

Fractions

Presented by QSC

Fractions

Recall a fraction represents *parts* of a whole. It consists of a numerator and denominator like so:

$$\frac{\text{numerator}}{\text{denominator}}$$

Fractions can be reduced/simplified by canceling (or dividing by) common factors.

We can always turn a whole number into a fraction by putting it over 1, i.e. the number goes in the numerator and 1 is in the denominator. Example: $12 = \frac{12}{1}$

Improper vs Mixed Fractions

- An improper fraction is where the numerator is bigger than the denominator.
 - Examples: $\frac{11}{10}$, $\frac{18}{5}$, $\frac{101}{2}$, etc...
- A mixed fraction is a whole number and a fraction
 - Examples: $2\frac{1}{3}$, $10\frac{1}{2}$, $8\frac{3}{4}$, etc...
 - The mixed fractions $2\frac{1}{3} = 2 + \frac{1}{3}$, $10\frac{1}{2} = 10 + \frac{1}{2}$, $8\frac{3}{4} = 8 + \frac{3}{4}$, etc...
 - Observe that the addition symbol gets dropped when written as a mixed fraction
- We can re-write an improper fraction as a mixed fraction, and a mixed fraction as an improper fraction
 - Example (improper to mixed): $\frac{11}{10} = \frac{10}{10} + \frac{1}{10} = 1 + \frac{1}{10} = 1\frac{1}{10}$
 - Example (mixed to improper): $2\frac{1}{3} = 2 + \frac{1}{3} = \frac{6}{3} + \frac{1}{3} = \frac{7}{3}$
 - You will be able to re-write fractions like the above once we have learned how to add fractions.

Fractions with Pies

$$\frac{5}{8} - \frac{1}{4} =$$

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

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

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

Rules for Addition and Subtraction

1. Make sure the fractions have a common denominator. If they do not, multiply numerator and denominator of the fraction by the value which will give them a common denominator.
2. Add (or subtract) the values from the numerator, left to right, and leave the denominator as is.

Practice, Using Common Denominators

$$\frac{5}{6} + \frac{1}{3} =$$

$$\frac{5}{6} - \frac{2}{3} =$$

$$\frac{5}{6} + \frac{3}{8} =$$

Practice, Using Butterfly Method

$$\frac{5}{6} + \frac{1}{3} =$$

$$\frac{5}{6} - \frac{2}{3} =$$

$$\frac{5}{6} + \frac{3}{8} =$$

Rules for Multiplication and Division

- Multiplication of fractions: Multiplying straight across. Multiply values in the numerator together, over the values of the denominator multiplied together.
- Division of fractions: **keep** the first fraction, **change** the division into multiplication, and **flip** the second fraction into its reciprocal.

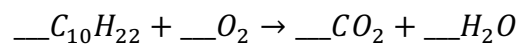
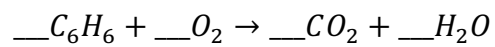
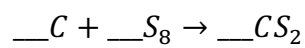
Practice

$$\frac{7}{10} * \frac{4}{5} =$$

$$\frac{\frac{7}{10}}{\frac{4}{5}} =$$

$$\frac{4}{5} \div \frac{7}{10} =$$

Scientific Applications (Chemistry Examples)



Workshop Survey:



QSC Workshops:



More Practice:



Small Fraction Circles in Color With Labels

Use these fractions circles cut out, on this page, or a combination of both.

