Unit 3 : Fractions

Friendly Notes

Looking Back

To compare fractions, we change them to **like fractions**. Like fractions are fractions with a common denominator. For like fractions, the greater the numerator, the greater the fraction.

Which is greater, $\frac{4}{5}$ or $\frac{5}{6}$?

$$\frac{4}{5} \xlongequal{\times 6} \frac{24}{30}$$

To change the fractions to like fractions, we find equivalent fractions which have the same denominator.

$$\frac{5}{6} \xlongequal{\times 5} \frac{25}{30}$$

To change to like fractions, we find the common multiple of the denominators.
30 is a common multiple of 5 and 6.

$\frac{25}{30}$ is greater than $\frac{24}{30}$.

So, $\frac{5}{6}$ is greater than $\frac{4}{5}$.

Fractions and Division

Find the value of $34 \div 8$.

Method 1:

$$34 \div 8 = 4\frac{2}{8}$$
$$= 4\frac{1}{4}$$

$$\begin{array}{r} 4 \\ 8\overline{)\,3\;4} \\ \underline{3\;2} \\ 2 \end{array}$$

Method 2:

$$34 \div 8 = \frac{34}{8}$$
$$= \frac{17}{4}$$
$$= \frac{16}{4} + \frac{1}{4}$$
$$= 4\frac{1}{4}$$

Reduce $\frac{34}{8}$ to its simplest form.

Addition and Subtraction of Unlike Fractions

Unlike fractions are fractions which do not have the same denominator. When adding or subtracting unlike fractions, we change them to like fractions first.
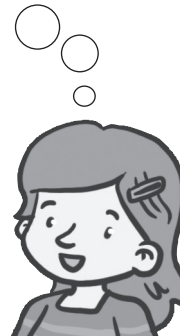
1. Add $\frac{2}{3}$ and $\frac{3}{10}$.

$$\frac{2}{3} + \frac{3}{10} = \frac{20}{30} + \frac{9}{30}$$
$$= \frac{29}{30}$$

$\frac{2}{3}, \frac{4}{6}, \frac{6}{9}, \frac{8}{12}, ..., \frac{20}{30}$

$\frac{3}{10}, \frac{6}{20}, \frac{9}{30}, ...$

30 is a common multiple of 3 and 10.

2. Subtract $\frac{2}{3}$ from $\frac{4}{5}$.

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

$\frac{4}{5}, \frac{8}{10}, \frac{12}{15}, ...$
$\frac{2}{3}, \frac{4}{6}, \frac{6}{9}, \frac{8}{12}, \frac{10}{15}, ...$
15 is a common multiple of 5 and 3.

Addition and Subtraction of Mixed Numbers

When adding or subtracting mixed numbers, we add or subtract the whole numbers first and then the fractions.

1. Add $3\frac{1}{4}$ and $2\frac{3}{8}$.

$$3\frac{1}{4} + 2\frac{3}{8} = 5\frac{1}{4} + \frac{3}{8}$$
$$= 5\frac{2}{8} + \frac{3}{8}$$
$$= 5\frac{5}{8}$$

$3\frac{1}{4} \xrightarrow{+ 2} 5\frac{1}{4} \xrightarrow{+ \frac{3}{8}} 5\frac{5}{8}$

Primary Mathematics (Common Core Edition) Extra Practice 5

2. Subtract $1\frac{5}{6}$ from $4\frac{3}{4}$.

$$4\frac{3}{4} - 1\frac{5}{6} = 3\frac{3}{4} - \frac{5}{6}$$
$$= 3\frac{9}{12} - \frac{10}{12}$$
$$= 2\frac{21}{12} - \frac{10}{12}$$
$$= 2\frac{11}{12}$$

$$3\frac{9}{12} = 2 + 1 + \frac{9}{12}$$
$$= 2 + \frac{12}{12} + \frac{9}{12}$$
$$= 2\frac{21}{12}$$

$$4\frac{3}{4} \xrightarrow{\ -1\ } 3\frac{3}{4} \xrightarrow{\ -\frac{5}{6}\ } 2\frac{11}{12}$$

Product of a Fraction and a Whole Number

When multiplying a fraction by a whole number, we multiply the whole number by the numerator of the fraction.

1. Multiply 9 by $\frac{3}{10}$.

$$9 \times \frac{3}{10} = \frac{27}{10}$$
$$= 2\frac{7}{10}$$

$$9 \times \frac{3}{10} = \frac{3 \times 9}{10}$$
$$9 \times \frac{3}{10} = \frac{9 \times 3}{10}$$

2. Find $\frac{3}{5}$ of a liter in milliliters.

$$\frac{3}{5} \text{ of a liter} = \frac{3}{5} \times 1 \text{ L}$$
$$= \frac{3}{5} \times 1{,}000 \text{ ml}$$
$$= \frac{3 \times 1{,}000}{5}$$
$$= \frac{3{,}000}{5}$$
$$= 600 \text{ ml}$$

1 L = 1,000 ml

3. Find $\frac{3}{4}$ of a meter in centimeters.

$$\frac{3}{4} \text{ of a meter} = \frac{3}{4} \times 1 \text{ m}$$
$$= \frac{3}{4} \times 100 \text{ cm}$$
$$= \frac{3 \times 100}{4}$$
$$= \frac{300}{4}$$
$$= 75 \text{ cm}$$

1 m = 100 cm

Word Problems

There are 42 children in a class. $\frac{1}{6}$ of them wear glasses.

How many children do not wear glasses?

Method 1:

$1 - \frac{1}{6} = \frac{5}{6}$

> First, I find what fraction of the children do not wear glasses.

$\frac{5}{6}$ of the children do not wear glasses.

$$\frac{5}{6} \times 42 = \frac{5 \times \cancel{42}^{7}}{\cancel{6}_{1}}$$

$$= 35$$

35 children do not wear glasses.

Method 2:

$$\text{Number of children who wear glasses} = \frac{1 \times \cancel{42}^{7}}{\cancel{6}_{1}}$$

$$= 7$$

$$\text{Number of children who do not wear glasses} = 42 - 7$$
$$= 35$$

Method 3:

6 units = 42 children
1 unit = 7 children

$$\text{Number of children who do not wear glasses} = 5 \text{ units}$$
$$= 5 \times 7$$
$$= 35$$