# Vision Empower & XRCVC Teacher Instruction KIT Fractions and Decimals

Syllabus: Karnataka State Board Subject: Mathematics Grade: 4 Textbook Name: Mathematics Text cum Workbook Chapter Number & Name: 9. Fractions and Decimals

## **1. OVERVIEW**

## **1.1 OBJECTIVE & PREREQUISITES**

## Objective

Students will be able to

- Know the meaning of fraction
- Identify numerator and denominator of a fraction
- Find equivalent fractions for given fractions
- Know the meaning of the decimals 0.1, 0.2, 0.3

#### **Prerequisite Concept**

• Multiplication, fractional numbers *TIK\_MATH\_G3\_CH5\_Multiplication, TIK\_MATH\_G3\_CH8\_Fractional numbers* 

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Kindly Note: Activities marked with \* are mandatory

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## 2. LEARN

## **2.1 KEY POINTS**

- Fraction: A fraction represents part of a whole. When something is broken up into several equal parts, the fraction shows how many of those parts you have.
  - Example: <sup>1</sup>/<sub>2</sub>
  - Here this represents, the whole part is divided into two equal parts and out of which you have taken one part. And, 1 is in the numerator and 2 is in the denominator.
- Equivalent fraction: Equivalent fractions can be defined as fractions with different numerators and denominators that represent the same value or proportion of the whole.
- Decimal number: decimals can be considered as fractions whose denominators are 10, 100, 1000, etc. The numbers expressed in the decimal form are called decimal numbers or decimals.
  - For example: 5.1, 4.09, 13.83, etc.
- A decimal has two parts: Whole number part and Decimal part. These parts are separated by a dot ( . ) called the decimal point.

2.2 LEARN MORE

## **3. ENGAGE**

**3.1 INTEREST GENERATION ACTIVITY** 

## Fraction Introduction

Activity 1: Introducing fractions Materials Required: Newspaper

Prerequisites: None

## Activity Flow

- Distribute the newspaper to each group.
- Ask them to put the newspaper on the floor and tell them to stand on it.
- Then ask them to fold the paper into half then tell them to stand on it.
- Again ask them to fold the folded paper and to stand on it.
- Ask the students to tell what they did in the activity.
- Ask them what happened each time when they fold the paper.
  - The size of the paper gets smaller each time.
- Explain the fractional part of the paper in each step.

## 3.2 CONCEPT INTRODUCTION ACTIVITIES

## **Meaning of fraction**

## Activity 2: Meaning of fraction.

*Materials Required:* Tactile graph sheet, Bindi, paper cups and marbles. *Prerequisites:* None

## Activity Flow

Tactile fraction sheet - draw a table with 4 columns

- Divide the students into groups of 3 or 4. Distribute 10 paper cups to each group.
- Ask the students to arrange three paper cups one after another on the table. Ask them to fill the 2 paper cups with sand/ marbles.
- Discuss the following questions:
  - Totally, how many paper cups are on the table. Answer is 3.
  - How many of them are filled? Answer is 2.
  - Therefore the fractional representation of filled cups =  $\frac{2}{3}$  (out of 3 cups, 2 cups are filled, it can be written as  $\frac{2}{3}$ .
- I.e. The top number, which is the numerator shows the number of paper cups have been filled out of 3 paper cups which is the bottom number in the fraction called as the denominator. Also, the same fraction is read as 3 divided by 9.

- Similarly, ask the students to place 5 cups and to fill the 3 cups. Ask the fractional representation of the filled cups.
- The tactile fraction sheet of the table can be created by the students using tactile graph sheets and bindis. I.e. ask them to mark or consider 3 cross 3 tables with 9 small squares in it. Then ask them to put only 4 bindis on the table. Now ask them how many squares have been filled with bindis out of how many total numbers of squares. Answers would be  $\frac{4}{9}$  written in fraction form.
- After that then build the concept of the fraction with some more real examples, such as follows.
  - 1. Lakshmi has a cake of 8 equal pieces and one of her friends Soma ate 3 pieces. That means he ate three-eighths of it. I.e.  $\frac{3}{8}$ .
  - 2. Vijay has a biscuit pack of 14 equal pieces and he gave six fourteen of it to his friend. That means, he gave 6 biscuits to his friend out of 14 biscuits. I.e.  $\frac{6}{14}$ .

Another example would be dairy milk chocolate. It's already divided into parts. Hence, a fraction represents part of a whole. When something is broken up into a number of parts, the fraction shows how many of those parts you have.

## Identify the numerator and denominator

## Activity 3: Identify the numerator and denominator.

*Materials Required:* A4 sheet, Egg cartons, plastic balls, blunt scissors. *Prerequisites:* Fractions

## Activity Flow

Note: As we have discussed above, any fraction will have a numerator and denominator.

For example  $\frac{5}{8}$ , here 5 is the numerator and 8 is the denominator.

## Introducing halves and quarters:

- Give a sheet of paper (A4) to the children. Ask the children to hold the sheet on their palms; their thumb should touch the breath (shorter side) of the paper. Ask the children to fold the paper into two halves using hand over hand technique. The breadth of the two sides has to meet each other (Folding the paper vertically). Now ask them to cut the sheet into two halves by tracing the folded line. Assist the children to cut the fractional representation of each part.
  - Whole sheet is divided into two parts, It can be written as  $\frac{1}{2} + \frac{1}{2}$ .

- Fractional representation of each part is  $\frac{1}{2}$ .
- Now ask the students to take one half of the paper. Ask them to fold it again into two equal halves (using the above technique). And cut the paper into two equal halves. Repeat the same with the other half of the sheet. They will get 4 equal pieces.
  - Now discuss the fractional representation of each part.
  - $0 \quad \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$
  - They divided the whole sheet into four equal halves. so each half represents  $\frac{1}{4}$ .

Identification of numerator and denominator:

Note: Assist the students to cut the paper into eight equal pieces.

• Give them an A4 sheet of paper and to cut the sheet into 8 equal pieces. Then ask them to take 5 pieces to make a flower from the total. Then ask them how many pieces are

used to make flowers out of how many pieces. It is written as  $\frac{5}{9}$  (five by eight).

- Similarly, ask them to do it with more numbers of pieces and write them in fractions form.
- Then, ask them to represent fractions using egg cartons and balls. Also, ask them to explain.
  - Example: Given a fraction is  $\frac{4}{8}$  then they have to consider only 8 empty holes in

an egg carton sheet out of which they have to fill 4 holes with balls, where each hole will have one ball.

• Also, ask them to show the following fractions by using egg boxes and plastic balls.

 $\circ \quad \frac{1}{2}$   $\circ \quad \frac{3}{4}$   $\circ \quad \frac{2}{6}$   $\circ \quad \frac{7}{9}$   $\circ \quad \frac{5}{11}$ 

## Equivalent fractions

#### Activity 4: Equivalent fractions.

*Materials Required:* A4 sheet. *Prerequisites:* Fractions

#### Activity Flow

• Explain the following concept to the students using the below example.

## Example:

- Sita had brought 3 chapatis for her lunch. Then at lunch time Lakhmi and Vijay also joined Sita for lunch. Because Lakshmi and Vijay didn't get their lunch box. And Sita thought all three of them could share one chapati each.
- Sita made two equal parts of her chapati and out of 2 equal parts, she ate 1 part. That means she ate 2/4.
- Lakshmi made 4 equal parts of her chapati and out of 4 equal parts, she ate 2 parts. That means she ate 2/4.
- Vijay made 8 equal parts of his chapati and out of 8 equal parts, he ate 4 parts. That means he ate 4/8.
- Then they wanted to see how much they have finished in the whole chapati. So they started arranging the remaining pieces into its original form which is a circle.
- Hence Sita had only a half chapati, then Lakshmi after joining her remaining two pieces of chapati she also came to know that even she ate only half of the chapati. Then Vijay also did the same after joining his remaining 4 pieces. He also saw that it was half of the whole chapati and he also said he has eaten exactly half chapati.
- Hence, we can see that fractions such as 1/2, 2/4, 2/4 each represent half of the whole. These are called equal fractions.
- Make groups of three children and give A4 sheets to each of them. And ask them to demonstrate the story told, in the beginning, thinking that A4 sheet is a chapati.
- Later ask them to observe that if we divide the fraction 2/4 by 2 in the numerator as well as the denominator will get 1/2 as its simplest form, similarly, 4/8 will get 2/4 then again divide it by 2 will get 1/2.

## Find the equivalent fractions

Activity 5: Find the equivalent fractions.

Materials Required: A4 Sheet, blunt scissors. Prerequisites: Fractions

## Activity Flow

To find equivalent fractions, we have to multiply the numerator and the denominator by the same number.

Example:

- $\circ \quad 1/2 = 1/2 \times 2/2 = 2/4$
- $\circ \quad 1/2 = 1/2 \times 4/4 = 4/8$
- *Give two A4 sheets to each student.*

- Take one A4 sheet and cut into two equal halves or fold the paper into two equal halves. (Refer activity 3 to cut the paper into two equal halves)
- Take the second sheet and cut into 4 equal halves or fold the paper into four equal halves. (Refer activity 3 to cut the paper into 4 equal halves).
- Now ask the children to take one piece of  $\frac{1}{2}$  and tell them to place two  $\frac{1}{4}$  on top of it.
  - Discuss them that 1/2 = 2/4
  - The size of 1/2 is equal to two 1/4.
- Tell them that they can also find the equivalent fractions by multiplying the numerator and the denominator by the same number.

## **Concept of decimals**

## Activity 6: Concept of decimals.

*Materials Required:* Tactile graph sheet, bindis, tactile diagram of an enlarged image of 1 centimetre of a ruler having 10 small lines between every centimetre, Geometry kit, Parchment paper.

Prerequisites: Fractions

## Activity Flow

- Ask the students to consider three rows of 10 small squares.
- Let them put one bindi in the first row of 10 small squares where one-tenth of it is filled, two "bindi" in the second row of 10 small squares two-tenths of it is filled and similarly, 3 bindis in the third row of 10 small squares so three-tenths of it is filled.
- Ask them to represent it into fractions. Then let them think how 1/10 related to 0.1, 2/10 related to 0.2 and 3/10 related to 0.3.
- To express a number in decimal, the whole part must be divided into ten equal parts.
- On the number line between 0 and 1, there are 10 equal parts.
- Ask them to draw a line on a parchment sheet and mark 10 points with equal distance between each point.
- And explain to them that the starting point of the line is zero then the first point is onetenth of the line which is 0.1 in decimal form, the second point is two-tenth of the line which is 0.2 in decimal form and so on similarly, the tenth point will be 1.0 in the decimal form which is 1.
- Also, show them the tactile diagram of the ruler having 10 small lines in between every centimetre. Also, show them the tactile ruler and explain to them that in between every centimetre there is a small mark representing the half centimetre which is 0.5 cm.
- But still, if we can extend the line and mark 5 points after the tenth point. Then the eleventh point in the decimal form will be 1.1, twelfth point in the decimal form will be 1.2 and so on.

- Similarly, ask them to draw a line having 20 points and let them explain the decimal form of each point.
- Then ask them how fraction is related to decimals and vice versa.
- For example:
  - fraction 1/10 is 0.1 in decimal denotes that 1 part considered out of 10
  - $\circ$  fraction 5/10 is 0.5 in decimal denotes that 5 parts considered out of 10
  - $\circ$  fraction 2/100 is 0.02 in decimal denotes that 2 parts considered out of 100
  - $\circ$  fraction 11/100 is 0.11 in decimal denotes that 11 part considered out of 100
- Ask them to solve the exercises in the book.

## Remember:

- In a number, if there is a decimal point, it is called a decimal number.
- Decimal is another form of expressing fractions.
- Decimal means the denominator in the fraction is 10, 100, 1000 and so on.

3.3 LET'S DISCUSS: RELATE TO DAILY LIFE\*

In daily life, we use fractions in many situations. Most commonly, we all use fractions in the kitchen. We use fractions when buying vegetables/fruits. Ask the students how the fraction plays the role in their daily life and share a few examples with them. Examples:

- Cook  $\frac{1}{2}$  cup of rice for 2 people.
- Cutting the cake into 8 equal pieces.
- Sharing a bar of chocolate with friends.
- Slicing the pizza into 4 equal pieces.

# 4. EXERCISES & REINFORCEMENT

## 4.1 EXERCISES & REINFORCEMENT

## Practice and Recall

## Activity 7: Practice and Recall

*Materials Required:* Egg Cartons and plastic balls. *Prerequisites:* Fractions.

## Activity Flow

Note: Similar to activity 3.

• Ask the students to show the following fractions using egg cartons and plastic balls.

 $\begin{array}{c} \circ & \frac{1}{4} \\ \circ & \frac{1}{4} \end{array}$ 

 $\circ \quad \frac{3}{4}$  $\circ \quad \frac{2}{3}$ 

# Exercises

## Activity 8: Exercises

*Materials Required:* None *Prerequisites:* Fraction and decimals

#### Activity Flow

- 1. Fill in the blanks with the equivalent fractions.
  - *a.* 3/8, 6/16,\_\_\_
  - *b.* 1/5, \_\_, 3/15
  - *c.* 2/3, 4/16,\_\_\_

## 2. Write two equivalent fractions for the given fractions:

- a.  $\frac{1}{4}$ b.  $\frac{1}{3}$
- 3. Read the next decimals given below and write them in words.
  - a. 0.2
  - b. 0.5
  - *c.* 0.7
  - d. 0.21
  - e. 0.02
  - f. 0.15
- 4. Write the decimals given below.
  - a. Zero point three
  - b. Zero point six
  - c. Zero point seven
  - d. Zero point four
  - e. Zero point zero five
- 5. Write next fractions in decimals.
  - *a.* 1/10
  - *b.* 2/10
  - *c.* 5/100

#### **4.2 IMPORTANT GUIDELINES\***

#### **Exercise Reading**

It is very important that the children practice their learnings as well as their reading. Hence have the children read out the newly learned concepts from their textbooks or other available resources.

#### **Perform Textbook Activity**

It is good practice to have the children perform the textbook activities. Your textbook activities might not be accessible hence go through this resource to learn how to make textbook content accessible

#### **Provide Homework**

To evaluate their understanding and to help the student revise and implement the new learnt concept ensure to provide them with homework. Students should perform one or two of the questions mentioned above or from the textbook exercises with the teacher in Class and the remaining may be given for homework. Also, ensure that the student knows their special skills linked to independently using their accessible books as it will be critical to doing homework independently

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