

FRACTIONS KNOWLEDGE ORGANISER

Key Concepts

- 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
- 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

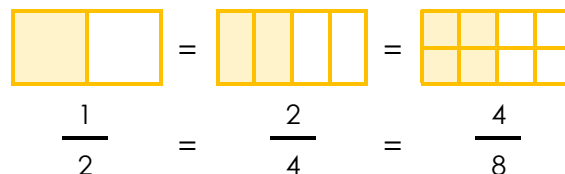
Key Vocabulary

- numerator
- denominator
- equivalent
- mixed number
- improper fraction

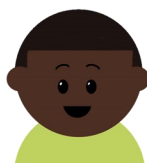


Equivalent Fractions

Equivalent fractions have different numerators and denominators but share the same value.



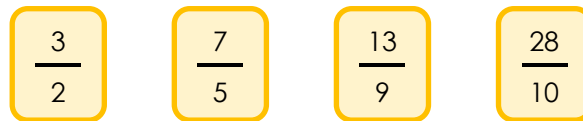
If you multiply or divide the numerator and denominator of a fraction by the same number, the new fraction will be equivalent.



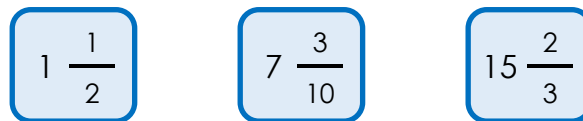
$$\frac{24}{26} \div 2 = \frac{12}{13}$$

Improper Fractions and Mixed Numbers

An **improper fraction** has a numerator which is greater than the denominator. For example:



A **mixed number** is made up of an integer and a proper fraction. For example:



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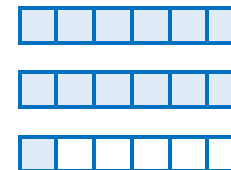
To **convert between improper fractions and mixed numbers**, we need to look at how many parts make up the whole.

The bar models show $\frac{13}{6}$.

There are 6 parts in the whole.

$$13 \div 6 = 2 \text{ remainder } 1$$

$$\frac{13}{6} = 2 \frac{1}{6}$$



The bar models show $3 \frac{2}{5}$.

There are 5 parts in the whole.

$$3 \times 5 = 15$$

$$\frac{15}{5} + \frac{2}{5} = \frac{17}{5}$$



Compare and Order Fractions

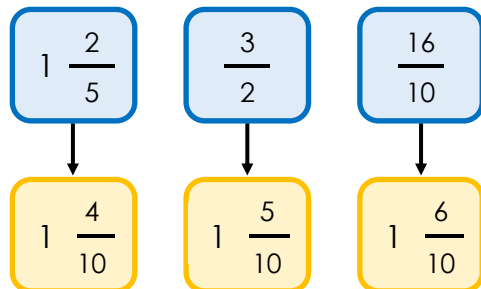
To **compare** and **order** fractions, we need to find a common denominator or numerator.



$$\frac{2}{3} = \frac{6}{9} \text{ so } \frac{2}{3} < \frac{7}{9}$$

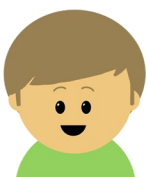
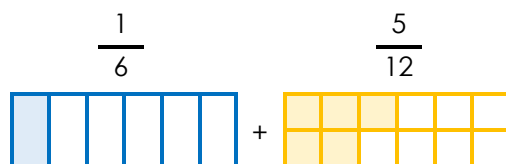
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These fractions have been ordered from smallest to greatest. Their equivalent fractions using common denominators are shown beneath.



Add Fractions

When we **add fractions** with **different denominators**, we need to find a common denominator.



$$\frac{1}{6} = \frac{2}{12}$$

$$\frac{2}{12} + \frac{5}{12} = \frac{7}{12}$$

Remember, when we have found the common denominator, we only need to add the numerators.

We can use this method to **add three fractions** b e y o n d 1 .

$$\frac{3}{7} + \frac{12}{21} + \frac{10}{14} = \frac{3}{7} + \frac{4}{7} + \frac{5}{7} = \frac{12}{7} = 1 \frac{5}{7}$$

To **add mixed numbers**, we add the wholes then the parts.

$$2 \frac{10}{15} + 4 \frac{2}{3}$$



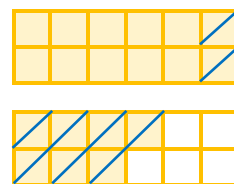
$$2 + 4 = 6$$

$$\frac{10}{15} + \frac{2}{3} = \frac{2}{3} + \frac{2}{3} = \frac{4}{3}$$

$$6 + \frac{4}{3} = 6 + 1 \frac{1}{3} = 7 \frac{1}{3}$$

Subtract Fractions

To **subtract fractions with different denominators**, we again find a common denominator. We can convert mixed numbers to improper fractions when we need to exchange.



$$1 \frac{7}{12} - \frac{3}{4} = 1 \frac{7}{12} - \frac{9}{12}$$

$$1 \frac{7}{12} - \frac{9}{12} = \frac{19}{12} - \frac{9}{12} = \frac{10}{12}$$

Converting mixed numbers to proper fractions also helps us when we **subtract mixed numbers** where exchanging is needed.

$$2 \frac{1}{5} - 1 \frac{7}{10} = 2 \frac{2}{10} - 1 \frac{7}{10} = \frac{22}{10} - \frac{17}{10} = \frac{5}{10}$$

Multiply Fractions by Integers

To **multiply a fraction by an integer**, we multiply the numerator by the integer.

$$\frac{3}{7} \times 2 = \frac{6}{7}$$

To **multiply a mixed number by an integer**, we can multiply the whole and part separately or convert to an improper fraction.

$$2 \frac{4}{9} \times 5$$

$$2 \times 5 = 10$$

$$\frac{4}{9} \times 5 = \frac{20}{9} = 2 \frac{2}{9}$$

$$10 + 2 \frac{2}{9} = 12 \frac{2}{9}$$

$$\frac{22}{9} \times 5 = \frac{110}{9} = 12 \frac{2}{9}$$

Fractions as Operators

We can **multiply fractions by integers** to find **fractions of amounts**.

$$\frac{2}{11} \text{ of } 4 = \frac{2}{11} \times 4 = \frac{8}{11}$$

