Chapter- 11

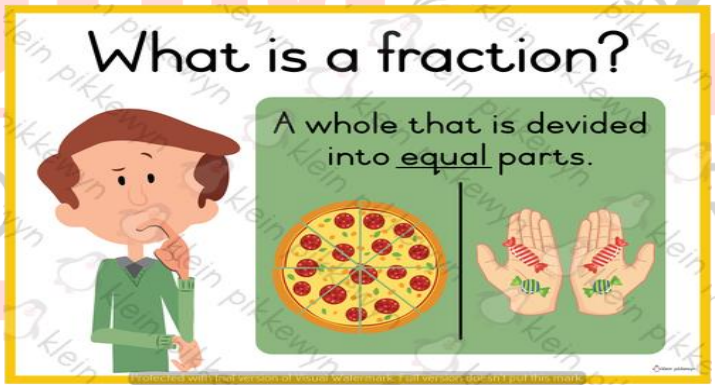
Fractions

STUDY NOTES

LEARN ABOUT:

- **INTRODUCTION OF FRACTIONS**
- **WRITING FRACTIONS IN WORDS**
- **TYPES OF FRACTIONS**
- **EQUIVALENT FRACTIONS AND FINDING EQUIVALENT FRACTIONS**
- **ADDITION OF LIKE FRACTIONS**
- **SUBTRACTION OF LIKE FRACTIONS**

❖ INTRODUCTION OF FRACTIONS-



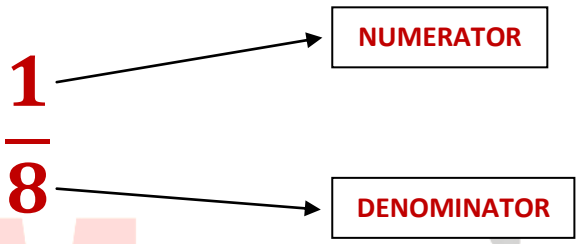
A fraction represents a part of a whole or, more generally, any number of equal parts.

The above pizza is divided into in to 8 equal parts, then each part is known as one-eighth of the whole pizza and is represented as $\frac{1}{8}$.

Here, $\frac{1}{8}$ is known as a **fraction** and it is read as one by eight.

A fraction has two parts.

1. **Denominator**
2. **Numerator**

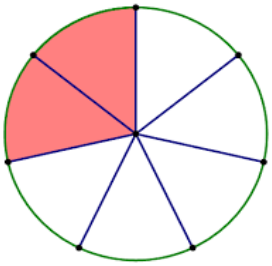


The number of equal parts one whole has been divided into, is called the **denominator** of the fraction. The number of parts of the whole that are under consideration, is called the **numerator** of the fraction.

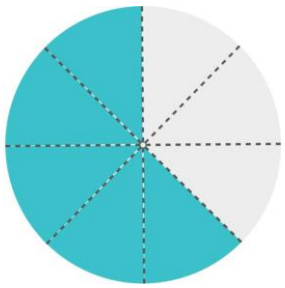
(Note: Numerator is written above the line while the denominator is written below the line.)

EXAMPLE-1

Write the fraction for the shaded part of the figures given below.



$= \frac{2}{7}$



$= \frac{5}{8}$

❖ WRITING FRACTIONS IN WORDS-

The numerator of a fraction is simply written in words while the denominator is written in the ordinal, plural form except in cases where the denominator is 2. The numerator and the denominator are separated by a hyphen.

EXAMPLE- 2

$\frac{7}{8}$ - Seven- eighths

EXAMPLE-3

$\frac{1}{2}$ – One- half

(Note: 1. For fractions having 2 as their denominators, the word half is used after the hyphen.
2. For fractions with denominators 4, 'quarters' can also be used after the hyphen.)

❖ TYPES OF FRACTIONS-

1. UNIT FRACTIONS-

Unit fractions are those fractions whose numerator is always 1.

EXAMPLE-4

Consider fractions $\frac{1}{2}, \frac{1}{3}, \frac{1}{7}$, etc. They are all unit fractions.

2. LIKE FRACTIONS-

Like fractions are those fractions which have the same denominator.

EXAMPLE-5

$\frac{7}{13}, \frac{6}{13}, \frac{8}{13}$, etc. are all like fractions as they have the same denominator 13.

3. UNLIKE FRACTIONS-

Unlike fractions are those fractions which have different denominators.

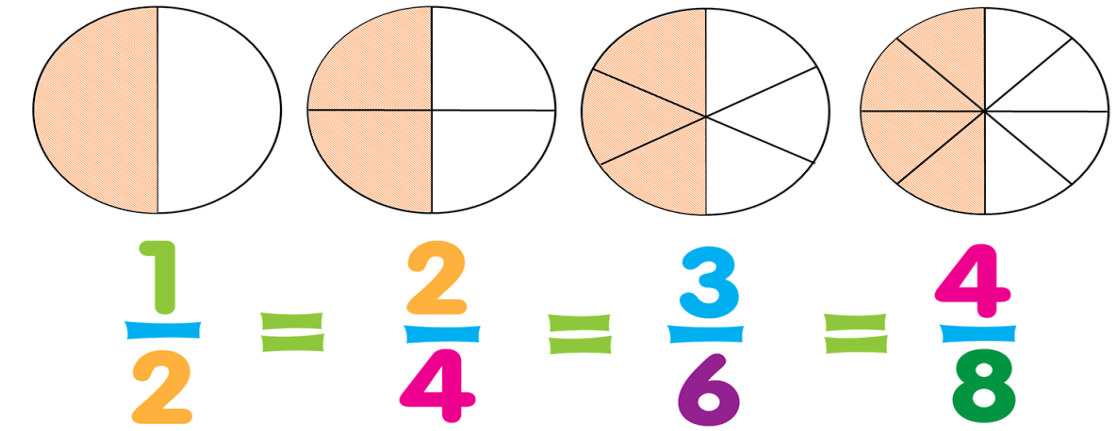
EXAMPLE-6

$\frac{7}{8}, \frac{1}{2}, \frac{4}{5}$, etc. are all unlike fractions as they have different denominators.

❖ EQUIVALENT FRACTIONS AND FINDING EQUIVALENT FRACTIONS-

Equivalent fractions are those fractions which can be simplified to the same fraction i.e fractions that represent the same part of the whole.

We can simplify a fraction by dividing both the numerator and the denominator of the fraction by the same number.



EXAMPLE-7

Consider the fraction $\frac{8}{24}$. Here, the denominator i.e. 24 is divisible by the numerator 8.

$$\frac{8}{24} = \frac{8 \div 8}{24 \div 8} = \frac{1}{3}$$

Here, $\frac{1}{3}$ is the simplified form of $\frac{8}{24}$.

Now, consider two fractions $\frac{6}{20}$ and $\frac{15}{50}$.

Simplify both the fractions

$$\frac{6}{20} = \frac{6 \div 2}{20 \div 2} = \frac{3}{10}; \quad \frac{15}{50} = \frac{15 \div 5}{50 \div 5} = \frac{3}{10}$$

Since both of this fraction can be simplified by 3 by 10, they are equivalent.

Another quick method to check whether two or more fractions are equivalent is to multiply the numerator of the first fraction by the denominator of the second fraction and to multiply the denominator of the first fraction by the numerator of the second fraction. If both the products are the same, then the fractions are equivalent.

Consider $\frac{6}{20}$ and $\frac{15}{50}$ again.

$$\frac{6}{20} \times \frac{15}{50}$$

6 x 50 = 300 and 20 x 15 = 300

Since, the answer is 300 in both the cases, $\frac{6}{20}$ and $\frac{15}{50}$ are equivalent fractions.

FINDING EQUIVALENT FRACTIONS-

To find equivalent fractions of a given fraction, we multiply or divide the numerator and the denominator of the fraction by the same number other than zero or one.

EXAMPLE-8

Find equivalent fractions of $\frac{2}{13}$.

Solution:

Equivalent fractions of $\frac{2}{13}$ are:

$$\frac{2\times2}{13\times2} = \frac{4}{26}; \frac{2\times3}{13\times3} = \frac{6}{39}; \frac{2\times4}{13\times4} = \frac{8}{52} = \frac{2\times5}{13\times5} = \frac{10}{65}; \text{etc.}$$

For more equivalent fractions of $\frac{2}{13}$, we can further multiply the numerator and denominator by 6, 7, 8, 9, 10…… etc.

EXAMPLE-9

Find two equivalent fractions of $\frac{16}{20}$.

Solution:

Equivalent fractions of $\frac{16}{20}$ will be

$$\frac{16\div2}{20\div2} = \frac{8}{10}; \frac{16\div4}{20\div4} = \frac{4}{5}; \text{etc.}$$

$\therefore$ $\frac{16}{20}$, $\frac{8}{10}$ and $\frac{4}{5}$ are equivalent fractions.

❖ ADDITION OF LIKE FRACTIONS-

$$\frac{3}{7} + \frac{2}{7} = \frac{5}{7}$$

(Note: Like fractions can be added by simply adding the numerator of the given fractions and keeping the denominator same.)

EXAMPLE-9

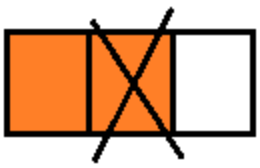
Add $\frac{1}{5}$ and $\frac{3}{5}$.

Solution

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

❖ SUBTRACTION OF LIKE FRACTIONS-

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



(Note: Like fractions can be subtracted by simply subtracting the smaller numerator from the greater numerator, while keeping the denominator same.)

EXAMPLE-10

Subtract $\frac{2}{6}$ from $\frac{4}{6}$.

Solution

$$\frac{4}{6} - \frac{2}{6} = \frac{4-2}{6} = \frac{2}{6}$$

----------X—X—X----------