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Master Lesson Plan

for

02 - Fraction and decimal numbers (ଭଗ୍ନ ସଂଖ୍ୟା ଓ ଦଶମିକ ସଂଖ୍ୟା)

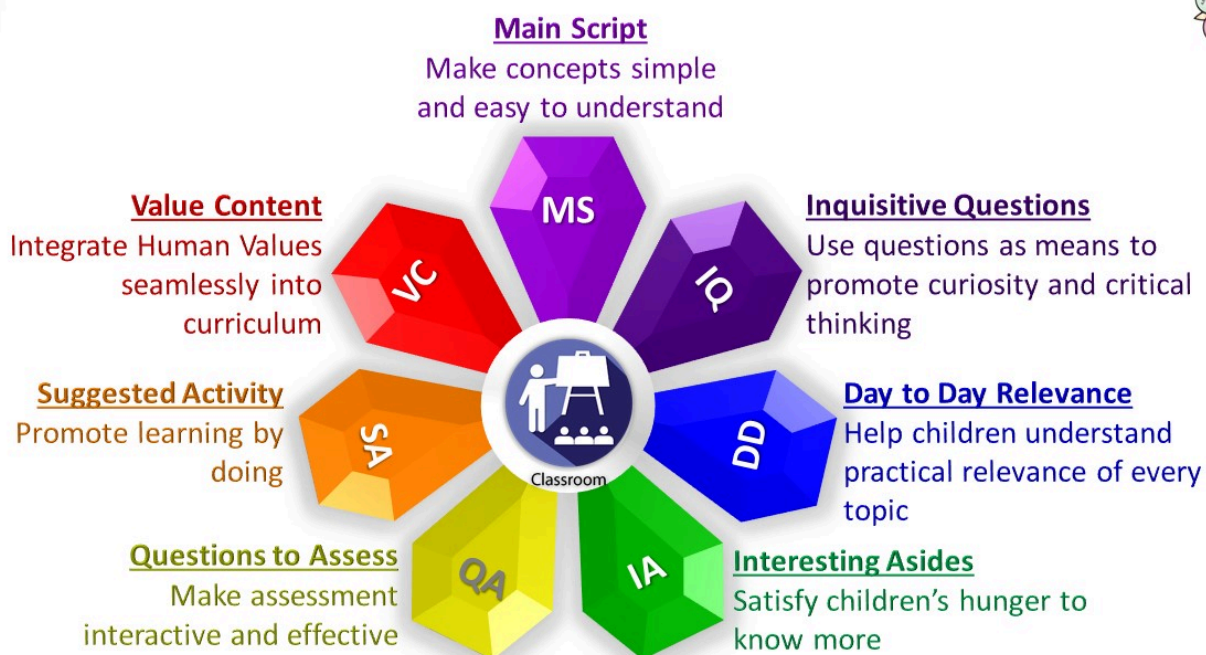
Board	Standard	Subject	Chapter	Language	Creation date
Odisha (English)	STD VII	Mathematics	02 - Fraction and decimal numbers (ଭଗ୍ନ ସଂଖ୍ୟା ଓ ଦଶମିକ ସଂଖ୍ୟା)	English	26-03-2024 22:32:39

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Master Lesson Plan (MLP) - Covers the entire chapter with the help of these 7 asset types



For more information on how to use the lesson plan effectively, please scroll to the guidelines at the end of this document.

MS_Objectives_Fractions and Decimals

Notes to the teacher:

This asset lays down the proposed plan for transacting this chapter

It states the asset objectives of the MLP. This asset is for teacher's reference and need not be taught to the students

Students will be able to:

1. Appreciate interesting facts on fractions
2. Recognise value of love and tolerance in order to succeed as a team.
3. Explain multiplication of a fraction by a whole number with suitable examples.
4. Explain fractions as an operator 'of' with suitable examples.
5. Formulate the product of two fractions
6. Solve problems based on multiplication of fractions.
7. Explain the division of fractions with suitable illustrations.
8. Solve problems based on division of fractions.
9. List the applications of decimals in daily life.
10. Explain the multiplication of decimal numbers with suitable examples.
11. Explain multiplication of decimals by 10,100 and 1000 with suitable illustrations.
12. Explain division of decimals by 10,100 and 1000 with suitable illustrations.
13. Explain the division of decimal numbers with suitable examples.
14. Solve problems involving conversion of units.
15. Analyse problem based on multiplication and division of decimal numbers.

Time to teach	Asset type	Theme	Sub Theme
3 minutes	Main Script	Fractions	Division of Fractions

IQ_Shopping Puzzle

Shopping puzzle

Ravi went for shopping and the bill for his purchases is given below

S.No	Items	Price per Unit	No. of units	Amount
1	Potatoes	Rs.15/kg	3.5kg	_____
2	Tomatoes	Rs.30/kg	_____kg	Rs.75
3	Ribbon	Rs.12/m	2.5m	_____
4	Biscuits	Rs.36.25/packet	3 packets	_____
5	Tooth Paste	Rs.104.75 for twin packets	2 twin packets	_____
6	Shampoo	Rs.112.50/bottle	_____	Rs.225
Total Amount =				Rs.700.75

Q 1) Fill in the blanks and check the total.

Q 2) If Ravi paid Rs.1000 to the shopkeeper, how much money was returned to him?

Solution

Q 1) The blanks are filled as shown below.

S.No	Items	Price per Unit	No. of units	Amount
1	Potatoes	Rs.15/kg	3.5kg	Rs.52.50
2	Tomatoes	Rs.30/kg	2.5kg	Rs.75
3	Ribbon	Rs.12/m	2.5m	Rs.30
4	Biscuits	Rs.36.25/packet	3 packets	Rs.108.75
5	Tooth Paste	Rs.104.75 for twin packets	2 twin packets	Rs.209.50
6	Shampoo	Rs.112.50/bottle	2 bottles	Rs.225
Total Amount =				Rs.700.75

1) Amount spent on potatoes = $15 \times 3.5 = \text{Rs.}52.50$

2) Quantity of tomatoes purchased = $75/30 = 5/2 = 2.5 \text{ kg}$

3) Amount spent on ribbon = $12 \times 2.5 = \text{Rs.}30$

4) Amount spent on biscuits = $36.25 \times 3 = \text{Rs.}108.75$

5) Amount spent on toothpaste = $104.75 \times 2 = \text{Rs.}209.50$

6) Number of shampoo bottles purchased = $225/112.50 = 2$

Total amount = $52.50 + 75 + 30 + 108.75 + 209.50 + 225 = \text{Rs } 700.75$

Q 2) Amount paid to shopkeeper = Rs.1000.

Amount returned to Ravi = $1000 - 700.75 = \text{Rs.}299.25$

Amount returned = Rs.299.25

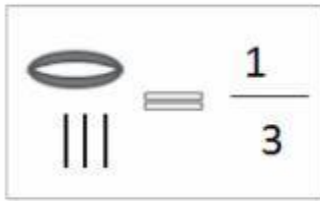
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Time to teach	Asset type	Theme	Sub Theme
10 minutes	Inquisitive Questions	Decimals	Division of a Decimal number

IA_Egyptian Fractions

Around 3000 BC, Egyptians introduced an interesting way of representing fractions. Egyptians had notations to represent fractions such as $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \dots$ etc.

Notation for $\frac{1}{3}$

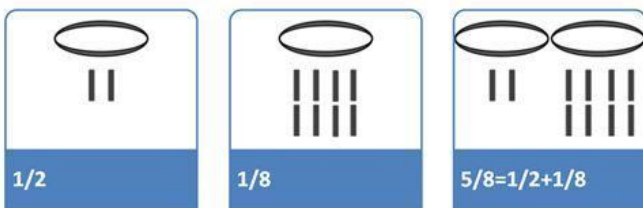


These fractions with numerator as 1 and any denominator, say 'n' were called unit fractions. However, they did not have any notation for fractions such as $\frac{5}{8}, \frac{6}{7}, \dots$ etc. They wrote such fractions as a sum of unit fractions. Shown below are two fractions $\frac{6}{7}$ and $\frac{5}{8}$ written as a sum of unit fractions.

For example,

$$\frac{6}{7} = \frac{1}{2} + \frac{1}{3} + \frac{1}{42}$$

$$\frac{5}{8} = \frac{1}{2} + \frac{1}{8}$$



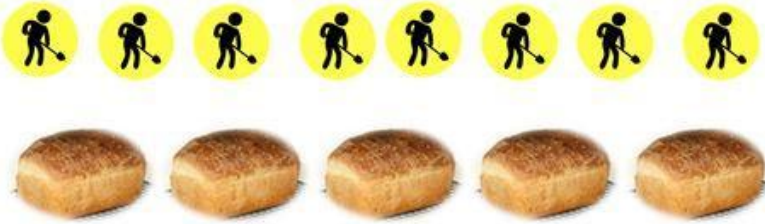
Observe that in the unit fractions $\frac{1}{2}, \frac{1}{3}, \frac{1}{42}, \frac{1}{8}, \dots$ etc, the denominator is distinct. No two unit fractions have the same denominator.

Thus, Egyptians could write a fraction as a finite sum of distinct unit fractions.

A practical use of Egyptian Fractions

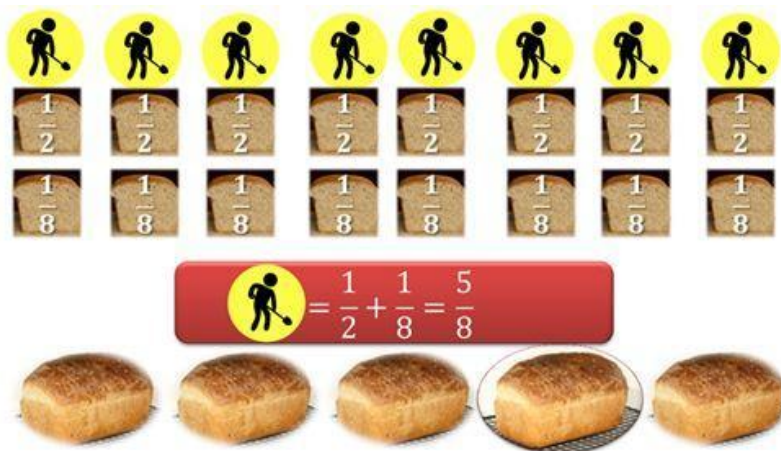
Egyptians used this concept of fractions for dividing number of objects into equal share amongst people.

Suppose an Egyptian wanted to share 5 loaves of bread among 8 workers, who helped dig his fields and clear the irrigation channels.



He first took 4 loaves and gave $\frac{1}{2}$ of a loaf to each of the 8 workers.

Next, he was left with 1 complete loaf, which was then split into 8 equal parts. Each got $\frac{1}{8}$ of the loaf. Thus, he could successfully divide 5 loaves of bread equally amongst 8 workers.



Thus, each got one half part ($\frac{1}{2}$ a loaf) and one eighth part ($\frac{1}{8}$ of a loaf). That equals to $\frac{1}{2} + \frac{1}{8} = \frac{5}{8}$.

Worker: <https://pixabay.com/illustrations/figure-stick-man-worker-work-area-2685410/>

Bread : <https://www.flickr.com/photos/photofarmer/3065021991> by [Dwight Sipler](#)

Bread loaf: <https://www.flickr.com/photos/teuobk/2104039823> by [Jeff Keacher](#)

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Time to teach	Asset type	Theme	Sub Theme
4 minutes	Interesting Asides	Fractions	Fractional Numbers

MS_Multiplication of a fraction by a whole number

Introduction

Consider the multiplication of two numbers.

We know that multiplication is actually repeated addition.

$$5 \times 3 = 3 + 3 + 3 + 3 + 3 = 15$$

$$3 \times 7 = 7 + 7 + 7 = 21$$

The same rule holds good for multiplication of a fraction by a whole number.

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

Writing the multiplication as an addition, we get

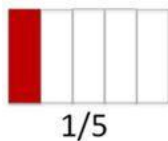
$$3 \times \frac{1}{5} = \frac{1}{5} + \frac{1}{5} + \frac{1}{5}$$

Adding the like fractions we get,

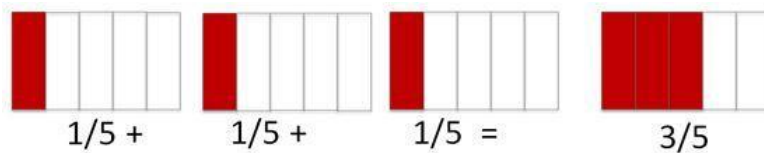
$$3 \times \frac{1}{5} = (1+1+1)/5 = \frac{3}{5}$$

Pictorial Verification

Consider the fraction $\frac{1}{5}$ represented by one fourth of a rectangle.



Repeated addition of $\frac{1}{5}$ three times would result in

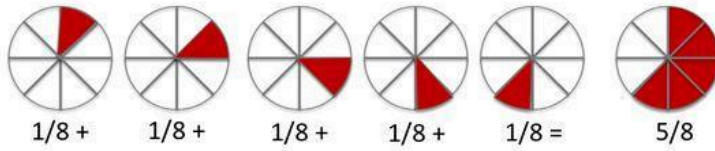


Thus, the result of the repeated addition of $\frac{1}{5}$ three times is $\frac{3}{5}$.

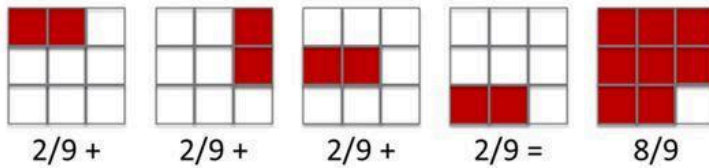
Mathematically,

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

Examples



$$5 \times \frac{1}{8} = \frac{5}{8}$$



$$4 \times \frac{2}{9} = \frac{8}{9}$$

Multiplication formula

From the above examples it is clear that -

In order to multiply a whole number with a proper or improper fraction, we multiply the whole number with the numerator of the fraction and retain the same denominator.

Whole number $\times$ fraction = Whole number $\times$ (Numerator/Denominator)

Whole number $\times$ fraction = (Whole number $\times$ Numerator)/Denominator

$$8 \times \frac{2}{3} = (8 \times 2) / 3 = 16/3 = (8 \times \text{numerator}) / 3$$

Note

In case of multiplication of a mixed fraction with a whole number, we first convert the mixed fraction into an improper fraction and then multiply.

Illustrations

Multiplication of whole number and proper fraction

$$1) 8 \times \frac{5}{47} = (8 \times 5)/47 = 40/47$$

$$2) 9 \times \frac{7}{8} = (9 \times 7)/8 = 63/8$$

Multiplication of whole number and improper fraction

$$1) 4 \times \frac{5}{3} = (4 \times 5)/3 = 20/3$$

$$2) 6 \times \frac{21}{11} = (6 \times 21)/11 = 126/11$$

Multiplication of whole number and mixed fraction

$$1) 4 \times 2\frac{1}{3} = 4 \times \frac{7}{3} = (4 \times 7)/3 = 28/3$$

$$2) 7 \times 1\frac{1}{5} = 7 \times \frac{6}{5} = (7 \times 6)/5 = 42/5$$

Image Source: vaibhavviews@gmail.com

Time to teach	Asset type	Theme	Sub Theme
13 minutes	Main Script	Fractions	Multiplication of Fractions

MS_Fractions as an operator 'of'

Fractions as an Operator 'of'

Introduction

We know that,

Twice of 5 is 10 i.e. $2 \times 5 = 10$

Thrice of 6 is 18 i.e. $3 \times 6 = 18$

Hence, 'of' means 'multiplication'.

We are familiar with the mathematical operators such as +, -, $\times$, etc. A fraction also works as an operator combining the operations of multiplication and division.

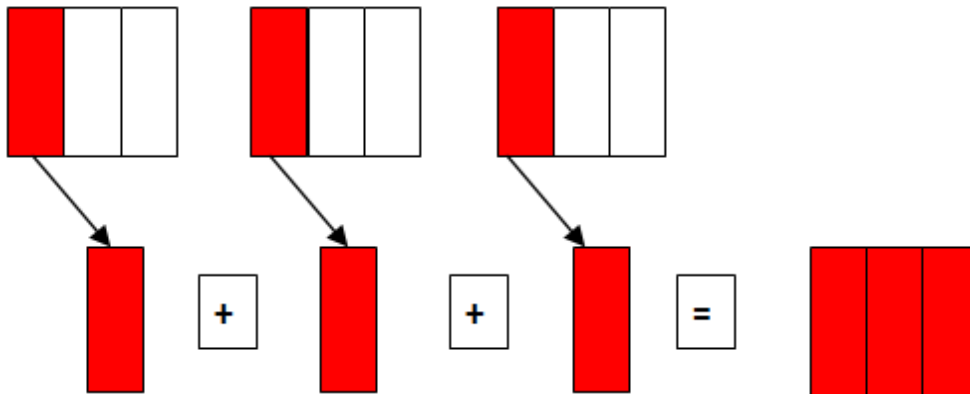
Example

$1/8^{\text{th}}$ of a pizza means a whole pizza is divided into 8 equal slices

$3/8^{\text{th}}$ of a pizza means dividing a pizza into 8 slices i.e. $1/8$ and then taking 3 of these slices i.e. 3 parts of $1/8 = 3 \times 1/8 = 3/8$.

Pictorial Explanation

Look at the following figures. Each shaded portion represents $1/3^{\text{rd}}$ of 1 rectangle.



Now adding each of the shaded areas give one complete rectangle.

Mathematically,

$$\begin{aligned} 1/3^{\text{rd}} \text{ of } 1^{\text{st}} \text{ rectangle} + 1/3^{\text{rd}} \text{ of } 2^{\text{nd}} \text{ rectangle} + 1/3^{\text{rd}} \text{ of } 3^{\text{rd}} \text{ rectangle} &= 1/3^{\text{rd}} \text{ of } 3 \text{ rectangles} \\ &= 1/3 \times 3 \\ &= 1 \text{ rectangle} \end{aligned}$$

$1/3$ of 3 is 1

$$1/3 \times 3 = 1$$

Thus, when a fraction of an amount is required, the fraction acts as an operator on the amount.

In case of $1/3^{\text{rd}}$ of 3

- The fraction $1/3$ acts on 3 through the operation of multiplication and division.
- Hence, the fraction $1/3$ acts as an operator.

• $1 / 3 \times 3 = (1 \times 3) / 3 = 3 / 3 = 1$

The original amount is multiplied by the numerator and then divided by the denominator. Note: the multiplication and division can be calculated in either order.

Illustrations

1) Two-third of passengers at a train station are waiting for a train to Delhi. If there are 150 passengers at the station, how many are waiting for the train to Delhi?

Solution:

$$\begin{aligned} 2/3 \text{ of } 150 &= 2/3 \times 150 = (2 \times 150)/3 \\ &= 300/3 \\ &= 100 \end{aligned}$$

100 passengers are waiting for the train to Delhi

2) Mohan spent $\frac{1}{2}$ of his income for household expenditure and $\frac{1}{4}$ th of his income for education, $\frac{1}{6}$ th for saving. The balance amount is spent for other things. If his income is Rs.30,000, how much has he spent for each?

Solution

$$\text{Household expenditure} = 1/2 \times 30,000 = 15,000$$

$$\text{Savings} = 1/6 \times 30,000 = 5000$$

$$\text{Education} = 1/4 \times 30,000 = 7500$$

$$\text{Expenditure} = 15,000 + 5000 + 7500 = 27500$$

$$\text{Balance} = 30,000 - 27500 = 2500$$

Thus, Amount spent for other things = Rs.2500.

Original Contribution by - sailakshmi1973@gmail.com

Time to teach	Asset type	Theme	Sub Theme
11 minutes	Main Script	Fractions	Multiplication of Fractions

SA_Activity on multiplication of two fractions

Activity on Multiplication of two fractions

Aim: To find the product of two fractions by area model method

Material required: A 4 size paper(2 per student), color pencils/crayons, Observation sheet, pen

Setting of activity: Indoor

Type of activity: Demonstration by teacher, Experiment by students, Individual activity

Instruction to teacher

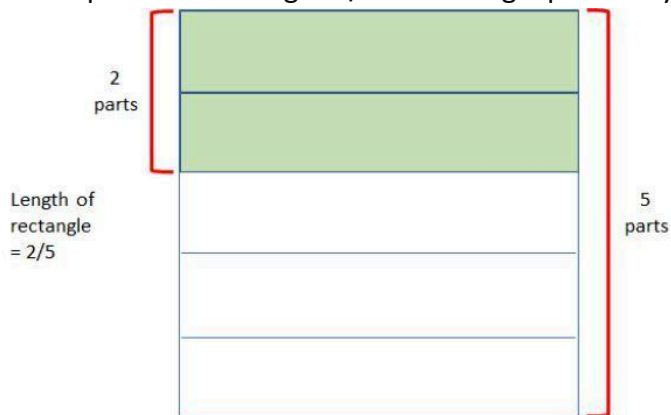
- 1) Teacher should prepare required number of copies of observation sheets (attached at the end of the document) prior to the day of the activity or can draw the columns on board for the students to copy in their notebooks.
- 2) Teacher should inform the students to bring two A 4 size sheets on the day of the activity.
- 2) Teacher can demonstrate the activity as given in the procedure.
- 3) Teacher could ask the students to find the product with two other examples(shown in observation).

Procedure:

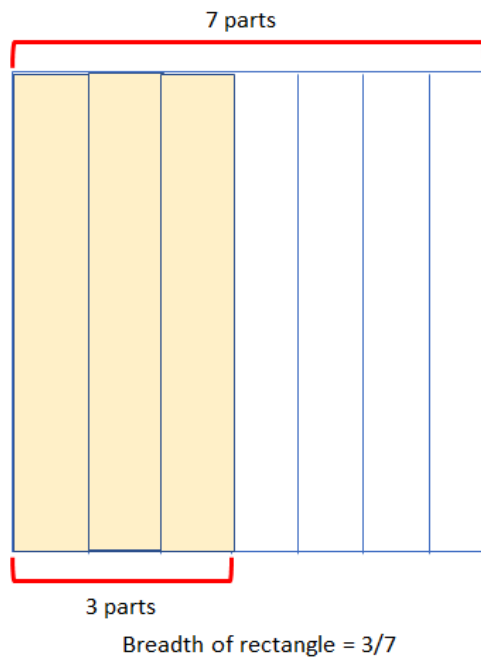
Teacher explains the area model method of multiplying two fractions.

Suppose we need to find the product of two fractions say $2/5 \times 3/7$

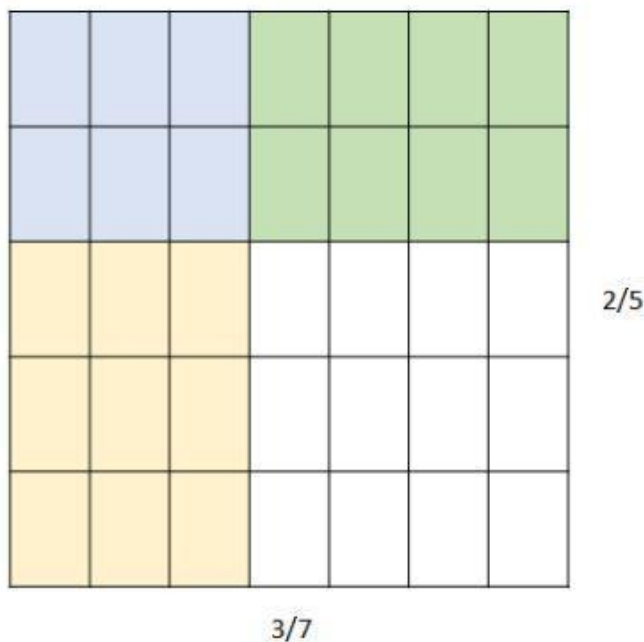
- We know that area of a rectangle is a product of its length and breadth.
- Hence the product of two factors $2/5 \times 3/7$ can be obtained by finding the area of a rectangle whose length is $2/5$ and breadth is $3/7$.
- Represent the length $2/5$ of rectangle pictorially as shown below



- Represent the breadth $3/7$ of the rectangle pictorially as shown below



- Area of the rectangle is given by $\frac{2}{5} \times \frac{3}{7}$. Representing the length and breadth of the rectangle pictorially we get



Note the length and breadth of the rectangle represent the factors and the double shaded area represents the product of the factors.

Double shaded area is a fraction of the whole rectangle (Note :multiplication of any two proper fractions results in a lower fraction)and is given by the number of double shaded parts

in the rectangle by the total number of parts in the rectangle.

Area of rectangle = $l \times b$

= $2/5 \times 3/7$

= Double shaded parts / Total number of parts

= $6/35$

Demonstration of activity: To find $3/4 \times 5/8$

Step 1 Take a rectangular A 4 sheet of paper .

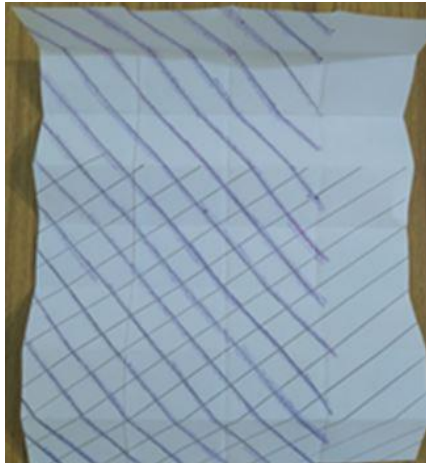


Step 2: To represent factor $3/4$, fold the paper horizontally into 4 equal parts and make thick crease. Shade 3 parts out of the 4 parts.



The above represents the rectangle with length $\frac{3}{4}$.

Step 3: To represent factor $\frac{5}{8}$, fold the paper vertically into 8 equal parts and make thick crease. Shade 5 parts out of the 8 parts.



Step 4: To find product $\frac{3}{4} \times \frac{5}{8}$, count the number of double shaded parts in the rectangle.

Double shaded parts=15

Count the total number of parts in the rectangle.

Total parts in rectangle=32

Product of factors=Double shaded parts/Total parts of rectangle.

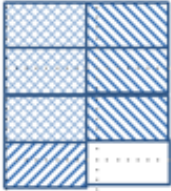
$\frac{3}{4} \times \frac{5}{8} = \frac{15}{32}$

Step 5: Fill in the observation table.

Observation

The following observation sheet is filled. The demonstration example is also entered.

Sl. No	Example	Pictorial Representation	Product of factors = Double shaded parts Total parts of rectangle
1	$\frac{3}{4} \times \frac{5}{8}$		$\frac{15}{32}$

Sl. No	Example	Pictorial Representation	Product of factors = Double shaded parts Total parts of rectangle
2	$\frac{2}{4} \times \frac{1}{2}$		$\frac{2}{8}$
3	$\frac{1}{2} \times \frac{3}{4}$		$\frac{3}{8}$

The product of two fractions is obtained .

Conclusion

The product of two fractions is obtained by area model method.

Discussions

The product of $\frac{3}{4} \times \frac{5}{8} = \frac{15}{32}$ (pictorially)

Q 1) What is the relationship between the numerators of the fractions and the numerator of the result obtained? Explain.

Expected Answer: The product of the numerators of the two fractions gives the numerator of the result.

$$3 \times 5 = 15$$

Q 2) What is the relationship between the denominators of the fractions and the denominator of the result obtained? Explain.

Expected Answer: The product of the denominators of the two fractions gives the denominator of the result.

$$4 \times 8 = 32$$

Q 3) Write a formula for product of two fractions.

Expected Answer:

Product of two fractions = Product of numerators / Product of denominators

$$\frac{3}{4} \times \frac{5}{8} = \frac{(3 \times 5)}{(4 \times 8)} = \frac{15}{32}$$

Observation Sheet:

Observation Sheet			
	Examples	Pictorial Representation	Product of fraction = <u>Double Shaded Parts</u> Total Parts
1			
2			
3			

Image source: Original by sailakshmi1973@gmail.com

Observation Sheet: Original by vallisairam9@gmail.com

Time to teach	Asset type	Theme	Sub Theme
20 minutes	Suggested Activity	Fractions	Multiplication of Fractions

QA_Assessment on Multiplication of fractions

4. Multiply and reduce to lowest from:

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

5. Which is greater?

$$\frac{2}{5} \text{ of } \frac{1}{5} \text{ or } \frac{3}{5} \text{ of } \frac{5}{6}$$

6. Find

i) $\frac{3}{4}$ of a year

ii) $\frac{2}{5}$ of a rupee

iii) $\frac{1}{3}$ of a day

iv) $\frac{1}{4}$ of a hour

7. Priyanka has 24 apples. $\frac{3}{4}$ of these are found to be rotten. Find the number of rotten apples.

8. A rectangular park is $21\frac{3}{7}$ m long and $12\frac{3}{5}$ m wide. What is the area of the park?

9. Rohit covers $2\frac{2}{5}$ km in one hour. How much distance will he cover in $3\frac{1}{3}$ hours?

10. There are 48 students in a class and $\frac{2}{3}$ of them are boys. How many girls are there in the class?

Answers

1) $9 \times \frac{2}{5}$

$$9 \times \frac{2}{5} = \frac{18}{5} = 3\frac{3}{5}$$

2) $10 \times 6\frac{1}{4}$

$$10 \times \frac{25}{4} = 5 \times \frac{25}{2} \text{ (reducing to lower fraction)}$$

$$= \frac{125}{2} = 62\frac{1}{2}$$

3) $\frac{1}{2}$ of $3\frac{2}{9}$

$$\frac{1}{2} \times 3\frac{2}{9} = \frac{1}{2} \times \frac{29}{9} = \frac{1 \times 29}{2 \times 9} = \frac{29}{18}$$

4) $\frac{3}{5} \times \frac{5}{6}$

$$\frac{3}{5} \times \frac{5}{6} = \frac{3 \times 5}{5 \times 6} = \frac{3}{6} = \frac{1}{2}$$

5) $\frac{2}{5}$ of $\frac{1}{5}$

$$\frac{2}{5} \times \frac{1}{5} = \frac{2 \times 1}{5 \times 5} = \frac{2}{25}$$

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

$$\frac{3}{5} \times \frac{5}{6} = \frac{3 \times 5}{5 \times 6} = \frac{3}{6} = \frac{1}{2}$$

$$\frac{2}{25} < \frac{1}{2}$$

$\frac{3}{5}$ of $\frac{5}{6}$ is greater

6) i) $\frac{3}{4}$ of a year

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

ii) $\frac{2}{5}$ of a rupee

$$\frac{2}{5} \times 100 = 2 \times 20 = 40 \text{ paise}$$

iii) $\frac{1}{3}$ of a day

$$\frac{1}{3} \times 24 = 1 \times 8 = 8 \text{ hours}$$

iv) $\frac{1}{4}$ of a hour

$$\frac{1}{4} \times 60 = 1 \times 15 = 15 \text{ mins}$$

$$7) \frac{3}{4} \text{ th of } 24 = \frac{3}{4} \times 24 = 3 \times 6 = 18$$

18 apples are rotten.

8) Area of park = length x breadth

$$= 21\frac{3}{7} \times 12\frac{3}{5}$$

$$= 150/7 \times 63/5 = 30 \times 9 = 270 \text{ sq.m}$$

Area of park is 270sq.m

$$9) \text{ Distance covered in 1 hour} = 2\frac{2}{5} \text{ Km}$$

$$\text{Distance covered in } 3\frac{1}{3} \text{ hours} = 2\frac{2}{5} \times 3\frac{1}{3}$$

$$= 12/5 \times 10/3 = 4 \times 2 = 8 \text{ Km.}$$

Rohit covers 8Km in $3\frac{1}{3}$ hours.

$$10) \text{ Number of boys} = 2/3 \text{ of } 48 = 2/3 \times 48 = 2 \times 16 = 32$$

$$\text{Number of girls} = 48 - 32 = 16$$

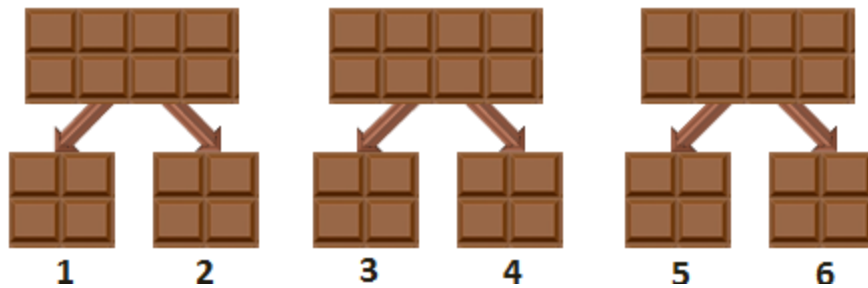
Number of girls in the class is 16.

Time to teach	Asset type	Theme	Sub Theme
20 minutes	Questions to Assess	Fractions	Multiplication of Fractions

MS_Division of fractions

Introduction

Consider 3 bars of chocolates. It is decided to make $\frac{1}{2}$ portions of each bar and distribute amongst friends. The number of such portions we can obtain would be 6.



Mathematically,
 $3 \div \frac{1}{2} = 6$

Division of whole number by a fraction

Number of $\frac{1}{3}$ s in a square

The square is divided into 3 equal parts.



Each part is $\frac{1}{3}$.

From the above figure,

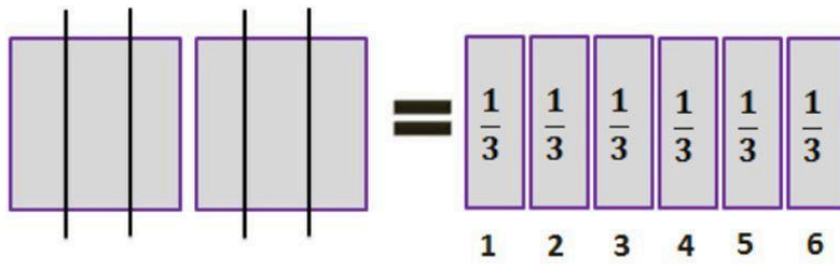
Number of $\frac{1}{3}$ s in a square = 3.

Mathematically,

$$1 \div \left(\frac{1}{3}\right) = 3$$

Number of $\frac{1}{3}$ s in two squares

Consider two squares.



Each square is divided into 3 equal portions such that each portion is $\frac{1}{3}$.

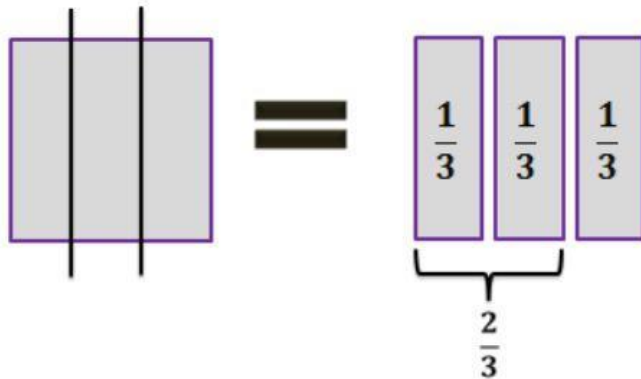
Observe that the number of $\frac{1}{3}$ rd portions obtained is 6.

Mathematically we can write,

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

Number of $\frac{2}{3}$ s in two squares

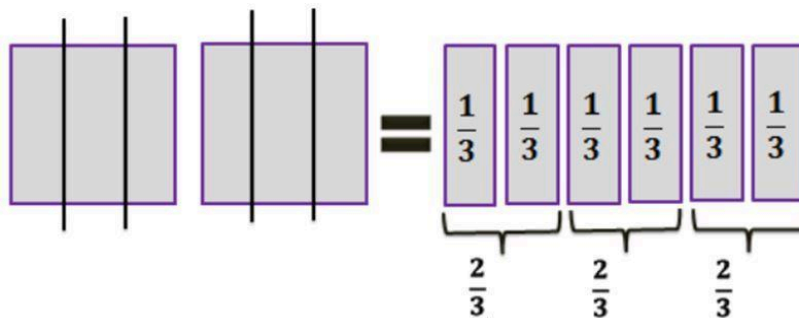
Consider a square



Divide the square into 3 equal portions such that each portion is $\frac{1}{3}$.

$\frac{2}{3}$ of the square is represented by two portions taken together.

Consider two squares placed adjacent to each other



Observe that there are three $\frac{2}{3}$ portions in the two squares taken together.

Mathematically,

$$2 \div \frac{2}{3} = 3$$

Mathematical formula

We know that

$$2 \div \frac{2}{3} = 3$$

Observe that,

$$2 \times \frac{3}{2} = 3$$

Hence we may write

$$2 \div \frac{2}{3} = 2 \times \frac{3}{2} = (2 \times 3) / 2 = 6 / 2 = 3$$

Similarly we may obtain

$$5 \div \frac{2}{7} = 5 \times \frac{7}{2} = \frac{35}{2}$$

$$3 \div \frac{1}{4} = 3 \times \frac{4}{1} = 12$$

$$6 \div \frac{2}{5} = 6 \times \frac{5}{2} = \frac{30}{2} = 15$$

Division of a whole number by a fraction is same as multiplication of the whole number and its inverted fraction. Inverted means the numerator becomes denominator and vice versa.

Reciprocal of a fraction

If we interchange the numerator and denominator of a fraction, then we get the reciprocal of the fraction.

$\frac{3}{2}$ is the reciprocal of $\frac{2}{3}$

$\frac{7}{8}$ is the reciprocal of $\frac{8}{7}$

$\frac{1}{5}$ is the reciprocal of 5 as 5 can be written as $\frac{5}{1}$

Whole number $\div$ fraction = Whole number $\times$ Reciprocal of the fraction.

Example:

Find $5 \div (\frac{2}{7})$

Solution:

$$5 \div (\frac{2}{7}) = 5 \times (\frac{7}{2}) = 5 \times \frac{7}{2} = \frac{35}{2}$$

So, we conclude, when a whole number is to be divided by a fraction, the whole number may be multiplied by reciprocal of the fraction.

Division of whole number by a mixed fraction

Steps to divide a whole number by a mixed fraction:

Step 1: Convert a mixed fraction into improper fraction

Step 2: Divide whole number by the improper fraction

Example 1: Find $2 \div 3\frac{1}{5}$

Solution :

$$2 \div 3\frac{1}{5} = 2 \div \frac{16}{5} = 2 \times (\frac{5}{16}) = 2 \times \frac{5}{16} = \frac{10}{16} = \frac{5}{8}$$

Division of a fraction by another fraction

There are 3 simple steps to divide a fraction by another fraction

Step 1. Convert mixed fraction into improper fraction if there is any

Step 2: Find the reciprocal of the 2nd fraction

Step 3. Multiply the 1st fraction and the reciprocal of the 2nd fraction.

ILLUSTRATIONS

Example 1: Find $\frac{2}{7} \div 8$

Step 1: Reciprocal of $8 = 1/8$

Therefore, we have

$$\frac{2}{7} \times \frac{1}{8} = \frac{2}{56} = \frac{1}{28}$$

Example 2: Find $3/8 \div 2/9$

Step 1: Reciprocal of $2/9 = 9/2$

Step 2: Product of Fraction and Reciprocal $= 3/8 \times 9/2 = 3 \times 9 / 8 \times 2 = 27 / 16$

i.e. $3/8 \div 2/9 = 27/16$

Example 3: Find $3/8 \div 2\frac{1}{7}$

Step 1: Convert $2\frac{1}{7}$ into improper fraction: $2\frac{1}{7} = 15/7$

Step 2: Reciprocal of $15/7 = 7/15$

Step 3: Product of fraction and reciprocal $= 3/8 \times 7/15 = 3 \times 7 / 8 \times 15 = 7 / 40$

i.e. $3/8 \div 2\frac{1}{7} = 7/40$

Example 4: Find $3\frac{2}{5} \div 1\frac{3}{8}$

Step 1: Convert $3\frac{2}{5}$ and $1\frac{3}{8}$ into improper fraction: $3\frac{2}{5} = 17/5$ and $1\frac{3}{8} = 11/8$

Step 2: Reciprocal of $11/8 = 8/11$

Step 3: Product of fraction and reciprocal $= 17/5 \times 8/11 = 136/55$

Example 5 : Sneha has a piece of wood $\frac{3}{4}$ ft in length. She needs to cut pieces that are $1/16$ ft in length. How many pieces will she get?

Solution: Length of full piece of wood $= \frac{3}{4}$ ft

length of each small piece $= 1/16$ ft

Number of pieces $= \frac{3}{4} \div 1/16$

$$= \frac{3}{4} \times \frac{16}{1}$$

$$= 12 \text{ pieces}$$

Sneha will get 12 pieces.

Source of image

Chocolate bar <https://pixabay.com/illustrations/bar-chocolate-default-background-1736191/>

Time to teach	Asset type	Theme	Sub Theme
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20 minutes	Main Script	Fractions	Division of Fractions
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QA_Assessment on Division of fractions

Assessment on Division of fractions

1. Divide

i) $\frac{14}{9}$ by 7

ii) 24 by $\frac{8}{3}$

2. Evaluate :

i) $3\frac{3}{5} \div 2\frac{2}{5}$ ii) $\frac{4}{9} \div \frac{5}{6}$

3. Write down the reciprocal of each of the following fractions:

i) $\frac{1}{13}$

ii) 9

iii) $12\frac{2}{5}$

4. The cost of $4\frac{1}{4}$ kg of sugar is ₹68. Find the cost of 1 kg.

5. Find a number such that its two-fifths is 12.

6. The product of two numbers is $\frac{16}{9}$. If one of the numbers is $\frac{5}{2}$, find the other number.

7. If the cost of a notebook is $6\frac{1}{3}$, how many notebooks can be purchased for $126\frac{2}{3}$?

8. By what number should $10\frac{2}{3}$ be divided to obtain 20?

Answers

1) i) $\frac{14}{9}$ by 7

$$14/9 \div 7$$

$$=14/9 \times 1/7$$

$$=2/9$$

ii) 24 by $\frac{8}{3}$

$$24 \div 8/3$$

$$=24 \times 3/8$$

$$=9$$

2) i) $3\frac{3}{5} \div 2\frac{2}{5}$

$$18/5 \div 12/5$$

$$=18/5 \times 5/12$$

$$=3/2$$

ii) $\frac{4}{9} \div \frac{5}{6}$

$$4/9 \times 6/5$$

$$=8/15$$

3) i) $13/1=13$

ii) $1/9$

iii) $12\frac{2}{5}$

$$=62/5$$

$$\text{Reciprocal of } 62/5 = 5/62$$

4) The cost of $4\frac{1}{4}$ kg of sugar is `68.

$$\text{Cost of 1 Kg of sugar} = 68 \div 4\frac{1}{4} = 68 \div 17/4 = 68 \times 4 / 17 = 16$$

5) Number is two-fifths of 12.

$$2/5 \times \text{Number} = 12$$

$$\text{Number} = 12 \div 2/5 = 12 \times 5/2 = 30$$

6) The product of two numbers is $\frac{16}{9}$. One of the numbers is $\frac{5}{2}$.

Let other number be A.

$$A \times \frac{5}{2} = \frac{16}{9}$$

$$A = \frac{16}{9} \div \frac{5}{2} = \frac{16}{9} \times \frac{2}{5} = \frac{32}{45}$$

7) The cost of a notebook is $6\frac{1}{3}$.

$$\text{Amount available for purchase} = 126\frac{2}{3}$$

$$\text{Number of notebooks that can be purchased} = 126\frac{2}{3} \div 6\frac{1}{3}$$

$$= \frac{380}{3} \div \frac{19}{3}$$

$$= 20$$

20 notebooks can be purchased.

8) Let the number be G.

$$10\frac{2}{3} \div G = 20$$

$$\frac{32}{3} \times \frac{1}{G} = 20$$

$$G = \frac{32}{3} \times \frac{1}{20}$$

$$= \frac{8}{15}$$

Time to teach	Asset type	Theme	Sub Theme
18 minutes	Questions to Assess	Fractions	Division of Fractions

MS_Multiplication of decimal numbers

Multiplication of decimal numbers

Introduction

The following situation can be given to understand the need for multiplication of a whole number and a decimal number.

A pencil costs Rs. 7.50. In order to buy 8 pencils we need to determine the cost of 8 pencils.

Method 1: By addition method

Cost of 8 pencils will be

$$7.50+7.50+7.50+7.50+7.50+7.50+7.50+7.50=60.00$$

That is adding 7.50 eight times.

Method 2: By multiplication method

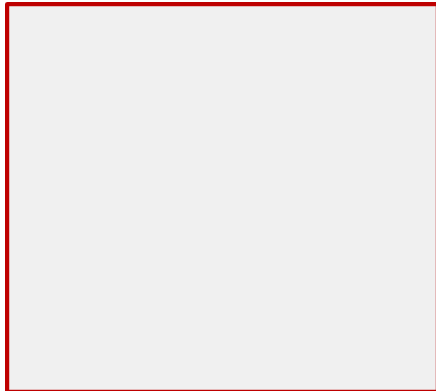
You know that multiplication is repeated addition. So, instead of adding 7.50, eight times, it is easy to multiply 7.50 by 8.

Cost of 8 pencils will be R.s $7.50 \times 8=60$

Multiplication of decimals-Pictorial representation

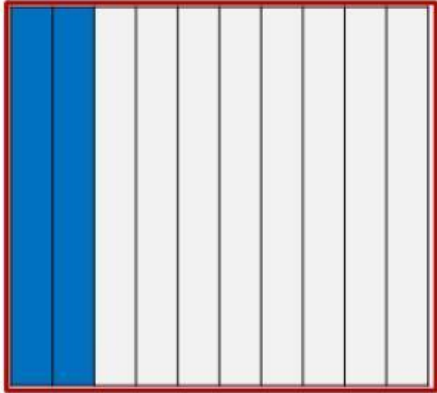
Let's see the pictorial representation of 0.4×0.2

This is a whole.

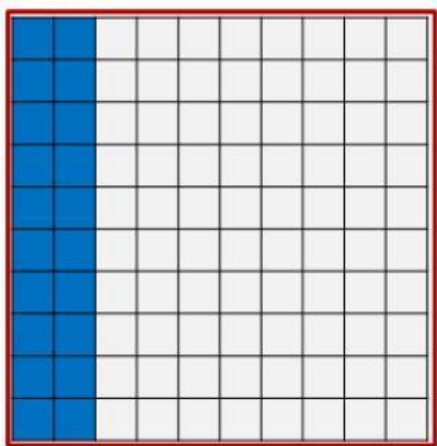


Consider $2/10$ of the whole. So, divide the whole into 10 equal parts and 2 parts denote $2/10 = 0.2$

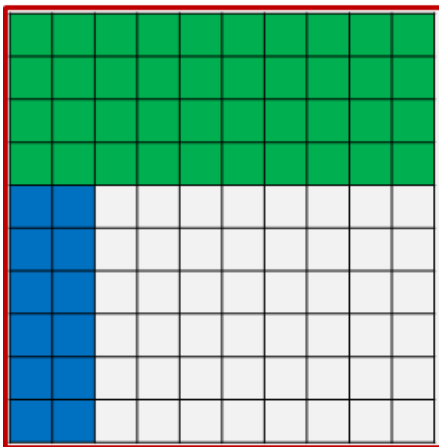
The shaded area denotes 0.2



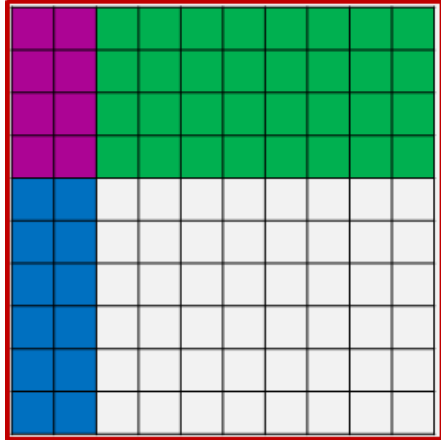
Again divide the above rectangle into 10 equal parts horizontally. Observe the figure. Each square is $\frac{1}{10}$ of $\frac{1}{10} = \frac{1}{10} \times \frac{1}{10} = \frac{1}{100}$. i.e one part of 100.



To represent 0.4, choose 4 horizontal parts of the whole.



There are 8 squares on which the blue and green shades overlap.



The pink region containing 12 squares represent 12/100 of 100.

Since each square is $\frac{1}{100}$, 12 squares represents

$$12 \times \left(\frac{1}{100}\right) = \frac{12}{100} = 0.12$$

$$0.4 \times 0.2 = 0.08$$

Pictorial representation will not help us always. It takes time.

Steps of finding the product of decimals.

Step 1: Ignore the decimal point and multiply decimal numbers as whole numbers

Step 2: Add the number of digits to the right of the decimal point in the decimal numbers that are to be multiplied. Let the number of digits be n .

Step 3: In the product, count n digits starting from the rightmost digit and moved towards left. Then place the decimal point. If there are not enough digits, then add zeros before the product.

Example 1: Find 21.4×0.2

Step 1: find $214 \times 2 = 428$

Step 2: No. of digits to the right of decimal number $21.4 = 1$

No. of digits to the right of decimal number $0.2 = 1$

No. of digits to the right of the two decimal numbers $= 1+1=2$

Step 3: In the product, count 2 digits from the rightmost to left. Then we come at



Put the decimal point before 2. Hence, the product is 4.28

Example 2: Find 1.4×0.3

Step 1: find $14 \times 3 = 42$

Step 2: No. of digits to the right of decimal number $1.4 = 1$

No. of digits to the right of decimal number $0.3 = 1$

No. of digits to the right of the two decimal numbers $= 1+1=2$

Step 3: In the product, count 2 digits from the rightmost to left. Then we come at



Put the decimal point before 4. Hence, the product is 0.42

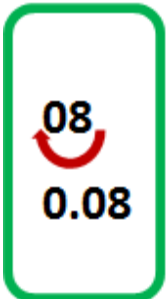
Example 3: Find 0.2×0.4

Step 1: find $2 \times 4 = 8$

Step 2: No. of digits to the right of decimal numbers $= 2$.

Step 3: The product is a single digit number 8. Hence, we cannot count 2 digits from the right to left.

Add one zero before 8 and place the decimal point.



The product is 0.08

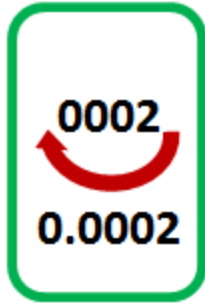
Example 4: Find 0.02×0.01

Step 1: find $2 \times 1 = 2$

Step 2: No. of digits to the right of decimal numbers $= 4$.

Step 3: The product is a single digit number 2. Hence, we cannot count 4 digits from the right to left.

Add three zero before 2 and place the decimal point.



The product is 0.0002

Example-5

Pradeep purchased 2.8 Kg of tomatoes at Rs. 27.50 per kilo. Find the purchase amount.

Applying the rules of multiplication we get,

Purchase amount= $27.5 \times 2.8=77.00$

Purchase amount is Rs.77.

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Time to teach	Asset type	Theme	Sub Theme
15 minutes	Main Script	Decimals	Multiplication of a Decimal number

DD_Applications of decimals in daily life

Applications of decimals in daily life

Many activities of our daily life involves the application of decimals.

1) Measurement of weight on the electronic scale is always displayed in decimals.



Ram's weight is 45.4 Kg.

Ravi purchased 1.25 Kg of Tomatoes.

2) Temperature reading on the thermometer is displayed in decimals.



Normal body temperature is 98.6 degree F.

In case of fever, body temperature could be 100.4 degree F.

3) Money transactions involve application of decimals.



Mohan paid the bill amount of Rs. 769.50 at the shop.

4) Quantity of petrol and the corresponding price is displayed in the petrol bunk in decimals.



One litre of petrol costs Rs. 75.

Ravi filled 2.67 litres of petrol and paid an amount of Rs. 200.25

5) Examination results are displayed as decimal percentages.

Name	Eng	Sanskrit	Hindi	Maths	Science	Social	Total	Percentage
Anil Sai	82.5	92.5	79	99	95	93.5	541.5	90.25
Bharat	77.5	90	73.5	90	92	89	512.09	84.35
Pranav	94.3	95.5	92.5	97.5	96.4	95	571.2	95.2
Tushar	65	77	80	85	82	86	475	79.1
Sai Krishna	96	97.5	97	100	97	98.5	590	98.3
Vindu	83.5	89.5	72	67	75	81	468	78
Aravind	88	91	94.5	96	79.5	80.5	529.5	88.25
Aravind	93	87	78.5	90.5	65	79.5	493.5	82

School topper scored 98.3% in board exam

Second topper scored 95.2%

6)The electronic meter reading for finding the consumption of electricity is displayed in decimals.In an autorickshaw, the cost for the ride is displayed on the electronic meter in decimals.

Siva paid Rs. 83.75 for a ride.



Thus,we find that decimals occur as an integral part of our daily life.

IMAGES

Weight

- 1.<https://pixabay.com/illustrations/boy-teenager-teenage-boy-young-1691781/>
- 2.<https://pixabay.com/illustrations/scale-weigh-in-mass-weight-scales-1133910/>
- 3.<https://www.maxpixel.net/Kitchen-Scale-Electronic-Scales-Kitchen-Scales-2442599>
- 4.<https://pixabay.com/illustrations/tomatoes-trusses-packaging-1984285/>

Temperature

- 1.<https://pixabay.com/vectors/influenza-flu-fever-grippe-cold-156098/>
- 2.<https://pixabay.com/illustrations/thermometer-graphic-temperature-2238809/>

Bill

<https://www.flickr.com/photos/loustejskal/26591956951> by **Lou Stejskal**

Petrol pump meter

SSSVV Gallery: Fuel

Mark sheet

Original

Meter

Auto rickshaw meter

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Electricity Meter: SSSVV Gallery: Meter

Time to teach	Asset type	Theme	Sub Theme
4 minutes	Day-to-day Relevance	Decimals	Using decimals in (money, length and weight)

MS_Multiplication of decimals by 10,100,1000

Multiplication of decimals by 10,100,1000

Introduction

We know that decimals can be represented as fractions.

$$25.6 = 256 / 10$$

$$14.78 = 1478 / 100$$

Consider multiplication of a decimal number by 10, 100,1000 as shown in the table below:

$$\begin{aligned} 47.8 \times 10 &= \frac{478}{10} \times 10 = 478 \\ 16.32 \times 100 &= \frac{1632}{100} \times 100 = 1632 \\ 9.675 \times 1000 &= \frac{9675}{1000} \times 1000 = 9675 \end{aligned}$$

Observe the following-

- When the decimal number is multiplied by 10, the digits in the result are same. However, the decimal point undergoes a shift to the right by one place. Note that 10 has one zero over 1.
- When the decimal number is multiplied by 100, the digits in the result are same. However, the decimal point undergoes a shift to the right by two places. Note that 100 has two zeroes over 1.
- When the decimal number is multiplied by 1000, the digits in the result are same. However, the decimal point undergoes a shift to the right by three places. Note that 1000 has three zeroes over 1.

Rule - Multiplication of Decimal Numbers by 10

Step 1: Write the decimal number without decimal point.

Step 2: Shift the decimal point to the right by one place.

Example: Find 3.67×10 .

Number without decimal point is 367.

Shifting the decimal point to the right by one place from its original position gives

$$36.7 \text{ (3.67} \xrightarrow{\text{shift}} \text{36.7)}$$

$$3.67 \times 10 = 36.7$$

Rule-Multiplication of Decimal Numbers by 100 and 1000

For 100, we shift the decimal point to the right by 2 places and for 1000 we shift the decimal point to the right by 3 places. If digits are not enough to move, then add as many zeroes as required.

Example 1: Find 13.235×100 .

Number without decimal point is 13235.

Shifting the decimal point to the right from its original position by 2 places gives

132.5 (13.23 5-----→ 1323.5)



$13.235 \times 100 = 1323.5$

Example 2: Find 13.23×100 .

Number without decimal point is 1323.

Shifting the decimal point to the right by 2 places gives

132.5 (13.23 -----→ 1323)



$13.23 \times 100 = 1323$

Example 3: Find 13.23×1000 .

Number without decimal point is 1323.

Shift the decimal point to the right by 3 places. Since the number of digits are not enough, add one zero at the right end. We get

13230 (13.230 -----→ 13230)



$13.23 \times 1000 = 13230$

Example 4: Find 13.23×10000 .

Number without decimal point is 1323.

Shift the decimal point to the right by 4 places. Since the number of digits are not enough add two zeroes at the right end. We get

132300 (13.2300 -----→ 132300)



$13.23 \times 10000 = 132300$

Conclusion

When a decimal number is multiplied by 10, 100 or 1000, the digits in the product are same as in the decimal number but the decimal point in the product is shifted to the right by as many places as the number of zeros over one.

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Time to teach	Asset type	Theme	Sub Theme
10 minutes	Main Script	Decimals	Multiplication of a Decimal number

MS_Division of a decimal number by 10,100 and 1000

Division by of Decimal Numbers by 10, 100 and 1000

Introduction

Division is the inverse operation or opposite operation of multiplication.

In multiplication, we shift the decimal point to the right by one place, 2 places or 3 places as we multiply the decimal number by 10,100 or 1000.

Consider division of a decimal number by 10, 100,1000 as shown below:

$$\begin{aligned} 47.8 \div 10 &= 47.8 \times \frac{1}{10} = \frac{47.8}{10} = 4.78 \\ 416.32 \div 100 &= 416.32 \times \frac{1}{100} = \frac{416.32}{100} = 4.1632 \\ 8479.5 \div 1000 &= 8479.5 \times \frac{1}{1000} = \frac{8479.5}{1000} = 8.4795 \end{aligned}$$

Observe that,

- When the decimal number is divided by 10, the digits in the result are same. However, the decimal point undergoes a shift to the left by one place. Note that 10 has one zero over 1.
1. When the decimal number is divided by 100, the digits in the result are same. However, the decimal point undergoes a shift to the left by two places. Note that 100 has two zeroes over 1.
 1. When the decimal number is divided by 1000, the digits in the result are same. However, the decimal point undergoes a shift to the left by three places. Note that 1000 has three zeroes over 1.

Rule- Division of Decimal Numbers by 10

Step 1: Write the decimal number without decimal point.

Step 2: Shift the decimal point to the left by one place.

Example : Find $13.67 \div 10$

Number without decimal point is 1367.

Shifting the decimal point to the left by one place gives

$$1.367 \text{ (13.67 -----} \gg 1.367 \text{)}$$

$$13.67 \div 10 = 13.67 \times \frac{1}{10} = 1.367$$

Rule - Division of Decimal Numbers by 100 and 1000

For 100, we shift the decimal point to the left by 2 places and for 1000 we shift the decimal point to the left by 3 places. If digits are not enough to move, then add as many zeroes as required to the left end of the decimal number.

Example : Find $7.9 \div 100$

Number without decimal point is 79.

Shift the decimal point to the left by 2 places. As the number of digits in decimal number to the left is less, we add zeroes to the number at its left end. Note any number of zeroes can be added to the left end as it does not alter the value of the number.

$$0.079 \text{ (} 007.9 \text{ -----} \gg 0.079 \text{)}$$

$$7.9 \div 100 = 7.9 \times \frac{1}{100} = 0.079$$

Example : Find $45.76 \div 1000$

Number without decimal point is 4576.

Shift the decimal point to the left by 3 places. As the number of digits in decimal number to the left is less, we add zeroes to the number at its left end.

$$0.04576 \text{ (} 0045.76 \text{ -----} \gg 0.04576 \text{)}$$

$$45.76 \div 1000 = 45.76 \times \frac{1}{1000} = 0.04576$$

Example: The area of a room is 135.5 sq. ft and its width is 10 ft. Find its length.

Area = length x width

$$\text{Length of the room} = 135.5 \div 10 = 13.55 \text{ ft.}$$

Conclusion

when a decimal number is divided by 10, 100 or 1000, the digits in the product are same as in the decimal number but the decimal point in the product is shifted to the left by as many places as the number of zeroes over one.

All original contribution by sailakshmi1973@gmail.com

Time to teach	Asset type	Theme	Sub Theme
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10 minutes	Main Script	Decimals	Division of a Decimal number
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MS_Division of Decimals

Introduction

We come across the following situations often.

- Cost of 15 notebooks is Rs. 645.5. The cost of one notebook would be $645.5 \div 15$
- Area of a rectangular garden is 450.25 sq.m. The length of the garden is 20.5 m. The width of the garden would be $450.25 \div 20.5$

In order to solve these situations we need to know the method of division of decimal numbers by a whole number or by another decimal number.

Division of decimal by a whole number

Step-1 Write the decimal number as a fraction.

Step-2 Apply the rules of division of a fraction by a whole number, followed by division by 10, 100..etc as per the denominator in the fraction.

Example 1: Divide 18.5 by 5

Divide 18.5 by 5 is same as $18.5 \div 5$

Step 1	Write the decimal as a fraction	$\frac{185}{10}$
Step 2	Rewrite the division as multiplication by reciprocal	$\frac{185}{10} \times \frac{1}{5}$
Step 3	Rearrange denominators	$\frac{185}{5} \times \frac{1}{10}$
Step 4	Divide the dividend by whole number followed by division by 10	$37 \times \frac{1}{10} = \frac{37}{10}$ $= 3.7$

$$18.5 \div 5 = 3.7$$

Example 2: Divide 27.33 by 3

Divide 27.33 by 3 is same as $27.33 \div 3$

Write 27.33 as $2733/100$

Hence,

$$27.33 \div 3 = 2733/100 \div 3 = 2733/100 \times 1/3 = 2733/3 \times 1/100 = 911 \times 1/100 = 911/100 = 9.11$$

Division of a decimal number by a decimal number

Step-1: Move the decimal point in the divisor to the right until it is a whole number.

Step-2: Move the decimal point in the dividend to the right by the same number of places as the decimal point was moved to make the divisor a whole number.

Step-3: Then divide the new dividend by the new divisor.

Example 1: Divide 84.8 by 0.4

Step-1

In the divisor 0.4, the decimal point is shifted to the right by one place to get whole number 4.

Step-2

In the dividend 84.8, the decimal point is shifted to the right by one place (same as done in step-1). We get the new dividend as 848.

Step-3

$$848 \div 4 = 848 \times \frac{1}{4} = 212$$

$$\frac{84.8}{0.4} = \frac{848}{4} = 212$$

$$84.8 \div 0.4 = 848 \div 4 = 212$$

Example 2: Find $84.88 \div 0.4$

Step-1

In the divisor 0.4, the decimal point is shifted to the right by one place to get whole number 4.

Step-2

In the dividend 84.88, the decimal point is shifted to the right by one place (same as done in step-1). We get the new dividend as 848.8.

Step-3

$$848.8 \div 4 = 848.8 \times \frac{1}{4} = 8488/10 \times \frac{1}{4} = 2122/10 = 212.2$$

$$\frac{84.88}{0.4} = \frac{848.8}{4} = 212.2$$

$$84.88 \div 0.4 = 848.8 \div 4 = 212.2$$

Example 3:

A car travels 558.6 Km in 10.5 hours. Find the average speed of the car.

Average speed = Distance travelled / Time taken

$$= 558.6 / 10.5$$

$$= 5586 / 105 = 53.2 \text{ Km/hr (calculate by long division)}$$

Average speed of the car is 53.2 Km/hr.

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Time to teach	Asset type	Theme	Sub Theme
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15 minutes	Main Script	Decimals	Division of a Decimal number
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QA_Assessment on Conversion of units

Assessment on Conversion of Units

1.Fill in the blanks

- a) 1 m = _____ mm
- b) 1 kg = _____ mg
- c) 1 l = _____ ml
- d) 1 mile = _____ Km

2.Covert the following units as directed

- a. 20.90 km into cm
- b. 60 ml into litre
- c. 120.333 g into kg
- d. 5 miles into km

3. Complete the following conversions:

- a. 256 m = _____ km = _____ cm = _____ mm
- b. 3446 mg = _____ g = _____ kg
- c. 118.75 km = _____ km + _____ m
- d. 28.7 kg = _____ kg + _____ g

4. Word problem

- 1. Ruchi covers 3.25km in 50 minutes. How much distance in metres does she cover in 25 minutes ?
- 2. A bottle contains 500ml of water and the water fills half of the bottle. How many litres of water does the bottle hold?

ANSWERS

1) Fill in the blanks

- a) 1 m = 1000 mm
- b) 1 kg = 1000000 mg
- c) 1 l = 1000 ml
- d) 1 mile = 1.61 Km

2) Covert the following units as directed

- a) 20.90 km into cm
 $20.90 \text{ Km} = 20.90 \times 1000 = 20900\text{m}$
 $20900 \text{ m} = 20900 \times 100 = 2090000\text{cm}$
 $20.90 \text{ km} = 2090000 \text{ cm}$

- b) 60 ml into l

$$60 \text{ ml} = 60 \times 1 / 1000 = 60 / 1000 = 0.06 \text{ l}$$

$$60 \text{ ml} = 0.06 \text{ l}$$

c) 120.333 g into kg

$$120.333 \text{ g} = 120.333 \times 1/1000 = 0.120333 \text{ Kg}$$

$$120.333 \text{ g} = 0.120333 \text{ Kg}$$

d) 5 miles into Km

$$5 \text{ miles} = 5 \times 1.61 = 8.05 \text{ Km}$$

$$5 \text{ miles} = 8.05 \text{ Km}$$

3) Complete the following conversions:

a) $256 \text{ m} = 256 \times 1/1000 = 256/1000 = 0.256 \text{ km}$

$$256 \text{ m} = 256 \times 100 = 25600 \text{ cm}$$

$$256 \text{ m} = 256 \times 1000 = 256000 \text{ mm}$$

$$256 \text{ m} = 0.256 \text{ km} = 25600 \text{ cm} = 256000 \text{ mm}$$

b) $3446 \text{ mg} = 3446 \times 1 / 1000 = 3446 / 1000 = 3.446 \text{ g}$

$$3446 \text{ mg} = 3446 \times 1/1000000 = 3446/1000000 = 0.003446 \text{ kg}$$

$$3446 \text{ mg} = 3.446 \text{ g} = 0.003446 \text{ kg}$$

c) $118.75 \text{ km} = 118 \text{ km} + 0.75 \text{ km}$

$$0.75 \text{ km} = 0.75 \times 1000 = 750 \text{ m}$$

$$118.75 \text{ km} = 118 \text{ km} + 750 \text{ m}$$

d) $28.7 \text{ kg} = 28 \text{ kg} + 0.7 \text{ kg}$

$$0.7 \text{ kg} = 0.7 \times 1000 = 700 \text{ g}$$

$$28.7 \text{ kg} = 28 \text{ kg} + 700 \text{ g}$$

4) Word problems

1) Distance covered in 50 mins = 3.25 km

$$\text{Distance covered in 25 mins} = 3.25 / 2 \text{ km} = 1.625 \text{ km}$$

$$\text{Distance covered in 25 mins} = 1.625 \text{ km} = 1.625 \times 1000 = 1625 \text{ m}$$

Ruchi covers 1625 m in 25 mins.

2) A bottle contains 500 ml of water and the water fills half of the bottle. How many litres of water does the bottle hold?

One half of bottle = 500 ml

$$\text{One full bottle} = 500 \times 2 = 1000 \text{ ml} = 1 \text{ litre}$$

The bottle holds 1 litre of water.

Time to teach	Asset type	Theme	Sub Theme
20 minutes	Questions to Assess	Decimals	Division of a Decimal number

VC_Become a whole person

Fraction is part of a whole. Such as piece of a whole cake, one biscuit from a whole packet of biscuits, etc.

Note to the teacher: Initiate a discussion on what it means to be a whole.

Children!

1. What do we need to become whole people? Do lot of money and materials make us whole?

(Let children come out with answers).

Suggested answer: One who is physically, mentally and emotionally happy is a whole person.

2. **How can you make yourself a whole person?**

(Let children come out with answers).

Suggested answer: We can only really feel whole and complete if we have inner peace and are not disturbed by the good and bad things that happen around us.

3. **Denominators of fractions need to be same family before we can add or subtract. What does it teach you?**

(Let children come out with answers).

Suggested answer: It is only by becoming “one family” that we can work together. Fractions are like us. If we leave each as individuals, we cannot achieve anything. But if we make them become all the same family, they can work together more effectively.

So, Children! We can work together as one team to accomplish any task only if we erase our outward differences from our perspective and develop tolerance for one another.

(Concept Courtesy: Sai Sister Dr. Margaret Taplin)

Time to teach	Asset type	Value	Sub Value
3 minutes	Value Content	Love	Tolerance

MS_Summary_Fractions and Decimals

- Egyptians introduced an interesting way of representing fractions
- To perform operations of addition or subtraction on a set of fractions, we convert them into like fractions (with common denominator). Similarly to perform any task successfully as a team, we have to practice value of love and tolerance (remove individual differences)
- In order to multiply a whole number with a proper or improper fraction, we multiply the whole number with the numerator of the fraction and retain the same denominator. Example: $9 \times \frac{7}{8} = \frac{(9 \times 7)}{8} = \frac{63}{8}$
- In case of multiplication mixed fraction with a whole number, we first convert the mixed fraction into an improper fraction and then multiply. Example: $4 \times 2\frac{1}{3} = 4 \times \frac{7}{3} = \frac{(4 \times 7)}{3} = \frac{28}{3}$
- When a fraction of an amount is required, the fraction acts as an operator 'of' on the amount. Example: $\frac{1}{3}$ of 3 = $\frac{1}{3} \times 3 = 1$
- Product of two fractions is obtained by multiplying their numerators and denominators separately and writing the Product of numbers/ Product of denominators. Example: $\frac{3}{4} \times \frac{5}{8} = \frac{(3 \times 5)}{(4 \times 8)} = \frac{15}{32}$
- Division of a whole number by a fraction is same as multiplication of the whole number with the reciprocal of the fraction. Example: $6 \div \frac{2}{5} = 6 \times \frac{5}{2} = 15$
- Division of one fraction by another fraction is same as multiplication of first fraction and reciprocal of the second fraction. Example: $\frac{3}{8} \div \frac{2}{3} = \frac{3}{8} \times \frac{3}{2} = \frac{9}{16}$
- Many activities in our daily life involve the application of decimals
- In multiplication of decimal numbers, first ignore the decimal point and multiply the decimal numbers as whole numbers. Next add the number of digits to the right of the decimal point in both the decimal numbers. Let the number of digits be 'n'. In the product, count 'n' digits from the rightmost digit and move towards the left. Then place the decimal point. If there are not enough digits then add zeros before the product. Example: $0.02 \times 0.04 = 0.0008$
- When a decimal number is multiplied by 10, 100 or 1000, the digits in the product are the same as in the decimal numbers but the decimal point is shifted to the right by as many places as the number of zeros over one
Example: $3.67 \times 10 = 36.7$
 $3.67 \times 100 = 367$
 $3.67 \times 1000 = 3670$
- When a decimal number is divided by 10, 100 or 1000, the digits in the product are the same as in the decimal numbers but the decimal point is shifted to the left by as many places as the number of zeros over one
• Example: $48.79 \div 10 = 4.879$
• $48.79 \div 100 = 0.4879$
• $48.79 \div 1000 = 0.04879$
- To divide a decimal number by a whole number we first write the decimal number as a fraction. We then apply the rules of division of fraction by a whole number followed by division by 10, 100, ... etc. as per the denominator of the fraction. Example: $27.33 \div 3 = \frac{2733}{100} \times \frac{1}{3} =$

$$911/100 = 9.11$$

· To divide a decimal number by another decimal number, we move the decimal point in the divisor to the right until it is a whole number. Move the decimal point in the dividend to the right by the same number of places as the decimal point was moved to make the divisor a whole number. Then divide the new dividend by new divisor. Example: $84.8 / 0.4 = 848/4 = 212$

Time to teach	Asset type	Theme	Sub Theme
5 minutes	Main Script	Fractions	Division of Fractions

Master Lesson Plan

Seven Asset Methodology for MLP

What is the purpose of this Master lesson Plan?	This Master Lesson Plan (MLP) prepared by Sri Sathya Sai Vidya Vahini (SSSVV), covers the entire chapter for the given board. The MLP for the chapter given in the textbook is broken down into smaller modules known as assets. Any chapter can be taught using the 7 asset types in SSSVV methodology. Several different assets together complete the entire chapter. Depending on the requirement, each asset is supported by teaching aids such as animated presentation, audio, video, and learning aids such as worksheets. The MLP is for the teacher's preparation and the teaching aids are for use in the classroom.
How to use it?	You can prepare for your class with this MLP by following 3 simple steps: 1. Read your textbook; 2. Go through the information given in the assets (document & multimedia); 3. Prepare your teaching notes. Great! Now you are ready to transact the chapter.
Duration	Kindly note the duration given for each asset. Due care has been taken in planning the assets, to ensure the chapter is completed within the time specified by the Board. Note: Preparation time is not included in the asset duration. The teaching time depends on the duration of the teaching aids and is not impacted by the length of the MLP.
What is a 'Main Script' (MS) Asset?	The Main Script asset is there for explaining the main concepts of the chapter clearly. The information given in the textbook is simplified, organised and structured to give more clarity. Additionally, you may find a video or mnemonics or a graphic organiser to deepen the understanding of the concept.
How to teach using the MS asset?	Please use the blackboard, slides and interaction to develop the concept.
What is an 'Inquisitive Questions' (IQ) asset?	The Inquisitive Questions asset uses questions to promote higher order thinking like the n^{th} why, what-if, new perspectives, cause-effect, and others, creating curiosity.
How to teach using the IQ asset?	You may use the questions to connect with the students, encourage exploration to engage them in the learning process. You may allow multiple responses and instead of rejecting any of the responses, ask why, before revealing the suggested answer or hints.
What is a 'Day to day Relevance' (DD) Asset?	The Day to Day Relevance asset helps students understand the practical relevance of every topic, making them eager participants in the classroom. If students connect the concepts to their environment, they would learn meaningfully without dislike or simply memorizing for exams.

How to teach using the DD asset?	You may use the asset by asking questions about their experience and use it to establish why they are learning the topic. If necessary you may substitute with a recent or local example.
What is an 'Interesting Aside' (IA) asset?	The Interesting Aside asset uses attention grabbing titbits or anecdotes to bring joy and satisfy the child's hunger to know more. This is a quick/short asset intended to bring attention back to the main concept being taught.
How to teach using the IA asset?	You may use this asset to give a piece of interesting information relevant to the topic, without prolonged explanation/discussion. You may suggest appropriate books for further reading.
What is a 'Suggested Activity' (SA) Asset?	The Suggested Activity asset provides a detailed step by step procedure for the teacher to conduct a hands-on activity. This promotes Activity Based Learning.
How to teach using the SA asset?	You may use this asset to energise your students to learn by doing simple, fun-filled activities based on the topic. The asset includes - preparation, activity, and follow-up. You may engage the students in the preparation and follow-up stages to develop collaboration and responsibility. You could try it once, yourself, before the actual delivery to be more comfortable with it. Note: The duration mentioned in the asset is usually for the activity part only.
What is a 'Value Content' (VC) Asset?	The Value Content asset integrates Universal Human Values (such as empathy, inclusivity, respect for nature that translates into responsible behaviour) seamlessly into the curriculum, as the "End of education is character".
How to teach using the VC asset?	You may use this asset to engage with the students to bring out their innate values and connect with the intrinsic values in the topic/concept. The asset includes pointers on the specific pedagogical technique followed.
What is a 'Questions to Assess' (QA) asset?	The Questions to Assess asset uses an interactive approach to check learning of different types of learners, and provides feedback to the teacher for appropriate action. The questions cater to all the levels of Bloom's Taxonomy. Questions from 'Apply' level and above enable students to reflect on their learning.
How to teach using the QA asset?	You may go through the slides to understand its flow and know when to click for the answer (slides include suggested answers). While presenting in the class, you may display the question and encourage multiple responses, before revealing the answer. In some cases, this asset may include extra questions/worksheet that can be given as homework.