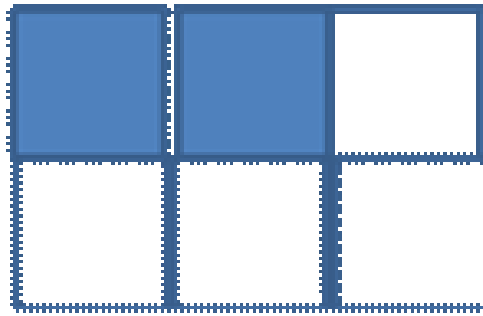


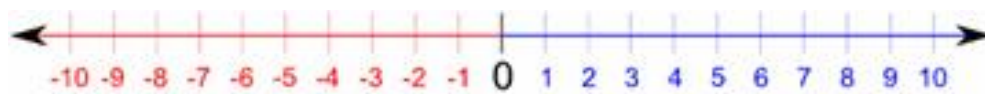
Types of Fractions



A **fraction** is a part of a **whole**. A whole can be a group of objects or a single object. For example, $\frac{3}{15}$ is a fraction. In this, 3 is called the numerator and 15 is called the denominator.

In the figure shown here, the shaded portion is represented by $\frac{2}{6}$.

Whole numbers are represented on the number line as shown here:

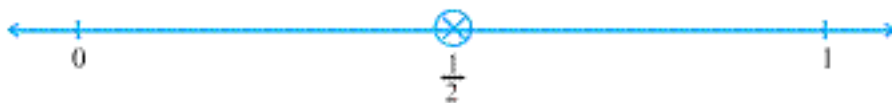


A fraction can be represented on the number line.

For example,

- Consider a fraction $\frac{1}{2}$. $\frac{1}{2}$ is greater than 0, but less than 1.

Divide the space between 0 and 1 into two equal parts. We can show one part as the fraction $\frac{1}{2}$.



- Consider another fraction $\frac{1}{5}$. $\frac{1}{5}$ is greater than 0, but less than 1.

Divide the space between 0 and 1 into five equal parts. We can show the first part as $\frac{1}{5}$, the second as $\frac{2}{5}$, the third as $\frac{3}{5}$, the fourth as $\frac{4}{5}$ and the fifth part as $\frac{5}{5} = 1$.



Proper fractions:

A **proper fraction** is a number representing **a part of a whole**.

In a proper fraction, the number in the denominator shows the number of parts into which the whole is divided, while the number in the numerator shows the number of parts that have been taken.

Eg: $\frac{4}{20}, \frac{3}{20}, \frac{10}{20}$

Improper fractions:

A fraction in which the **numerator is bigger than the denominator** is called an improper fraction. Eg: $\frac{4}{3}, \frac{13}{8}, \frac{19}{7}$

Mixed fractions:

A combination of **a whole and a part** is said to be a mixed fraction.

Eg: $3\frac{1}{2}, 4\frac{1}{5}$

Conversion of improper fraction into mixed fraction:

An improper fraction can be expressed as mixed fraction by dividing the numerator by the denominator of the improper fraction to obtain the quotient and the remainder. Then the mixed fraction will be $\text{Quotient} \frac{\text{Remainder}}{\text{Divisor}}$.

Conversion of mixed fraction into improper fraction:

A mixed fraction can be written in the form an improper fraction by writing it in the following way:

$$\frac{(\text{Whole} \times \text{Denominator}) + \text{Numerator}}{\text{Denominator}}$$

Like fractions:

Fractions with the **same denominator** are said to be **like fractions**.

Eg: $\frac{4}{15}, \frac{6}{15}, \frac{8}{15}$

Unlike fractions:

Fractions with **different denominators** are called **unlike fractions**.

Eg: $\frac{3}{15}, \frac{3}{20}, \frac{9}{28}$

Equivalent fractions:

Fractions that represent the **same part of a whole** are said to be equivalent fractions.

Eg: $\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8} = \frac{5}{10} \dots$

To find an equivalent fraction of a given fraction, multiply both the numerator and the denominator of the given fraction by the same number.

Simplest form of fraction:

A fraction is said to be in its **simplest form** or its **lowest form** if its **numerator and denominator have no common factor except one**. The simplest form of a given fraction can also be found by dividing its numerator and denominator by its highest common factor (HCF).

Comparing Fractions

Fractions with the same denominator are called **like fractions**.

Comparing like fractions:

In like fractions, the fraction with the **greater numerator** is greater. Eg: In fractions $\frac{5}{7}$ and $\frac{3}{7}$,

$$\frac{5}{7} \text{ is greater than } \frac{3}{7} \text{ as } 5 \text{ is greater than } 3.$$

Two fractions are **unlike fractions** if they have **different denominators**.

Comparing unlike fractions:

If two fractions with the **same numerator but different denominators** are to be compared, then the fraction with the smaller denominator is the greater of the two.

To compare unlike fractions, we first convert them into equivalent fractions. For example, to compare the

following fractions ie.,

$$\frac{6}{8} \text{ and } \frac{4}{6}$$

We find the common multiple of the denominators 6 and 8. 48 is a common multiple of 6 and 8.

24 is also a common multiple of 6 and 8. **Least Common Multiple** (LCM) of 6 and 8 = 24

$$\begin{aligned} \frac{6}{8} \times \frac{3}{4} &= \frac{18}{32} \\ \frac{4}{6} \times \frac{4}{4} &= \frac{16}{24} \\ \frac{6}{8} \times \frac{4}{4} &= \frac{24}{32} \\ \frac{4}{6} \times \frac{6}{6} &= \frac{24}{36} \end{aligned}$$

$$\frac{18}{24} > \frac{16}{24} \Rightarrow \frac{6}{8} > \frac{4}{6}$$

Hence, we can say that $\frac{6}{8}$ is greater than $\frac{4}{6}$