalent:** having the same value
- Improper fraction:** a fraction where the numerator is greater than or equal to the denominator
- Mixed number:** a number written as a whole number and a fraction part
- Numerator:** the number above the line in a fraction, showing the number or parts of the whole
- Place value:** the value of a digit depending on its place in a number. In our decimal number system, each place is 10 times bigger than the place to its right
- Substitute:** to put numerical values in place of the letters in an expression

Representing Fractions

$\frac{1}{4}$ is represented in all the images

$1 \div 4$

Mixed numbers and fractions

$\frac{7}{5}$ Improper fraction

$1\frac{2}{5}$ Mixed number

In this model 5 parts make up a whole

Fractions can be bigger than a whole

Odd/Subtract unit fractions

Same denominator

$\frac{1}{12} + \frac{1}{12} - \frac{1}{12} = \frac{2}{12}$

$\frac{1}{4} + \frac{1}{4} = \frac{2}{4}$

With the same denominator ONLY the numerator is added or subtracted

Add/Subtract fractions

Same denominator

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

Sequences

$\frac{1}{3}, 1, 1\frac{2}{3}, 2\frac{1}{3}, 3, \dots$

Represent this on a number line to help

Odd/Subtract from integers

$1 - \frac{2}{6} = \frac{4}{6}$

$3 + \frac{1}{6} = 3\frac{1}{6}$

The denominator indicates the number of parts a whole is made up of

Equivalent fractions

Numerator and denominator have the same multiplier

$\frac{2}{3} = \frac{4}{6}$

$\frac{1}{3} = \frac{2}{6}$

Add/Subtraction fractions (common multiples)

Addition/Subtraction needs a common denominator

$\frac{3}{5} + \frac{7}{10} = \frac{6}{10} + \frac{7}{10} = \frac{13}{10}$

Add/Subtraction any fractions

$\frac{4}{5} - \frac{2}{3} = \frac{12}{15} - \frac{10}{15} = \frac{2}{15}$

Use equivalent fractions to find a common multiple for both denominators

Add/Subtraction fractions (improper and mixed)

$2\frac{1}{5} - 1\frac{3}{10} = 2\frac{2}{10} - 1\frac{3}{10} = \frac{22}{10} - \frac{13}{10} = \frac{9}{10}$

- Convert to an improper fraction
- Calculate with common denominator

Fractions in algebraic contexts

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

Apply inverse operations: $k = 2 + \frac{5}{8}$

Form expressions with fractions: $b + \frac{7}{9} \rightarrow b + \frac{7}{9}$

$p = 5 \quad m = 2$

Substitution: $\frac{p}{8} + \frac{1}{m} = \frac{5}{8} + \frac{1}{2}$

Partitioning method

$2\frac{1}{5} - 1\frac{3}{10} = 2\frac{2}{10} - 1\frac{3}{10} = 2\frac{2}{10} - 1 - \frac{3}{10} = 1\frac{2}{10} - \frac{3}{10} = \frac{9}{10}$

Fractions and decimals

Example: $\frac{6}{10} + 0.3 = 0.6 + 0.3$

$\frac{1}{10} = 0.1$

$\frac{1}{100} = 0.01$

Remember to use equivalent fractions and common denominators