# MATHEMATICS–4

## SEMESTER

### 2

# CONTENTS

# Fractions

## LESSON PLAN

### SPECIFIC OBJECTIVES

The students will
- ❍ revise the concepts learnt in previous classes.
- ❍ know the equivalent fractions.
- ❍ learn to reduce a fraction to lowest term.
- ❍ know the types of fractions.
- ❍ understand like and unlike fractions and be able to convert unlike fractions into like fractions.
- ❍ learn comparing and ordering the given fractions.
- ❍ know how to add/subtract like and unlike fractions as well as mixed/improper fractions.
- ❍ know the use of fractions and their operations in daily life activities.
- ❍ learn how to divide a paper strip into several parts.

## CONTENTS EXPLAINED INSIDE THE CHAPTER
- ❍ Equivalent Fractions (page 69)
- ❍ Equivalent Fractions (By Multiplication) (Pages 69–70)
- ❍ Equivalent Fractions (By Division) (pages 70–71)
- ❍ Checking Equivalence of Fractions (pages 71–72)
- ❍ Reducing Fractions to Lowest Terms (pages 73–74)
- ❍ Types of Fractions (pages 74–75)
- ❍ Like and Unlike Fractions (pages 75–76)
- ❍ Comparison of Fractions (pages 77–80)
- ❍ Addition and Subtraction of Like Fractions (pages 80–82)
- ❍ Addition and Subtraction of Unlike Fractions (pages 82–83)
- ❍ Addition and Subtraction of Mixed or Improper Fractions (pages 83–84)
- ❍ Word Problems (pages 84–86)

## TEACHING AIDS

A pencil, a marker, a ruled sheet of paper, a pair of scissors, paper, a strip, glue, etc.

## TEACHING STRATEGY

○ Since the students are familiar with fractions, the teacher should ask them to complete the 'Let Us Recall' exercise to recall the concept.

○ Next, the teacher should teach them the idea of equivalent fractions. For better understanding, she may involve them in performing an activity using paper folding and shading. To do this, she can make groups of 2–3 students and provide them circular cutouts of paper. She should ask each group to divide these pieces into halves, fourths and, eighths respectively. Then, she should ask them to shade 1 part, 2 parts and 4 parts out of the total parts of the figure and compare the shaded parts. Who shades more fraction? They will observe as follows:

Student A      Student B      Student C



$\dfrac{1}{2}$ part      $\dfrac{2}{4}$ part      $\dfrac{4}{8}$ part
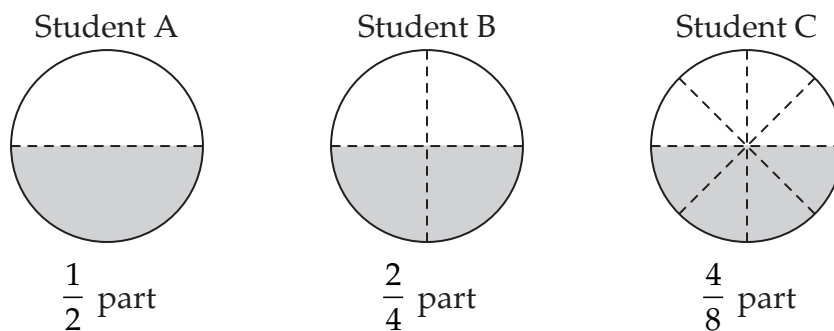
All the three students shade equal fractions, that means, $\dfrac{1}{2} = \dfrac{2}{4} = \dfrac{4}{8}$, i.e., equivalent.

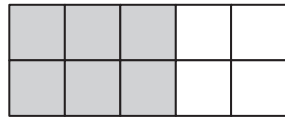Then, the teacher should go to pages 69–72 for text and exercise.

○ After that, the teacher should explain them how to reduce fractions to lowest terms by giving suitable examples. For text and exercise, she should go to pages 73–74.

○ Further, she should talk them about the types of fractions given on page 74 and then introduce to them about like and unlike fractions. She should also explain them how to convert unlike fractions into like fractions. Hence, she should ask them to do exercise 1.3.

○ Thereafter, the teacher should teach them the comparison of fractions and encourage them to order the fractions. For text and exercise, she should go to pages 77–80.

○ Further, the teacher should explain addition and subtraction of like fractions involving the students in an activity as given below.

● She should provide a piece of grid paper to every group of 2–3 students. Then, she should ask each student to shade few small squares and write the corresponding fraction. Then, they will get the fraction of total shade. For example,

Student A shades $\dfrac{2}{12}$ part. ⟶  ⟵ Student B shades $\dfrac{5}{12}$ part.
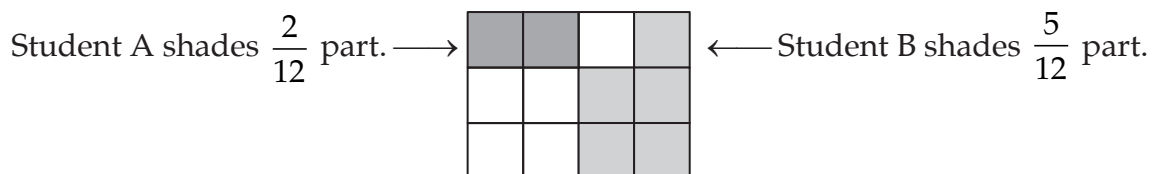
Together, they shade $\dfrac{7}{12}$ parts. Thus, $\dfrac{2}{12} + \dfrac{5}{12} = \dfrac{7}{12}$
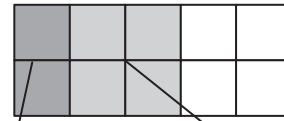
- Again, she should ask them to perform in pairs such that one student shades few squares and other student shades fewer squares over the squares shaded by first student. Then, they will find the fraction of single shaded squares. For example,

Student A shades $\dfrac{6}{10}$ squares.　　　　　Student B shades $\dfrac{2}{10}$ parts over the first shade.

$\dfrac{6}{10}$ part shaded　　　　　　　　　　$\dfrac{2}{10}$ part　　　$\dfrac{4}{10}$ part left

　　　　　　　　　　　　　　　　　　double shaded　　with single shade

Thus,　　　　　　　　　　　$\dfrac{6}{10} - \dfrac{2}{10} = \dfrac{4}{10}$

Hence, she should go to pages 80–82 for text and exercise.

○ After that, she should motivate them to add or subtract unlike fractions by changing them into like fractions mathematically. She should explain to them the process of adding or subtracting mixed/improper fractions. Finally, she should go to pages 82–84 for text and exercise.

○ Now, the teacher should talk them about the use of fraction in daily life activities and explain to them how to resolve the problems.

○ Thereafter, she should encourage them to enjoy the Maths Lab Activity and using this concept, complete the project work.

## EXPECTED LEARNING OUTCOMES

Students are able to

○ understand the equivalent fractions and find the fractions equivalent to given fractions.

○ minimise the fractions to its lowest term.

○ categorise the given fractions.

○ convert mixed fractions into improper fractions and vice-versa.

○ understand like and unlike fractions and change unlike fractions into like fractions.

○ compare and order the given two or more fractions.

○ add/subtract like, unlike and mixed/improper fractions.

○ solve the daily life problems involving fractions.

○ divide the paper strip equally and conveniently into any number of pairs.

## SUGGESTED WORKSHEET

The teacher may provide this worksheet to the students and ask them to colour the grids using the given colour key.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| $1/6 + 1/6$ | $1/7 + 1/7$ | $1/8 + 2/8$ | $1/8 + 1/8$ | $1/8 + 1/8$ | $1/5 + 1/5$ | $1/7 + 1/7$ | $2/8 + 1/8$ | $1/7 + 1/7$ | $1/8 + 2/8$ |
| $1/3 - 1/6$ | $1/5 - 1/10$ | $3/5 - 1/5$ | $1/4 - 1/8$ | $3/6 + 1/6$ | $1/6 + 3/6$ | $1/7 - 1/21$ | $4/7 - 1/7$ | $1/7 - 1/14$ | $3/8 - 2/8$ |
| $1/2 - 1/8$ | $1/7 - 1/14$ | $2/5 - 1/5$ | $1/4 + 2/4$ | $4/5 + 1/5$ | $1/2 + 1/2$ | $1/4 + 2/4$ | $5/8 - 2/8$ | $1/3 - 1/6$ | $5/12 - 1/6$ |
| $2/8 + 1/8$ | $1/8 + 1/8$ | $1/6 + 3/6$ | $1/6 + 5/6$ | $1/4 + 3/4$ | $2/4 + 2/4$ | $4/5 + 1/5$ | $3/6 + 1/6$ | $1/7 + 1/7$ | $1/5 + 1/5$ |
| $1/7 + 1/7$ | $2/5 + 2/5$ | $3/6 + 3/6$ | $4/6 + 2/6$ | $3/5 + 2/5$ | $2/4 + 2/4$ | $1/4 + 3/4$ | $1/6 + 5/6$ | $2/6 + 2/6$ | $1/8 + 2/8$ |
| $2/6 + 2/6$ | $2/5 + 3/5$ | $7/8 + 2/8$ | $4/7 + 5/7$ | $2/6 + 4/6$ | $3/6 + 3/6$ | $6/8 + 1/2$ | $3/4 + 11/16$ | $3/6 + 3/6$ | $2/5 + 2/5$ |
| $1/6 + 1/6$ | $3/6 + 3/6$ | $1/2 + 2/3$ | $5/8 + 3/4$ | $1/5 + 4/5$ | $1/6 + 5/6$ | $4/5 + 3/10$ | $5/6 + 2/3$ | $2/4 + 2/4$ | $2/8 + 1/8$ |
| $1/5 + 1/5$ | $3/5 + 2/5$ | $1/6 + 5/6$ | $1/2 + 1/2$ | $3/6 + 3/6$ | $4/5 + 1/5$ | $2/3 + 1/3$ | $3/4 + 1/4$ | $3/5 + 2/5$ | $1/8 + 2/8$ |
| $2/8 + 1/8$ | $11/6 - 5/6$ | $6/4 - 2/4$ | $9/5 - 1/5$ | $2/8 + 1/4$ | $1/6 + 2/6$ | $7/5 - 2/5$ | $5/3 - 2/3$ | $9/6 - 3/6$ | $2/8 + 1/8$ |
| $1/5 + 1/5$ | $2/5 + 3/5$ | $2/5 + 3/5$ | $1/2 + 1/2$ | $2/8 + 2/8$ | $2/5 + 1/10$ | $4/5 + 1/5$ | $3/6 + 3/6$ | $2/4 + 2/4$ | $1/7 + 1/7$ |

**Colour Key:**

| Less than half | One-half | More than half | One-whole | More than one |
|---|---|---|---|---|
| Blue | Brown | Purple | Pink | Green |