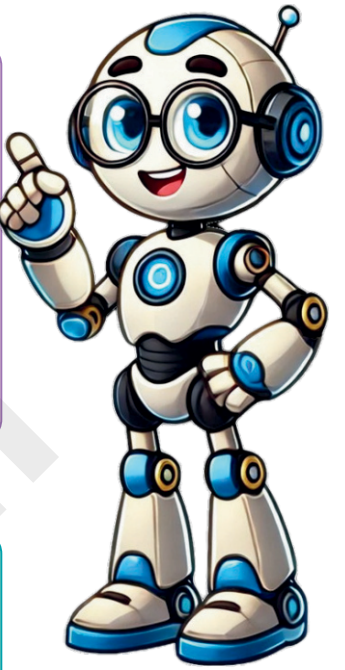
7 Fractions

We'll cover the following key points:

→Fractional Numbers
→Numerator and Denominator
→One-Fifth, One-Sixth ....., One-Tenth
→Unit Fractions
→Like and Unlike Fractions
→Equivalent Fractions



Hi, I'm EeeBee

Do you Remember fundamental concept in previous class.
In class 2nd we learnt

→Two Equal Parts of Whole
→Four Equal Parts of Whole

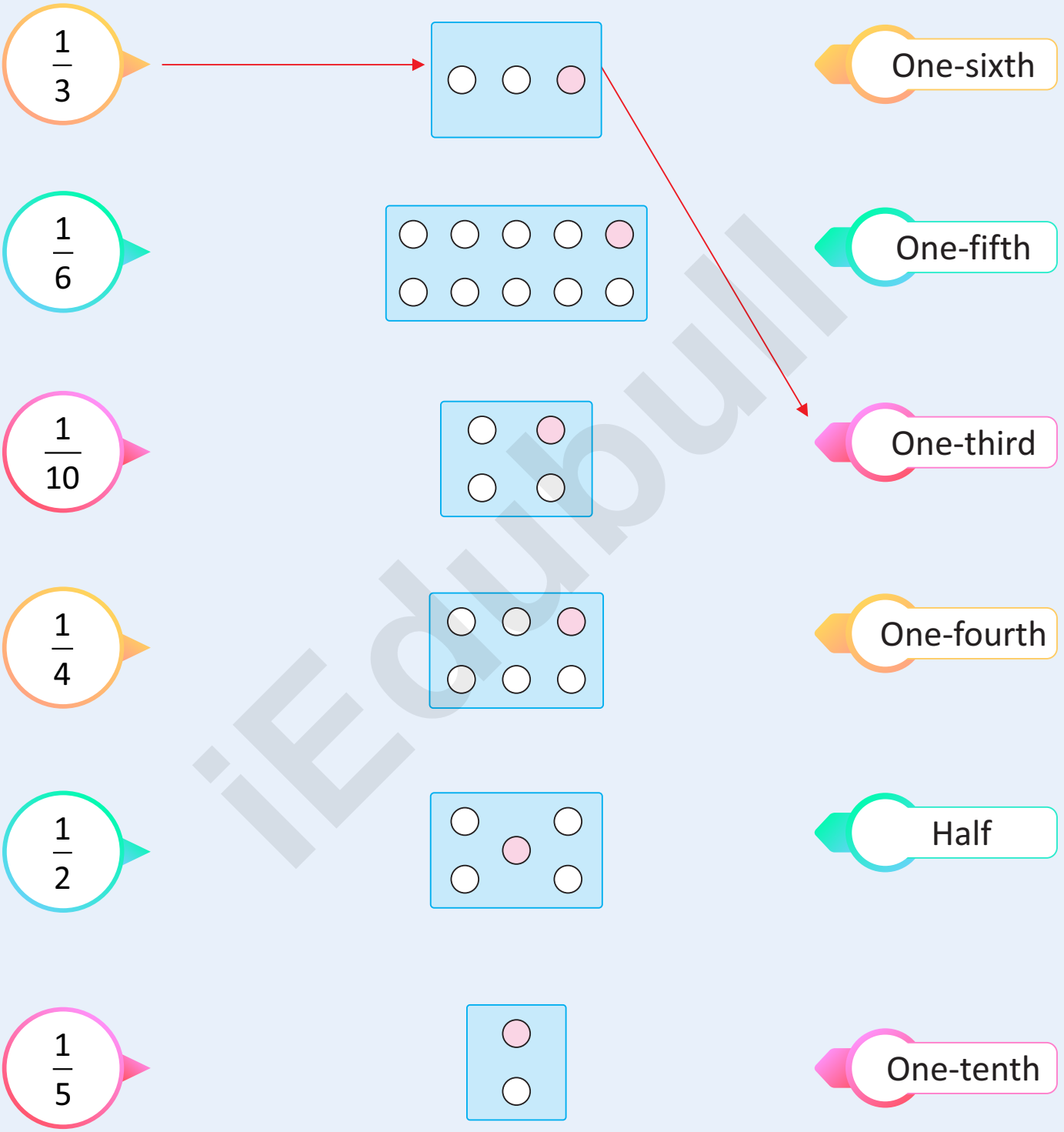
Still curious? Talk to me by scanning the QR code.

Learning Outcomes

By the end of this chapter, students will be able to:

- Understand the concept of fractions as a part of a whole.
- Identify and represent fractions using visual aids like shapes and objects.
- Recognize and write fractions in numerical form (e.g., $\frac{1}{2}, \frac{1}{4}, \frac{3}{4}$).
- Compare and order simple fractions with the same denominator.
- Understand the terms numerator and denominator.
- Identify equivalent fractions using pictures and simple examples.
- Add and subtract fractions with the same denominator.
- Solve simple real-life problems involving fractions (e.g., sharing items equally).
- Represent fractions on a number line.
- Develop an appreciation for the use of fractions in everyday life situations.

Match the following. One has been done for you:



Fractional Numbers

Take a Task

Watch Remedial

A fraction shows a part of a whole.

Let us revise what we have learnt about fractional numbers in Class II.

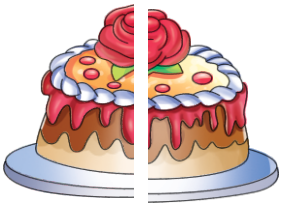
A complete or full object is a **whole**.

Suraj has a whole cake.

He divides it into 2 equal parts.

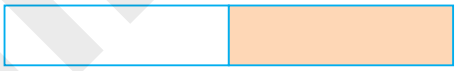
Each equal part is called a **fraction**.

Whole



Parts

A fraction of an object is always smaller than the whole object.

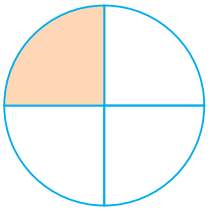


The figure given at right (we may call it a rectangle) is divided into 2 equal parts, and 1 part out of 2 parts has been shaded. We can say that $\frac{1}{2}$ of the rectangle has been shaded.

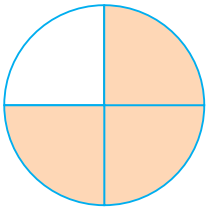
$\frac{1}{2}$ is read as 'one by two' or 'one over two' or 'one half'.

bar ← $\frac{1}{2}$ ← 1 ← Number of shaded part
2 ← Total number of parts

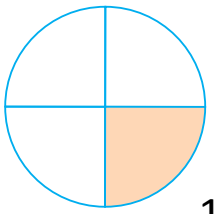
In the adjoining fig, the shaded part is $\frac{1}{4}$ of the whole circle.



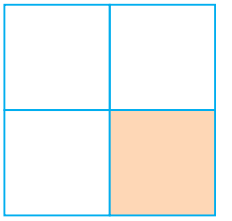
In the adjoining fig, the shaded part is $\frac{3}{4}$ of the whole circle.



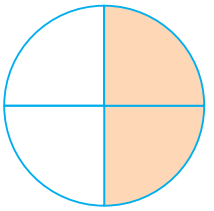
Thus, $\frac{1}{2}, \frac{1}{4}, \frac{3}{4}$ etc, are called fractional numbers or common fractions or fractions.



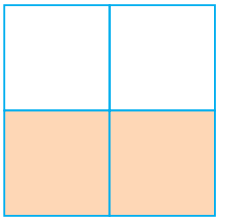
One-fourth ($\frac{1}{4}$)



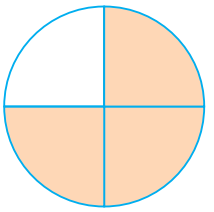
One-fourth ($\frac{1}{4}$)



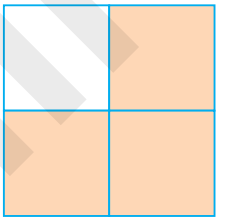
Two-fourths ($\frac{2}{4}$)



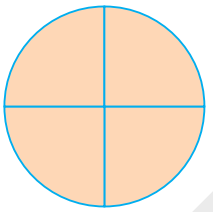
Two-fourths ($\frac{2}{4}$)



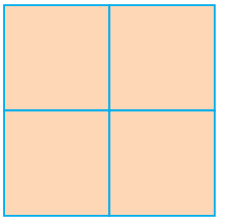
Three-fourths ($\frac{3}{4}$)



Three-fourths ($\frac{3}{4}$)



Four-fourths (whole)



Four-fourths (whole)

Numerator and Denominator

Every fraction has two numerals. These numerals are separated by small line called **bar**. The numeral above the bar is called the **numerator** and numeral below the bar is called the **denominator**.

In fraction $\frac{2}{3}$, numerator is 2 and denominator is 3.

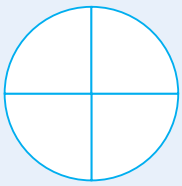
Similarly in $\frac{1}{5}$, 1 is the numerator and 5 is the denominator.

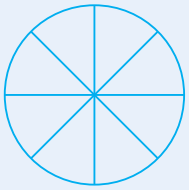
Fraction = $\frac{1}{5}$ → Numerator
→ Denominator

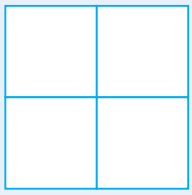
Exercise 7.1

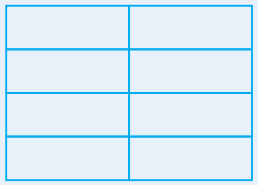
Knowledge Application

1. Shade $\frac{1}{4}$ (one-fourth) part of each shape:

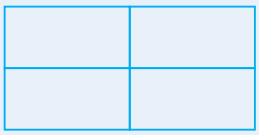
(a) 

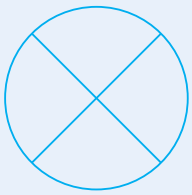
(b) 

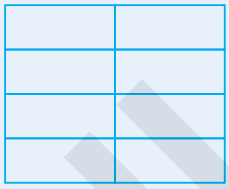
(c) 

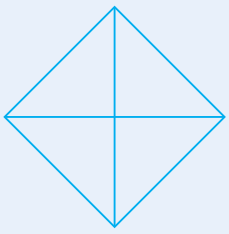
(d) 

2. Shade $\frac{3}{4}$ (three-fourth) part of each shape:

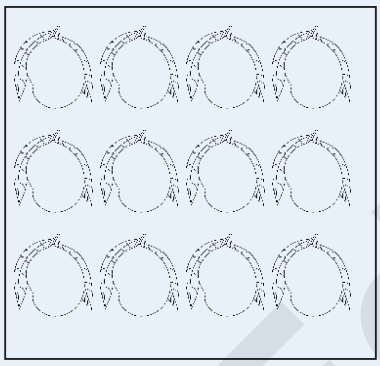
(a) 

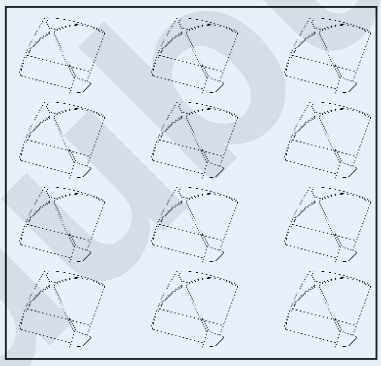
(b) 

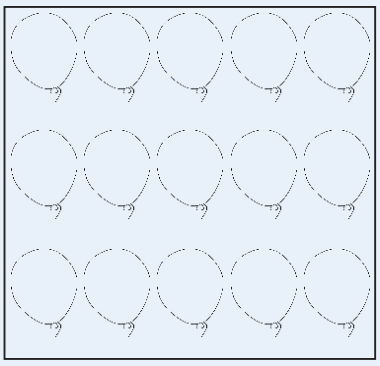
(c) 

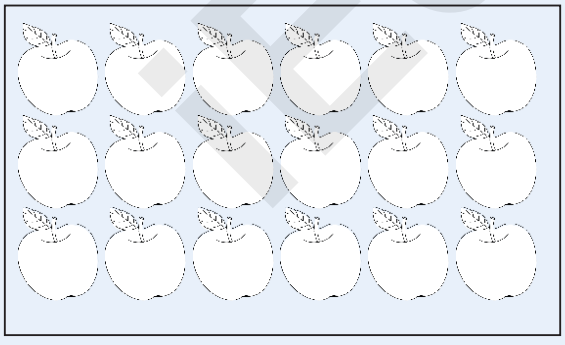
(d) 

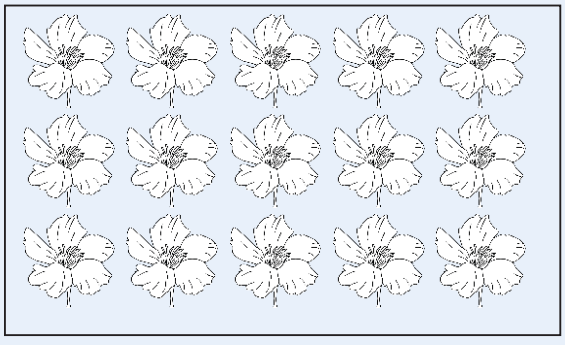
3. Colour each of the following collections to form $\frac{1}{3}$:

(a) 

(b) 

(c) 

(d) 

(e) 

4. Write the numerator (N) and denominator (D) of each fraction:

(a) $\frac{3}{11}$ (b) $\frac{8}{17}$ (c) $\frac{7}{11}$ (d) $\frac{5}{9}$ (e) $\frac{3}{13}$

(f) $\frac{6}{13}$ (g) $\frac{9}{19}$ (h) $\frac{11}{12}$ (i) $\frac{5}{19}$ (j) $\frac{6}{11}$

5. Write the following fractional numbers in figures:

(a) one by five

(b) seven over thirteen

(c) thirteen over seventeen

(d) eight over eighteen

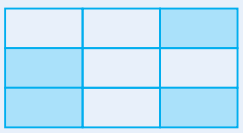
(e) seven over fifteen

(f) nineteen over fifty

(g) sixteen over thirty-one

(h) three over seven

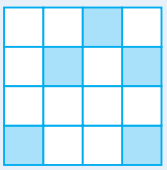
6. Choose and circle the correct answer for each shaped region:

(a) 

$\frac{2}{9}, \frac{1}{9}, \frac{5}{9}, \frac{4}{9}$

(b) 

$\frac{3}{8}, \frac{1}{8}, \frac{5}{8}, \frac{7}{8}$

(c) 

$\frac{7}{16}, \frac{9}{16}, \frac{5}{16}, \frac{15}{16}$

One-Fifth, One-Sixth ....., One-Tenth

Look at the following figure:

The figure is divided into 5 equal parts. 1 part is shaded or $\frac{1}{5}$ **(one-fifth)** part is shaded.

$\text{one-fifth} = \frac{1}{5}$

Now, the figure given alongside is divided into 6 equal parts and 1 part is shaded or **one-sixth** $\frac{1}{6}$ part of the figure is shaded.

$\text{one-sixth} = \frac{1}{6}$

Similarly:

$\text{one-seventh} = \frac{1}{7}$

$\text{one-eighth} = \frac{1}{8}$

$$\text{one-ninth} = \frac{1}{9}$$

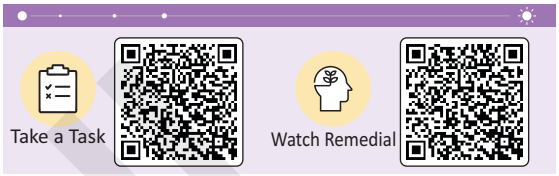
$$\text{one-tenth} = \frac{1}{10}$$

Unit Fractions

In the fractions, $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}$ etc., 1 is the numerator. So they are called **unit fractions**.

Thus, if in a fraction the numerator is 1, it is called **unit fraction**.

Like and Unlike Fractions



Look at the following fractions carefully:

$$\frac{2}{11}, \frac{3}{11}, \frac{4}{11}, \frac{5}{11}, \frac{6}{11}$$

All the fractions have same denominator i.e. 11. These fractions are called like fractions.

Thus, the fractions with same denominator are called like fractions.

On the other hand, the fractions $\frac{4}{5}, \frac{1}{2}, \frac{7}{8}, \frac{3}{11}$ etc. have different denominators. They are called unlike fractions.

Thus, the fractions having different denominators are called **unlike fractions**.

Exercise 7.2

Knowledge Application

1. Multiple Choice Questions (MCQs)

Choose the correct option:

(a) Which one is the unit fraction?

(i) $\frac{1}{2}$ (ii) $\frac{5}{8}$ (iii) $\frac{7}{12}$

(b) Which of the following have unlike fractions?

(i) $\frac{4}{9}, \frac{8}{9}, \frac{2}{9}, \frac{5}{9}$ (ii) $\frac{7}{8}, \frac{4}{8}, \frac{6}{8}, \frac{2}{8}$ (iii) $\frac{1}{3}, \frac{5}{8}, \frac{4}{5}, \frac{2}{6}$

(c) Which of the following have like fraction?

(i) $\frac{1}{5}, \frac{3}{11}, \frac{4}{11}, \frac{2}{3}$ (ii) $\frac{4}{19}, \frac{8}{19}, \frac{3}{19}, \frac{7}{19}$ (iii) $\frac{6}{8}, \frac{1}{9}, \frac{3}{7}, \frac{4}{13}$

2. Ring the unit fractions in the following :

$$\frac{1}{4}\ \frac{1}{3}\ \frac{5}{7}\ \frac{2}{3}\ \frac{1}{10}\ \frac{4}{7}\ \frac{4}{5}\ \frac{1}{8}\ \frac{1}{19}\ \frac{7}{11}\ \frac{15}{51}\ \frac{1}{99}$$

3. Write whether the following fractions are like or unlike:

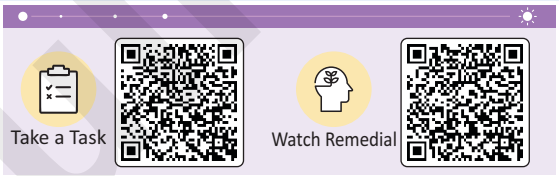
(a) $\frac{4}{7}, \frac{2}{7}, \frac{5}{7}, \frac{6}{7}, \frac{3}{7}, \ldots\ldots\ldots\ldots$

(b) $\frac{1}{4}, \frac{2}{5}, \frac{3}{4}, \frac{5}{7}, \ldots\ldots\ldots\ldots$

(c) $\frac{3}{11}, \frac{4}{11}, \frac{8}{11}, \frac{7}{11}, \frac{5}{11}, \ldots\ldots\ldots\ldots$

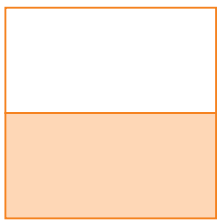
(d) $\frac{3}{8}, \frac{5}{8}, \frac{7}{8}, \frac{4}{8}, \frac{1}{8} \ldots\ldots\ldots\ldots$

(e) $\frac{2}{3}, \frac{1}{4}, \frac{5}{7}, \frac{8}{9}, \frac{1}{2}, \ldots\ldots\ldots\ldots$

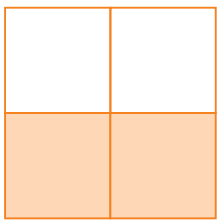


Equivalent Fractions

Look at the following squares of the same size:



Shaded part = $\frac{1}{2}$



Shaded part = $\frac{2}{4}$

We observe that the shaded parts (i.e. portions) of both the square are the same, or $\frac{1}{2} = \frac{2}{4}$.

Hence, $\frac{1}{2}$ and $\frac{2}{4}$ are equivalent fractions.

Study the shaded parts of the following five strips carefully:

Shaded part = $\frac{1}{2}$

Shaded part = $\frac{2}{4}$

Shaded part = $\frac{3}{6}$

Shaded part = $\frac{4}{8}$

Shaded part = $\frac{5}{10}$

In all the above strips, the shaded parts are equal.

Hence, we can say that $\frac{1}{2}=\frac{2}{4}=\frac{3}{6}=\frac{4}{8}=\frac{5}{10}$

So, $\frac{1}{2},\frac{2}{4},\frac{3}{6},\frac{4}{8},\frac{5}{10}$ are **equivalent fractions** and represent the same fraction $\frac{1}{2}$ (Half).

TYPE 1

Observe the following multiplication carefully:

$$\frac{1}{2}=\frac{1\times2}{2\times2}=\frac{2}{4},\quad \frac{1}{2}=\frac{1\times3}{2\times3}=\frac{3}{6},$$
$$\frac{1}{2}=\frac{1\times4}{2\times4}=\frac{4}{8},\quad \frac{1}{2}=\frac{1\times5}{2\times5}=\frac{5}{10}$$

We notice that if numerator and denominator of a fraction are multiplied by the same number, we get the equivalent fractions.

TYPE 2

Similarly, if numerator and denominator of a fraction is divided by the same number we get the equivalent fractions.

Consider the following equivalent fractions : $\frac{1}{5},\frac{2}{10},\frac{3}{15},\frac{4}{20},\frac{5}{25}$

$$\frac{2}{10}=\frac{2\div2}{10\div2}=\frac{1}{5},\quad \frac{3}{15}=\frac{3\div3}{15\div3}=\frac{1}{5},$$
$$\frac{4}{20}=\frac{4\div4}{20\div4}=\frac{1}{5},\quad \frac{5}{25}=\frac{5\div5}{25\div5}=\frac{1}{5}$$

TYPE 3

Let us take two equivalent fractions $\frac{1}{3}$ and $\frac{2}{6}$.

Multiply the denominator of $\frac{1}{3}$ by the numerator of $\frac{2}{6}$

to get $\boxed{3 \times 2 = 6}$

Also, multiply the numerator of $\frac{1}{3}$ by the denominator of $\frac{2}{6}$

to get $\boxed{1 \times 6 = 6}$

We see that both the products are same.

Once more, let us take two equivalent fractions $\frac{4}{5}$ and $\frac{8}{10}$.

Then, we have

$$\frac{4}{5} \quad \frac{8}{10}.$$

i.e. $4 \times 10 = 40$ and $5 \times 8 = 40$

We see that both the cross products are same.

Now, we can say that the two fractions are equivalent, if the products of the denominator of first fraction and numerator of second fraction is equal to the product of numerator of first fraction and denominator of second fraction.

Example 1 : Are the following fractions equivalent?

(i) $\frac{3}{8}$ and $\frac{4}{5}$ (ii) $\frac{8}{20}$ and $\frac{10}{25}$

Solution : (i) The given fractions are $\frac{3}{8}$ and $\frac{4}{5}$.

The product of numerator of $\frac{3}{8}$ and denominator of $\frac{4}{5}$

$= 3 \times 5 = 15$

The product of denominator of $\frac{3}{8}$ and numerator of $\frac{4}{5}$

$= 8 \times 4 = 32$

Since 15 is not equal to 32, therefore $\frac{3}{8}$ and $\frac{4}{5}$ are not equivalent fractions.

(ii) The given fractions are $\frac{8}{20}$ and $\frac{10}{25}$.

We have $\frac{8}{20}$ $\quad$ $\frac{10}{25}$

i.e. $8 \times 25 = 200$ and $20 \times 10 = 200$

Hence, $\frac{8}{20}$ and $\frac{10}{25}$ are equivalent fractions.

Exercise 7.3

Knowledge Application

1. Write 4 equivalent fractions of each of the following fractions:

[One have been done for you.]

(i) $\frac{3}{5} = \frac{3\times2}{5\times2} = \frac{3\times3}{5\times3} = \frac{3\times4}{5\times4} = \frac{3\times5}{5\times5}$, i.e., $\frac{3}{5} = \frac{6}{10} = \frac{9}{15} = \frac{12}{20} = \frac{15}{25}$

(ii) $\frac{1}{2}$ (iii) $\frac{1}{3}$ (iv) $\frac{4}{5}$ (v) $\frac{2}{3}$

2. Which pairs of fractional numbers are equivalent?

(i) $\frac{5}{16}, \frac{8}{20}$ (ii) $\frac{1}{3}, \frac{9}{27}$ (iii) $\frac{4}{14}, \frac{1}{7}$ (iv) $\frac{6}{18}, \frac{2}{9}$ (v) $\frac{4}{16}, \frac{8}{32}$

(vi) $\frac{7}{9}, \frac{14}{22}$ (vii) $\frac{1}{4}, \frac{7}{22}$ (viii) $\frac{4}{10}, \frac{10}{25}$ (ix) $\frac{6}{8}, \frac{16}{12}$ (x) $\frac{3}{18}, \frac{2}{37}$

(xi) $\frac{8}{25}, \frac{3}{19}$ (xii) $\frac{5}{8}, \frac{8}{25}$ (xiii) $\frac{2}{13}, \frac{3}{7}$

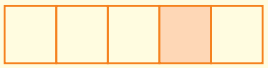
Think Tank

Gap Analyzer™
Take a Test

1. Tick (✓) the correct answer:

(a)  is equal to

(i) $\frac{1}{2}$ ☐ (ii) $\frac{1}{4}$ ☐ (iii) $\frac{4}{1}$ ☐

(b)  is equal to

(i) $\frac{1}{6}$ ☐ (ii) $\frac{1}{5}$ ☐ (iii) $\frac{2}{3}$ ☐

(c) 11 numerator and 7 denominator =

(i) $\frac{11}{7}$ ☐ (ii) $\frac{7}{11}$ ☐ (iii) Both ☐

(d) $\frac{1}{2}+\frac{1}{2}=$

(i) 1 ☐ (ii) $\frac{1}{2}$ ☐ (iii) $\frac{1}{4}$ ☐

2. Fill in the blanks:

	Numerator	Denominator		Fraction
(a)	3	5	=	_____
(b)	5	7	=	_____
(c)	6	11	=	_____
(d)	7	9	=	_____

3. Match the following:

(a) $\frac{3}{6}$ (i) 

(b) $\frac{1}{2}$ (ii) 

(c) $\frac{6}{8}$ (iii) 

(d) $\frac{3}{4}$ (iv) 

Custom Learning Path
Scan to Create Your Own Learning Path

Puzzle

Conceptual Learning

Fill in the boxes with the suitable fraction to complete the following:

(a) $\square + \square = 1$

(b) $\square + \square + \square + \square = 1$

(c) $\square + \square + \square + \square + \square = 1$

Mental Math

Critical Thinking

1. Write the numerator in the blanks to make a whole.

   (a) $\frac{\square}{9}$ (b) $\frac{\square}{18}$

2. Write the denominator in the blanks to make a whole.

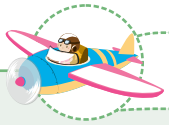
   (a) $\frac{4}{\square}$ (b) $\frac{9}{\square}$

3. What fraction of our National flag is green?

   (a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{2}{3}$ (d) none of these

4. What fraction of letters of the English alphabet are vowels.

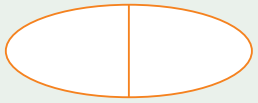
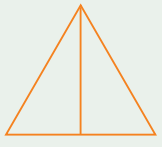
   (a) $\frac{21}{20}$ (b) $\frac{5}{21}$ (c) $\frac{5}{26}$ (d) none of these



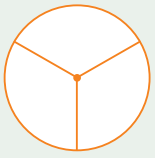
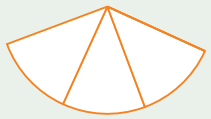
Fun Time Activity

integrated Learning

1. Colour half of each shape:

   (a)  (b)  (c) 

2. Colour one-third of each shape:

   (a)  (b)  (c) 

Maths Lab Activity

Collaboration

Learning objective: To practice basic fractions.

Materials required: Coloured paper of various shades, crayons/coloured pencils.

Procedure:

1. This is an individual activity.
2. Choose a leader to conduct the activity.
3. The leader asks the students to draw some shapes on a sheet of paper—a circle, a square, a triangle, or a rectangle.
4. Once the figures have been drawn, they are asked to colour a certain portion of the figure say, 1/2, 1/3, 1/4, 3/4 etc.

5. Stick small pieces of other coloured paper on the shaded parts.
6. When the activity gets complete, display them in the class.

HOTS

Critical Thinking

Look at the current year's calendar. Find the fraction of the number of Mondays to the total number of days in April.