Unit 9: Fractions

Friendly Notes

Fraction of a Whole

1 whole = 2 halves = \( \frac{2}{2} \)
1 whole = 3 thirds = \( \frac{3}{3} \)
1 whole = 4 fourths = \( \frac{4}{4} \)
1 whole = 5 fifths = \( \frac{5}{5} \)

1 out of 6 equal parts is shaded.
\( \frac{1}{6} \) of the circle is shaded.
\( \frac{1}{6} \) = one-sixth

1 whole = 6 sixths
\[ = \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} \]
\( \frac{1}{6} \) and \( \frac{5}{6} \) make one whole.
For fractions with a common denominator, the fraction with the greatest numerator is the greatest.

Arrange the fractions in order. Begin with the smallest.

We compare the size of the shaded parts.

\[
\begin{align*}
\frac{1}{7} & \\
\frac{3}{7} & \\
\frac{5}{7} & \\
\end{align*}
\]

\[
\begin{align*}
\frac{5}{7} & \text{ is the greatest.} \\
\frac{1}{7} & \text{ is the smallest.} \\
\end{align*}
\]

Arranging the fractions in order beginning with the smallest, we have \( \frac{1}{7}, \frac{3}{7}, \frac{5}{7} \).
For fractions with a common numerator, the fraction with the greatest denominator is the smallest.

Arrange the fractions in order. Begin with the smallest.

\[
\begin{array}{c}
\frac{1}{3} \\
\frac{1}{4} \\
\frac{1}{9} \\
\end{array}
\]

\(\frac{1}{3}\) is the greatest.

\(\frac{1}{9}\) is the smallest.

Arranging the fractions in order beginning with the smallest, we have \(\frac{1}{9}, \frac{1}{4}, \frac{1}{3}\).

We can represent fractions on number lines

What fraction does each letter represent?

The number line has 5 equal parts. Each part represents \(\frac{1}{5}\).

\[X = \frac{1}{5}, \ Y = \frac{3}{5}, \ Z = \frac{4}{5}\]
Equivalent Fractions

From the bars above, we can see that the following fractions are equal.

\[ \frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8} = \frac{5}{10} = \frac{6}{12} \]

Equivalent fractions have different numerators and denominators. But they are equal in value.

\[ \frac{1}{2}, \frac{2}{4}, \frac{3}{6}, \frac{4}{8}, \frac{5}{10}, \frac{6}{12} \] are equivalent fractions.
To find an equivalent fraction, we can either multiply or divide the numerator and denominator by the same number.

Find an equivalent fraction of $\frac{1}{3}$ and $\frac{6}{10}$.

- $\frac{1}{3} \times 3 = \frac{3}{9}$
- $\frac{6}{10} \div 2 = \frac{3}{5}$

We can express a fraction in its simplest form.

Express $\frac{8}{12}$ in its simplest form.

$\frac{8}{12} = \frac{4}{6} = \frac{2}{3}$

$\frac{2}{3}$ is the simplest form of $\frac{8}{12}$. 
We can compare related fractions by expressing them in same denominator.

Which is greater, $\frac{2}{3}$ or $\frac{5}{6}$?

$\frac{5}{6}$ is greater than $\frac{2}{3}$.

Which is smaller, $\frac{3}{5}$ or $\frac{5}{10}$?

$\frac{5}{10}$ is smaller than $\frac{3}{5}$. 

\[ \frac{2}{3} = \frac{4}{6} \]

\[ \frac{3}{5} = \frac{6}{10} \]
Fractions and Measurement

We can represent different measurement using fractions.

1. A rod is $\frac{1}{2}$ m long.
   How long are 5 such rods placed end to end?
   \[ \frac{1}{2} \text{ m} \quad 1 \text{ m} \quad 1\frac{1}{2} \text{ m} \quad 2 \text{ m} \quad 2\frac{1}{2} \text{ m} \quad 3 \text{ m} \]
   They are $2 \frac{1}{2}$ m long.

2. Each block has a mass of $\frac{1}{2}$ kg.
   What is the mass of the package?
   \[ \frac{1}{2} \text{ kg} \quad \frac{1}{2} \text{ kg} \quad \frac{1}{2} \text{ kg} \quad \frac{1}{2} \text{ kg} \quad \frac{1}{2} \text{ kg} \quad \frac{1}{2} \text{ kg} \quad \frac{1}{2} \text{ kg} \quad \frac{1}{2} \text{ kg} \]
   The mass of the package is $4 \frac{1}{2}$ kg.

3. How many halves are there in 3 in.?
   \[ \frac{1}{2} \text{ in.} \quad \frac{1}{2} \text{ in.} \quad \frac{1}{2} \text{ in.} \quad \frac{1}{2} \text{ in.} \quad \frac{1}{2} \text{ in.} \]
   \[ \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} = 3 \]
   There are 6 halves in 3 in.
Fraction of a Set

3 out of 12 fruits are pears.

\( \frac{3}{12} \) of the fruits are pears.

3 out of 12 fruits are mangoes.

\( \frac{3}{12} \) of the fruits are mangoes.

6 out of 12 fruits are apples.

\( \frac{6}{12} = \frac{1}{2} \) of the fruits are apples.
1. There are 10 balloons.  
3 of these balloons are red.  
4 of these balloons are green.  
The remaining balloons are white.  
What fraction of the balloons are white?

\[ 10 - 3 - 4 = 3 \]

\[ \frac{3}{10} \] of the balloons are white.
2. Leila has 3 quarters, 5 dimes, 2 nickels, and 2 pennies.

(a) What fraction of her coins are quarters?
(b) What fraction of her coins are nickels?
(c) What fraction of her coins are dimes?

There are 12 coins altogether.

(a) \[ \frac{3}{12} = \frac{1}{4} \]

\[ \frac{1}{4} \] of her coins are quarters.

(b) \[ \frac{2}{12} = \frac{1}{6} \]

\[ \frac{1}{6} \] of her coins are nickels.

(c) 5 out of 12 coins are dimes.

\[ \frac{5}{12} \] of her coins are dimes.