Chapter 5

Fractions

5.1 We have read about fractions as equal divisions in primary classes. Let us revise that. When we distribute one Roti among 3 kids equally then every child will get $\frac{1}{3}$ of it and this is called one-third.

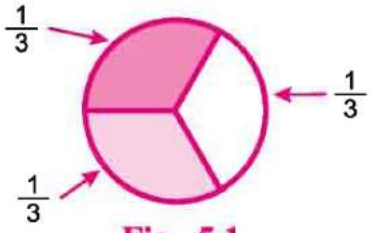


Fig. 5.1

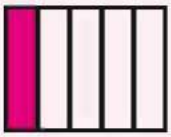
Do and Learn

Match the following images (coloured parts) with fractions:

(i)  $\frac{1}{5}$

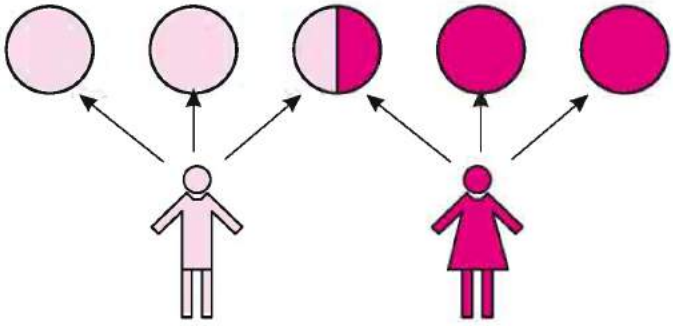
(ii)  $\frac{1}{4}$

(iii)  $\frac{1}{8}$

(iv)  $1+\frac{1}{2}$

Try to read these fractions.

Similarly when we distribute 5 chapatis between 2 children equally then we write like this.



$2+\frac{1}{2}$ (Two and one upon two)

Also understand the following

Right now we showed $\frac{3}{5}$ in a chapati. Think if we had three chapattis and we divide each of them into 5 parts, we take one divided part each then how much chapatis do the coloured parts represent? All of the three $\frac{1}{5}$ parts together represent $\frac{3}{5}$ parts of one chapatti.

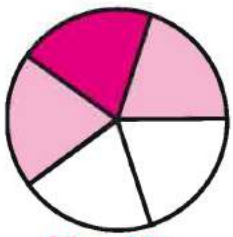
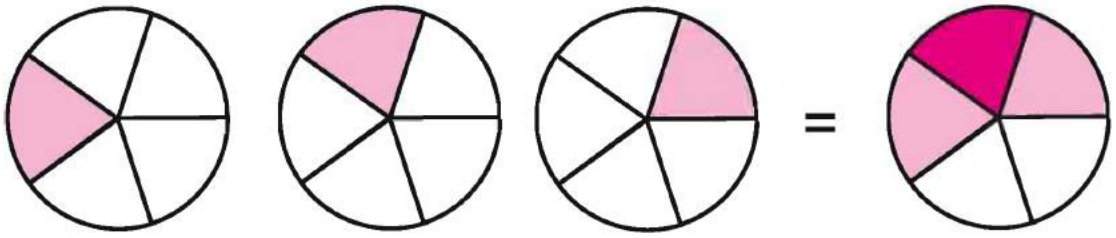


Fig. 5.2



$\frac{1}{5}$ $\frac{1}{5}$ $\frac{1}{5}$ $\frac{3}{5}$

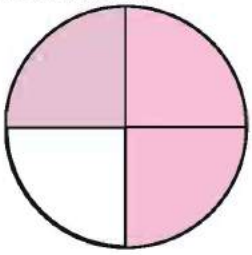
Fig. 5.3

But it should be kept in mind that as far as parts of the three chapattis are concerned, the coloured parts represent $\frac{1}{5}$ part of the three chapattis taken together.

We have learned about fractions in the form of equally divided parts. Now we try to understand the fraction in the form of parts of a Unit.

Lali had one big toffee on which there were marks of ten equal parts. In the school interval, Lali ate 3 equal parts of it. Think how much of the toffee Lali ate?

Equal parts of toffee eaten = 3
Total equal parts of toffee = 10
Toffee Lali ate = $\frac{3}{10}$ (Three upon Ten)



Similarly Vikram ate three equal parts of a chapatti, which was divided into 4 total equal parts in Mid Day Meal Programme. Then Roti eaten by Vikram

$$= \frac{\text{Parts of Roti eaten by Vikram}}{\text{Total parts of chapati}}$$

$$= \frac{3}{4}$$

The total number of divisions of a unit is called Denominator and some parts taken from that are called Numerator.

It is read as three upon Four or Three Fourths.

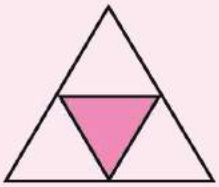
Thus think and tell if we take three out of five equal parts of a chapati then it will represent how much parts of that unit?

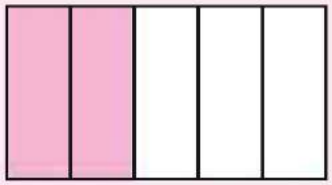
Yes! You got it right! = $\frac{3}{5}$ $\frac{\text{Numerator}}{\text{Denominator}}$

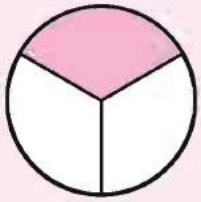
It is read as 3 upon 5. Here 3 is the numerator and 5 is the denominator.

Do and Learn

Write the shaded part of the following figures in the form of fractions:





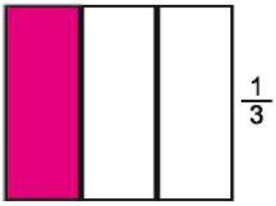


5.2 Explaining Fractions with the help of diagrams

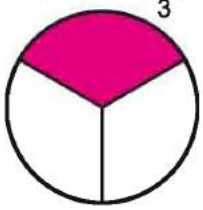
Till now we have learned about dividing fractions in equal parts and as parts of a unit. Now we will show fractions in figures/pictures/diagrams.

Representing $\frac{1}{3}$ with a diagram: Here 1 is numerator and 3 is denominator. Denominator shows in how many parts we have to divide unit. Here denominator is 3 then we will divide the unit in three equal parts.

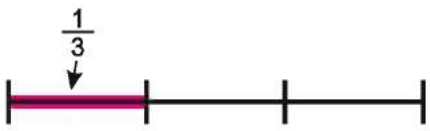
Seema drew a diagram and divided it in three equal parts.



John drew a circle and divided it into three equal parts.



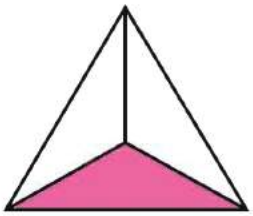
Fazloo made 1 inch long line and divided it into three equal parts.



In numerator 1 represent the taken or colored parts of the unit.

You can show $\frac{1}{3}$ by any diagrams provided that all three parts must be equal.

Look chanda showed $\frac{1}{3}$ in triangle.



Seema, John and Fazloo showed $\frac{1}{3}$ through different diagrams but one thing is common that in all three diagrams unit is divided into three equal parts and one of it is shaded.

Do and Learn

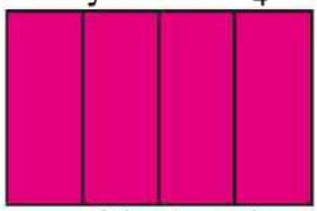
1. Which of the following diagram is right for $\frac{1}{3}$ and which is not. State the reason as well.

2. Show the following fractions by proper diagrams

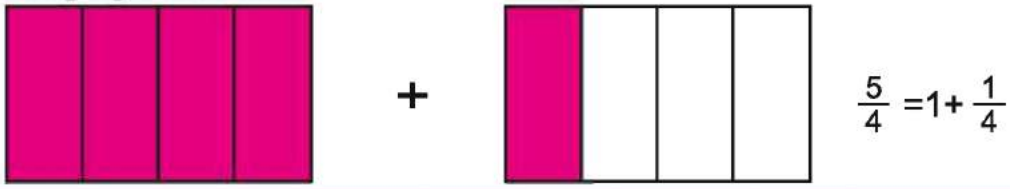
(i) $\frac{2}{3}$ (ii) $\frac{3}{4}$ (iii) $\frac{1}{5}$

5.3 Proper, Improper and mixed fractions

We have learned showing fractions by diagrams. Now can you show $\frac{5}{4}$ by diagram? In $\frac{5}{4}$, 5 is a numerator and 4 is denominator.



We know denominator shows the total equal parts of a unit. Therefore we draw a rectangle and divide it into 4 equal parts. Now In $\frac{5}{4}$5 is numerator and tells us that how many parts we have to take. But can we take 5 parts out of the 4equal parts. No, therefore we have to make one more unit and divide it again into 4 equal parts. Now we take all four parts from the first diagram and one from this another unit. Hence we take 5 coloured parts. This shows $\frac{5}{4}$, $\frac{5}{4}$ is also called an improper fraction. A fraction in which numerator is greater than or equal to denominator is called improper fraction.



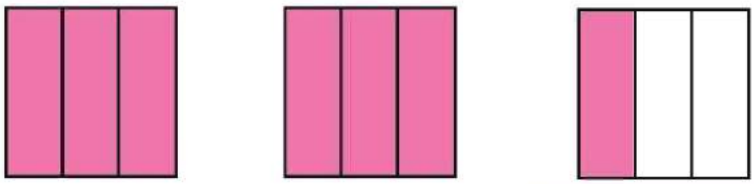
Proper fraction shows parts of a unit. Can you define proper fraction? Discuss with your friends about it.

5.3.1 Showing improper fraction in form of mixed fraction

Improper fractions can be shown in form of addition of units and proper fraction. This is called mixed fraction. Like $\frac{5}{4} = 1 + \frac{1}{4}$ or $1\frac{1}{4}$ It is read as a one and one upon four.

Example 1 show the improper fraction $\frac{7}{3}$ diagram and write it in the form of mixed fraction.

Solution In $\frac{7}{3}$ denominator is 3. Therefore we have to divide the unit into three equal parts. Numerator is 7 therefore we have to color 7 such parts. For it we will take three units and color total seven parts.



$$\frac{7}{3} = 2 + \frac{1}{3}$$

therefore mixed form of $\frac{7}{3}$

$$\frac{7}{3} = 2\frac{1}{3}$$

It is read as seven upon three or two and one upon three. Rashmi has put some pieces of khakhre. Looking at these write them in the fractions and tell us which is proper and improper fraction.

Converting improper fraction to mixed fraction

3) 7(2

$\frac{-6}{1} = 2\frac{1}{3}$

= Quotient $\frac{\text{Reminder}}{\text{Divisor}}$

	$\frac{1}{4}$	Proper

Example 2 Express the following in the form of mixed fractions.

(i) $\frac{19}{4}$ (ii) $\frac{23}{6}$

Solution (i) $\frac{19}{4}$

$$\begin{array}{r} 4)19(4 \\ \underline{-16} \\ 3 \end{array}$$

Divisor = 4
Quotient = 4
Remainder = 3

Hence $\frac{19}{4}$ = 4 unit and $\frac{3}{4}$ or $4\frac{3}{4}$

Solution (ii) $\frac{23}{6}$

$$\begin{array}{r} 6)23(3 \\ \underline{-18} \\ 5 \end{array}$$

Divisor = 6
Quotient = 3
Remainder = 5

Hence $\frac{23}{6}$ = 3 unit and $\frac{5}{6}$ or $3\frac{5}{6}$

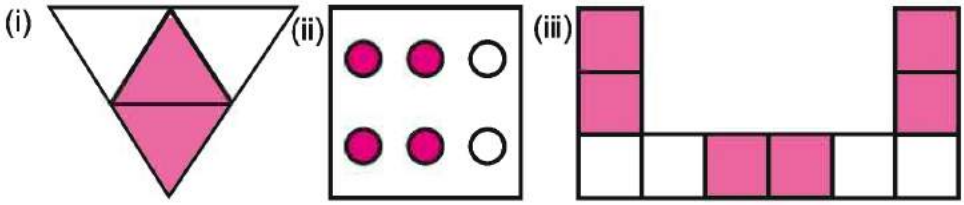
Do and Learn

Express the following mixed fractions into improper fractions

(i) $3\frac{2}{3}$ (ii) $7\frac{1}{9}$

Exercise 5.1

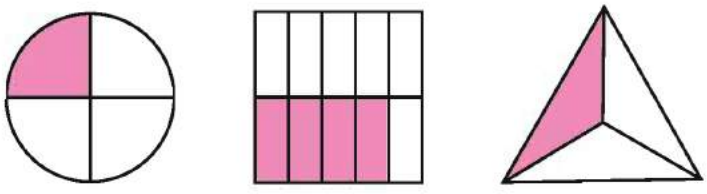
1. Write the fractions to represent shaded parts of the following:



2. Show the following fractions by diagrams:

(i) $\frac{3}{5}$ (ii) $\frac{5}{4}$ (iii) $\frac{3}{6}$ (iv) $2\frac{2}{5}$

3. What is the fraction for 35 minutes to 1 hour?
4. Write the fraction for even numbers 1 to 15 to number 1 to 15?
5. Look at the following figures and write the fraction for its uncolored parts.

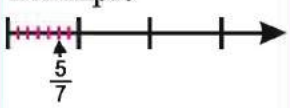


(i) (ii) (iii)

6. Show the following fractions on number line.

(i) $\frac{3}{5}$ (ii) $\frac{3}{7}$ (iii) $\frac{8}{3}$

Example



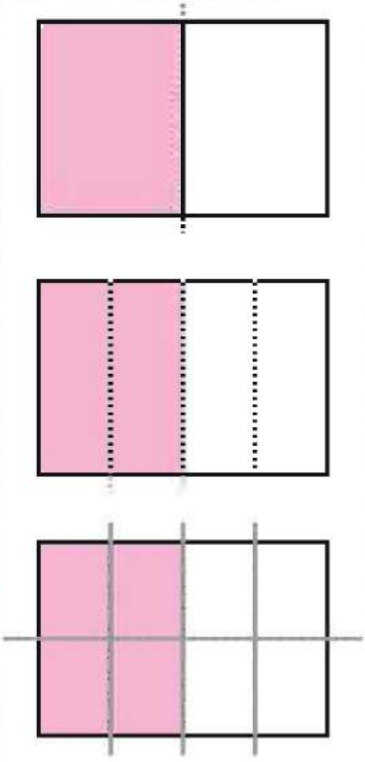
7. Express the following in mixed fractions.

(i) $\frac{20}{3}$ (ii) $\frac{11}{5}$ (iii) $\frac{19}{6}$

8. Express the following in improper fractions.

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

5.4 Like Fractions



Janhawi and Devansh learned how to show fraction by diagrams. Then their teacher took one paper and fold it by half and asked

Teacher : one part of it shows which fraction?

Jahnvi: $\frac{1}{2}$ (one upon two)

Teacher: Let's color one part of it. Now play with it , folding it two more times. Now what will be the fraction for is colored part?

Devansh: Paper is divided into 4 equal parts and its color parts are 2.So it shows $\frac{2}{4}$

Janhvi: Here $\frac{1}{2}$ and $\frac{2}{4}$ showing equally colored parts of the same original part.

Teacher: You are right Janhvi. Fractions which show Equal parts are called like fractions. We write it like this:

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

Folding this paper three times shows $\frac{4}{8}$

Activity: Take a paper with your friend and color it half. Fold it differently and write the respective fraction. But be aware that all parts should be equal while folding.

Devansh: I can make equivalent fractions even without folding the paper.

$\frac{1}{2} \times \frac{2}{2} = \frac{2}{4}$, $\frac{1}{2} \times \frac{3}{3} = \frac{3}{6}$, $\frac{1}{2} \times \frac{4}{4} = \frac{4}{8}$

Teacher: Devansh you got the right pattern. Multiplying numerator and denominator of a fraction by same number we will get the equivalent fraction. In some cases, we can also get equal fractions by division, like $\frac{12}{16}$

Understand like fractions by diagrams.

Are all the colored parts of unit in following diagrams equal? Then it is also a like fraction.

$\frac{1}{3}$

$\frac{2}{6}$

$\frac{3}{9}$

$\frac{4}{12}$

Example 3 Make equivalent fractions of $\frac{1}{4}$

Solution $\frac{1}{4} \times \frac{2}{2} = \frac{2}{8}$, $\frac{1}{4} \times \frac{3}{3} = \frac{3}{12}$

Hence equivalent fraction of $\frac{1}{4}$

$\frac{1}{4} = \frac{2}{8} = \frac{3}{12}$

Example 4 Make equivalent fractions of $\frac{3}{6}$

Solution $\frac{3 \div 3}{6 \div 3} = \frac{1}{2}$, $\frac{3 \times 2}{6 \times 2} = \frac{6}{12}$, $\frac{3 \times 3}{6 \times 3} = \frac{9}{18}$

We can make more like fractions of $\frac{3}{6}$ by its like fraction $\frac{1}{2}$

Simplified form of equivalent fractions are those in which numerator and denominator are co-prime numbers for example $\frac{8}{14}$ can be simplified as $\frac{4}{7}$ in which 4 and 7 are mutually indivsible.

Example 5 $\frac{3}{4}$ are $\frac{6}{9}$ and like fractions, find out ?

Solution **Method 1:** $\frac{3}{4}$ is a simple fraction since 3 and 4 both are only divisible by 1.Simple form of $\frac{6}{9}$ is $\frac{2}{3}$ (dividing numerator and denominator by 3) Hence $\frac{3}{4}$ and $\frac{2}{3}$ are not like fractions.

Hence $\frac{3}{4}$ and $\frac{6}{9}$ are not equivalent fractions.

Method 2: $\frac{3}{4} \times \frac{2}{2} = \frac{6}{8}$

$\frac{3}{4} \times \frac{3}{3} = \frac{9}{12}$

Hence $\frac{3}{4}$ and $\frac{6}{9}$ are not equivalent fractions. Therefore $\frac{3}{4}$ and $\frac{6}{9}$ are not equivalent fractions.

Do and Learn

1. Make three equivalent fractions of the following:
   (i) $\frac{3}{4}$ (ii) $\frac{1}{3}$ (iii) $\frac{2}{7}$

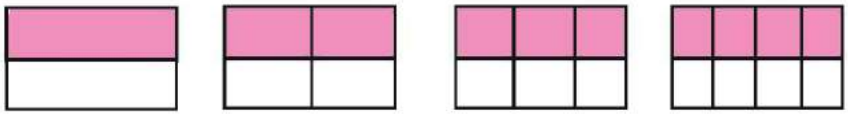
2. Check which are the equivalent fractions of the following?
   (i) $\frac{5}{10}$ and $\frac{1}{2}$ (ii) $\frac{3}{7}$ and $\frac{11}{13}$

All those fractions which have same denominators are called like fractions. Such as $\frac{1}{5}, \frac{3}{5}, \frac{6}{5}$ .Do remember no equivalent fraction is like fraction. Think why?

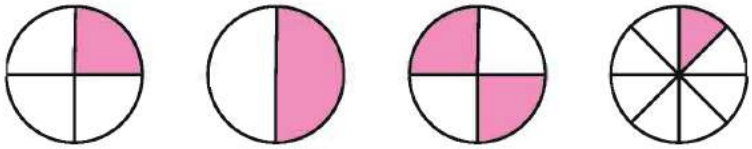
Exercise 5.2

1. Write fraction for shaded part of each diagram are the equivalent fraction?

(i)



(ii)



2. Replace the following each empty box with proper number
   (i) $\frac{3}{7} = \frac{6}{\square}$ (ii) $\frac{8}{6} = \frac{4}{\square}$ (iii) $\frac{3}{5} = \frac{\square}{20}$ (iv) $\frac{100}{10} = \frac{10}{\square}$ (v) $\frac{18}{24} = \frac{\square}{4}$

3. Find the equivalent fraction of $\frac{3}{4}$ whose

(i) Denominator 24 (ii) Numerator 15 (iii) Denominator 32 (iv) Numerator 9

4. Convert the following fractions into simplified form
   (i) $\frac{15}{27}$ (ii) $\frac{84}{98}$ (iii) $\frac{21}{49}$ (iv) $\frac{6}{72}$

5. Match the equivalent fractions

(i) $\frac{25}{40}$	(a) $\frac{30}{36}$
(ii) $\frac{250}{100}$	(b) $\frac{8}{7}$
(iii) $\frac{180}{200}$	(c) $\frac{25}{5}$
(iv) $\frac{2}{3}$	(d) $\frac{5}{8}$
(v) $\frac{9}{13}$	(e) $\frac{27}{39}$
(vi) $\frac{500}{100}$	(f) $\frac{5}{2}$
(vii) $\frac{3}{4}$	(g) $\frac{100}{150}$
(viii) $\frac{16}{14}$	(h) $\frac{9}{10}$
(ix) $\frac{1}{2}$	(i) $\frac{600}{800}$
(x) $\frac{5}{6}$	(j) $\frac{3}{6}$

5.5 Comparison of fractions

Can you compare fractions like numbers 18,28,81....etc?

In comparison of numbers you have to find out smaller, greater numbers, such as 526 is smaller than 702. For comparison of fraction what rules can be followed? Let's see.

5.5.1 Comparison of fraction with same numerator

Look at the following fractions

$$\frac{1}{3},\ \frac{4}{5},\ \frac{7}{3},\ \frac{8}{5},\ 2\frac{1}{4},\ 3\frac{3}{4},\ \frac{1}{5}$$

$\frac{1}{3}, \frac{1}{5}$ are called unit fractions because it shows only one of the total parts of the unit.

$\frac{1}{3}$ 

$\frac{1}{5}$ 

Look at the above diagram and state which fraction is smaller $\frac{1}{3}$ or $\frac{1}{5}$

Similarly which is greater in $\frac{1}{4}$ and $\frac{1}{7}$

$\frac{1}{4}$ means one of the four parts of a unit.

$\frac{1}{7}$ means one of the 7 parts of a unit. Hence $\frac{1}{7}$ is smaller than $\frac{1}{4}$

Can you really make rules for comparisons of fractions.

If numerators of two fractions are same then fraction with smaller denominator is greater.

Example 6 Which is greater in $\frac{3}{5}$ and $\frac{3}{7}$

Solution Here unit fraction of $\frac{3}{5}$ is $\frac{1}{5}$

and $\frac{1}{7}$ is unit fraction of $\frac{3}{7}$

We know that $\frac{1}{5}$ is greater than $\frac{1}{7}$

Hence $\frac{3}{5} > \frac{3}{7}$

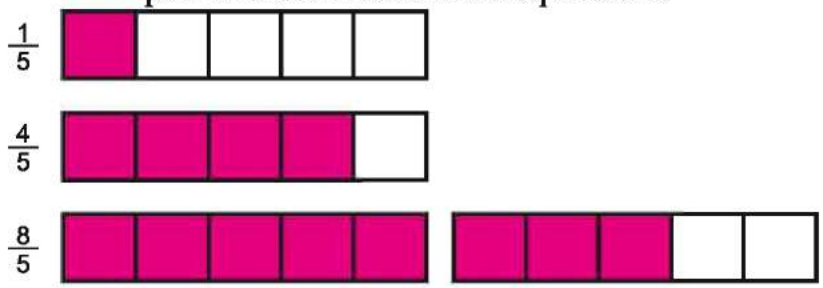
Do and Learn

1. Dolly get a $\frac{1}{5}$ of the cake and teenu gets $\frac{1}{7}$ of the cake. Then who got the more cake.
2. Which fraction is greater?

(i) $\frac{1}{3}$ and $\frac{1}{5}$ (ii) $\frac{2}{5}$ and $\frac{2}{7}$

5.5.2 Comparison of fractions with same denominators.

$\frac{1}{5}, \frac{4}{5}, \frac{8}{5}$ are different fractions with the same denominator. The smallest part of these fractions are equivalent.



Looking at the diagrams above we can say that among fractions with the same denominator, that fraction is greatest which has the greatest numerator.

Hence $\frac{8}{5} > \frac{4}{5}$ and $\frac{1}{5}$, Similarly $\frac{4}{5} > \frac{1}{5}$

Writing from greater to smaller like this $\frac{8}{5} > \frac{4}{5} > \frac{1}{5}$ is known as decending order.

Writing from smaller to greater like this $\frac{1}{5} < \frac{4}{5} < \frac{8}{5}$ is known as ascending order.

Do and Learn

Write the following in ascending and descending order

(i) $\frac{3}{7}, \frac{1}{7}, \frac{4}{7}, \frac{8}{7}, \frac{6}{7}$

(ii) $\frac{4}{13}, \frac{12}{13}, \frac{8}{13}$

5.5.3 Comparison of fractions with different numerators and denominators.

Let's assume that you want to compare $\frac{2}{3}$ and $\frac{3}{4}$ Then we will first make its like fractions

$$\frac{2}{3} = \frac{4}{6} = \frac{6}{9} = \frac{8}{12} = \frac{10}{15} \text{ and } \frac{3}{4} = \frac{6}{8} = \frac{9}{12} = \frac{12}{16}$$

Hence between $\frac{2}{3}$ and $\frac{3}{4}$ Like fractions with common denominator are $\frac{8}{12}$ and $\frac{9}{12}$

Hence between $\frac{2}{3} = \frac{8}{12}$ and $\frac{3}{4} = \frac{9}{12}$ we see $\frac{8}{12} < \frac{9}{12}$ or $\frac{2}{3} < \frac{3}{4}$

Example 7 Which fraction is greater between $\frac{3}{4}$ and $\frac{5}{8}$

Solution These are fractions with different numerators and denominators.

Let's find out like fractions of these

$$\frac{3}{5} = \frac{6}{10} = \frac{9}{15} = \frac{12}{20} = \frac{15}{25} = \frac{18}{30} = \frac{21}{35} = \frac{24}{40} = \frac{27}{45}$$

$$\text{and } \frac{5}{8} = \frac{10}{16} = \frac{15}{24} = \frac{20}{32} = \frac{25}{40} = \frac{30}{48} = \frac{35}{56}$$

Like fractions with common denominators are:

$$\frac{3}{5} = \frac{24}{40} \text{ and } \frac{5}{8} = \frac{25}{40}$$

Since $\frac{25}{40} > \frac{24}{40}$ Therefore $\frac{5}{8} > \frac{3}{5}$

Think if we have to compare bigger unlike fraction then it will be complicated to solve. In this case, we have to compare by like fraction with the help of common multiple.

Example 8 compare $\frac{7}{8}$ and $\frac{7}{10}$

Solution These fractions have different denominators.

In $\frac{7}{8}$ and $\frac{7}{10}$ multiple of denominator 8 are 8,16....

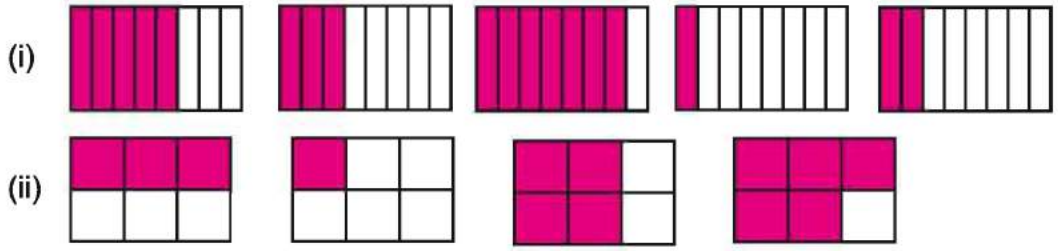
And similarly multiple of 10 are 10,20.... Hence 40 is the common multiple. $\frac{7}{8} \times \frac{5}{5} = \frac{35}{40}$; $\frac{7}{10} \times \frac{4}{4} = \frac{28}{40}$

Hence $\frac{7}{8} = \frac{35}{40}$ and $\frac{7}{10} = \frac{28}{40}$

Since $\frac{35}{40} > \frac{28}{40}$ Therefore $\frac{7}{8} > \frac{7}{10}$

Exercise 5.3

1. Write fractions for each of the following diagram and then arrange them in ascending and descending order.



2. Compare the two fractions and put a sign (<,> or =)

(i) $\frac{5}{6} \square \frac{9}{11}$ (ii) $\frac{3}{4} \square \frac{1}{5}$ (iii) $\frac{3}{5} \square \frac{3}{7}$

3. All the following fraction represent three different numbers. Convert these in simple form and write these in groups of those three.

(i) $\frac{2}{12}$ (ii) $\frac{3}{15}$ (iii) $\frac{8}{50}$ (iv) $\frac{16}{100}$

(v) $\frac{10}{60}$ (vi) $\frac{15}{75}$ (vii) $\frac{18}{90}$ (viii) $\frac{16}{96}$

(ix) $\frac{12}{75}$ (x) $\frac{12}{72}$ (xi) $\frac{10}{50}$ (xii) $\frac{4}{25}$

4. Answer the following and show how did you solve these ?

   (i) are $\frac{12}{15}$ & $\frac{15}{30}$ equal ? (iii) are $\frac{3}{5}$ & $\frac{9}{15}$ equal ?

   (ii) are $\frac{4}{5}$ & $\frac{5}{6}$ equal ? (iv) are $\frac{9}{16}$ & $\frac{5}{9}$ equal ?

5. 20 Students passed with first division in the class A of 25 students. In class B, 24 students passed with first division out of 30 student? From which class more part of students passed with first division?

6. Rohit eats 4 chapatis out of total 8. Rohini eats $\frac{1}{4}$ of total 8 chapatis. Who ate less?

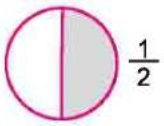
5.6 Addition of fractions

While representing fractions, we have learned that we can write $\frac{3}{5}$ in two ways.

In unit $\frac{3}{5}$

$\frac{1}{5}$ $\frac{1}{5}$ $\frac{1}{5}$ $\frac{3}{5}$

In form of addition of different units $\frac{3}{5}$ Can we add $\frac{1}{2}$ and $\frac{1}{3}$ like this.



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

As we have seen in addition of numbers, example 333+40 = 373. Here 1 is the smallest unit of 333 and of 40 as well (add 1 up to 40 times). Therefore we can add all those numbers which have same smallest unit.

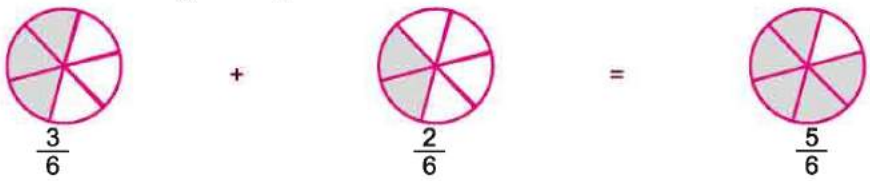
Units are different in $\frac{1}{2}$ and $\frac{1}{3}$ making equivalent fractions of these fractions.

$\frac{1}{2} = \frac{2}{4} = \left(\frac{3}{6}\right) = \frac{4}{8} = \frac{5}{10}$ and $\frac{1}{3} = \left(\frac{2}{6}\right) = \frac{3}{9} = \frac{4}{12} = \frac{1}{3}$

Therefore $\frac{1}{2} = \frac{3}{6}$ and $\frac{1}{3} = \frac{2}{6}$

Shows fractions with similar units, where $\frac{1}{6}$ is like and smallest unit.

Representing $\frac{3}{6}$ and $\frac{2}{6}$ by diagrams



$\frac{3}{6}$ $\frac{2}{6}$ $\frac{5}{6}$

One more method for adding fractions with different denominators is L.C.M

$$\frac{1}{2} + \frac{1}{3}$$

$$\frac{(1\text{x}3) + (1\text{x}2)}{6}$$

$$= \frac{3+2}{6} = \frac{5}{6}$$

Step1 : Take L.C.M of 2 and 3 which is 6.

Step 2 : Divide L.C.M 6 by denominator of $\frac{1}{2}$ i.e 2 we will get quotient 3, now multiply 3 by numerator 1. Similarly for fraction $\frac{1}{3}$ divide L.C.M 6 by denominator 3. We will get quotient 2, multiply it with 1 the numerator.

Step 3 : Add the products.

Do and Learn

Solve the following:

(i) $\frac{1}{3} + \frac{2}{3}$ (ii) $\frac{3}{5} + \frac{2}{7}$ (iii) $\frac{4}{5} + \frac{7}{15}$

5.6.1 Addition of mixed fractions

Mixed fractions can be added by two methods.

1. Add whole parts of mixed fraction and improper parts of mixed fraction separately.
2. Add mixed fractions after converting them to improper fractions.

$$2\frac{3}{4} + 5\frac{4}{5}$$

$$2 + 5 + \frac{3}{4} + \frac{4}{5}$$

$$7 + \frac{3}{4} + \frac{4}{5}$$

$$\frac{3}{4} + \frac{4}{5} = \frac{3\text{x}5}{4\text{x}5} + \frac{4\text{x}4}{5\text{x}4} \quad \text{(L.C.M of 4 and 5=20)}$$

$$= \frac{15}{20} + \frac{16}{20} = \frac{31}{20}$$

$$= 1 + \frac{11}{20} \left(\text{converting } \frac{31}{20} \text{ into mixed fraction}\right)$$

Again $7 + \frac{3}{4} + \frac{4}{5} = 7 + 1 + \frac{11}{20}$

$$= 8 + \frac{11}{20} = 8\frac{11}{20}$$

$$\therefore 2\frac{3}{4} + 5\frac{4}{5} = 8\frac{11}{20}$$

Addition of mixed fraction after converting into improper fraction.

$$2\frac{3}{4} + 5\frac{4}{5}$$

$$= \frac{11}{4} + \frac{29}{5}$$

$$= \frac{11 \text{ x } 5}{4 \text{ x } 5} + \frac{29 \text{ x } 4}{5 \text{ x } 4}$$

$$= \frac{55}{20} + \frac{116}{20} = \frac{171}{20} = 8\frac{11}{20}$$

Exercise 5.4

1. Solve the following:

(i) $\frac{5}{19} + \frac{2}{19}$ (ii) $\frac{1}{6} + \frac{1}{6} + \frac{1}{6}$ (iii) $\frac{12}{23} + \frac{27}{23} + \frac{10}{23}$

(iv) $\frac{4}{7} + \frac{3}{14}$ (v) $\frac{2}{5} + \frac{3}{4} + \frac{5}{3}$ (vi) $\frac{17}{6} + \frac{18}{5}$

(vii) $4\frac{1}{3} + 3\frac{1}{3}$ (viii) $5\frac{3}{5} + 3\frac{5}{7}$

2. Sunita got $\frac{1}{4}$ part and marry got $\frac{1}{4}$ arts of a mango. Both will get how much part of mango all together.
3. Reshma purchased $\frac{1}{3}$ meter and jaya purchased $\frac{3}{5}$ meter of ribbon. Find out the total length of ribbon they purchased.
4. Ramesh covered $4\frac{1}{4}$ km of distance by bus and he walked $\frac{3}{4}$ km distance to reach school from home. How much total distance he covered to reach school.
5. Amit took $\frac{1}{2}$ litre milk first day, $\frac{3}{4}$ litre second day and $1\frac{1}{4}$ litre third day. Find out how much total milk he took in these three days.
6. Devansh painted the $\frac{2}{3}$ part of a wall of his room. His sister Janhvi helped him and painted $\frac{1}{3}$ part of the same wall. Find out how much part of the room they painted altogether.

5.7 Subtraction of fractions

For subtraction of fractions we will use the same method as we used for addition of fractions.

(i) Subtract $\frac{5}{8}$ from $\frac{7}{8}$

Here denominators of $\frac{7}{8}$ and $\frac{5}{8}$ are equal. Therefore we will just subtract numerator without doing anything with denominator.

Hence $\frac{7}{8} - \frac{5}{8} = \frac{7-5}{8} = \frac{2}{8} = \frac{1}{4}$

(ii) Subtract $\frac{2}{5}$ from $\frac{8}{6}$

Now denominators are different here. So we will find out like fractions of these with the same denominator.

$\frac{8}{6} = \frac{8 \times 5}{6 \times 5} = \frac{40}{30}$, $\frac{2}{5} = \frac{2 \times 6}{5 \times 6} = \frac{12}{30}$

$\frac{40}{30} - \frac{12}{30} = \frac{28}{30} = \frac{14}{15}$

Hence $\frac{8}{6} - \frac{2}{5} = \frac{14}{15}$

LCM Method

$\frac{8}{6} - \frac{2}{5}$ Here LCM of 6 & 5 is 30

$= \frac{(8\times5) - (2\times6)}{30}$

$= \frac{40 - 12}{30} = \frac{28}{30}$

$\frac{28}{30}$ Simplfying $\frac{14}{15}$

(iii) Solve $7\frac{1}{6} - 5\frac{2}{5}$

Subtraction in mixed fraction is easy by converting them to improper fractions. Therefore we will here study only these type of subtractions.

$$7\frac{1}{6} = \frac{43}{6}, \quad 5\frac{1}{4} = \frac{21}{4}$$

$$\therefore 7\frac{1}{6} - 5\frac{1}{4} = \frac{43}{6} - \frac{21}{4}$$

Now we will find out like fractions of both fractions and will subtract them.

$$\frac{43 \times 2}{6 \times 2} - \frac{21 \times 3}{4 \times 3}$$

$$\frac{86}{12} - \frac{63}{12}$$

$$= \frac{86-63}{12} = \frac{23}{12} = 1\frac{11}{12}$$

Therefore $7\frac{1}{6} - 5\frac{1}{4} = 1\frac{11}{12}$

First of all, we will convert mixed fraction into improper fraction. Then will find out like fractions of these and subtract.

Exercise 5.5

1. Solve the following

(i) $\frac{6}{5} - \frac{2}{5}$ (ii) $\frac{4}{5} - \frac{3}{7}$

(iii) $5\frac{1}{2} - 2\frac{1}{5}$ (iv) $8\frac{1}{4} - 2\frac{5}{6}$

(v) $\frac{17}{6} - \frac{9}{4}$ (vi) $\frac{3}{4} - \left(\frac{2}{5} + \frac{1}{4}\right)$

2. Heera gave $\frac{3}{7}$ litre milk to Bhavna out of her $\frac{1}{4}$ liter milk. How much of milk is now left with her.
3. A wooden piece is $\frac{9}{10}$ meter long and a $\frac{2}{5}$ meter long piece has been cut from it. What is the length of the remaining piece.
4. Anshul drink $\frac{2}{3}$ of one glass water. Find out how much water is left in the glass?
5. Sunil purchased $5\frac{1}{2}$ kg and Vijay purchased $3\frac{4}{5}$ kg mangoes. Find how much more mangoes did sunil purchased?

6. Neha finished one race in $3\frac{1}{2}$ minute and Geeta in $\frac{13}{4}$ minutes. Find out who finished the race in lesser time and how much time?

7. Complete the following addition and subtraction table:

(i)

⊖ \ ⊕			
	$\frac{2}{5}$	$\frac{4}{5}$	
	$\frac{1}{5}$	$\frac{2}{5}$	

(ii)

⊖ \ ⊕			
	$\frac{1}{3}$	$\frac{1}{5}$	
	$\frac{1}{5}$	$\frac{1}{6}$	

We learnt

1. Fraction is a number that represent part of a whole unit all. Whole can be only one object or can also be a group of objects. In any case, to express counted parts of a unit into fraction, it is necessary that all parts must be equal.

2. In Fraction $\frac{5}{7}$, 5 is numerator and 7 is denominator.

3. In a proper fraction numerator is smaller than denominator and in improper fraction numerator is always greater than denominator. Improper fraction can also be written as whole units and one part. In this case it gets converted into mixed fraction.

4. Two fractions are called like fractions if both of these represent same quantity. There are many like fractions of each proper or improper fraction.To find out a like fraction, we can multiply or divide numerator and denominator both with any number except zero.

5. Simple form of a fraction is that, when its numerator and denominator both does not have any common factor except 1.