Knowing content through Reading our textbooks

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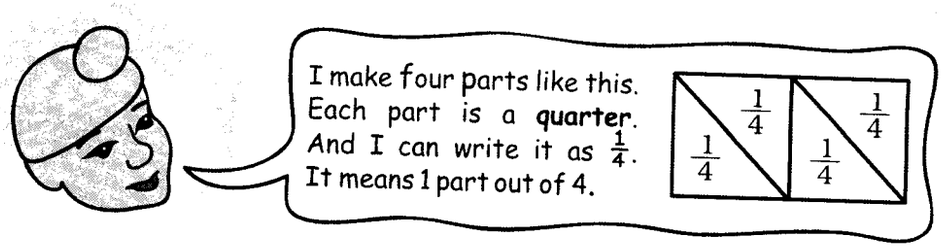
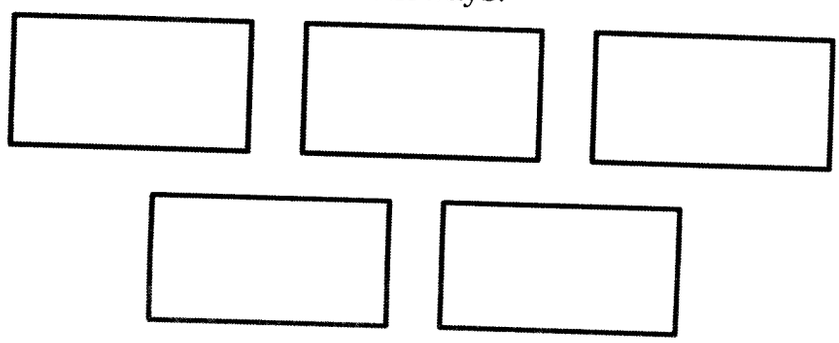
Example 1

Lets' solve the question.



- In how many different ways can you cut a rectangle into four equal parts? Draw 5 different ways.



Can you check if they are equal?

Explain the strategies that you can use to decide the four parts are equal.

Example 2

Find the answer of the following question. Explain how it works. Is there any other way to solve this problem?

An Old Woman's Will

Once there lived an old woman. She lived with her three daughters. She was quite rich and had 19 camels. One day she fell ill. The daughters called the doctor. The doctor tried his best but could not save the woman. After her death, the daughters read what she had written in her will.

My eldest daughter will get $\frac{1}{2}$ of my camels
My second daughter will get $\frac{1}{4}$ of my camels
My third daughter will get $\frac{1}{5}$ of my camels

The daughters were really puzzled. "How can I get $\frac{1}{2}$ of the 19 camels?" asked the eldest daughter.

"Half of 19 is nine and a half. But we can't cut the camel!" The second daughter said.

"That is right. But what will we do now?" asked the third daughter".

Example 3

Following game appears in our textbook, lets try to solve it.

to in the simplest form.

A fraction is said to be in the simplest (or lowest) form if its numerator and denominator have no common factor except 1.

The shortest way

The shortest way to find the equivalent fraction in the simplest form is to find the HCF of the numerator and denominator, and then divide both of them by the HCF.

A Game

The equivalent fractions given here are quite interesting. Each one of them uses all the digits from 1 to 9 once!

$$\frac{2}{6} = \frac{3}{9} = \frac{58}{174}$$

$$\frac{2}{4} = \frac{3}{6} = \frac{79}{158}$$

Try to find two more such equivalent fractions.

Is there any strategy to solve this?

Example 4

Read following paragraph..

Fraction as an operator 'of'

Observe these figures (Fig 2.6)

The two squares are exactly similar.

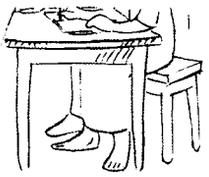
Each shaded portion represents $\frac{1}{2}$ of 1.

So, both the shaded portions together will represent $\frac{1}{2}$ of 2.

Combine the 2 shaded $\frac{1}{2}$ parts. It represents 1.

So, we say $\frac{1}{2}$ of 2 is 1. We can also get it as $\frac{1}{2} \times 2 = 1$.

Thus, $\frac{1}{2}$ of $2 = \frac{1}{2} \times 2 = 1$



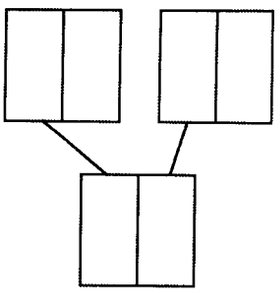


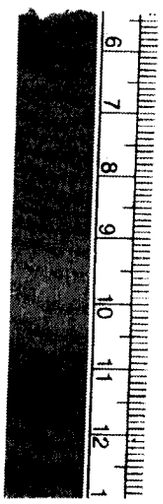
Fig 2.6

Can we represent following multiplication problem using similar representation? Let's give a try.

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

Example 5

Read following paragraph from our textbook -



7.2 A Fraction

Let us recapitulate the discussion.
A fraction means a part of a group or of a region.

$\frac{5}{12}$ is a fraction. We read it as "five-twelfths".

What does "12" stand for? It is the number of equal parts into which the whole has been divided.

What does "5" stand for? It is the number of equal parts which have been taken out.

Here 5 is called the numerator and 12 is called the denominator.

Name the numerator of $\frac{3}{7}$ and the denominator of $\frac{4}{15}$.

What is the definition of fraction ?

In Das sir's class students were asked to fill in the correct sign < or > or =, in the following problem-

$$59 \div 42 \quad \square \quad 359 \div 342$$

Ashwini said she will write the = sign because,

" *59 ÷ 42 = 1 Remainder 17*

359 ÷ 342 = 1 Remainder 17

So in both exercises the answer is same that is 1 and the remainder is 17, and that is why they are equal."

How would you respond Ashwini? Can we take any help from definition of fraction given above for the explanation?

Example 6

Anwesh solved the following problem -

$$\frac{3}{5}+\frac{4}{6}=\frac{7}{11},$$

When asked why did he added both denominator and numerator, he replied "*When I get 25 marks out of 40 in Geography and 30 marks out of 40 in History, my report card says that I have received 55 marks out of 80 in SS. I applied the same logic here. 3 out of 5 and 4 out of 6 is same as 7 out of 11*"

What will you say to Anwesh?

Read following paragraph from our textbook. Does it have any link with the question above?

9.3 What are Rational Numbers?

The word 'rational' arises from the term 'ratio'. You know that a ratio like 3:2 can also be written as $\frac{3}{2}$. Here, 3 and 2 are natural numbers.

Similarly, the ratio of two integers p and q ($q \neq 0$), i.e., $p:q$ can be written in the form $\frac{p}{q}$. This is the form in which rational numbers are expressed.

A rational number is defined as a number that can be expressed in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

Thus, $\frac{4}{5}$ is a rational number. Here, $p = 4$ and $q = 5$.

Is $\frac{-3}{4}$ also a rational number? Yes, because $p = -3$ and $q = 4$ are integers.

You have seen many fractions like $\frac{3}{8}, \frac{4}{8}, 1\frac{2}{3}$ etc. All fractions are rational numbers. Can you say why?

How about the decimal numbers like 0.5, 2.3, etc.? Each of such numbers can be written as an ordinary fraction and, hence, are rational numbers. For example, $0.5 = \frac{5}{10}$, $0.333 = \frac{333}{1000}$ etc.

Example 7

Brian was given the following problem to solve $1.6 \times 1.8 = ?$

His answer was as follows -

$$\begin{array}{r} 1.6 \\ \times\, 1.8 \\ \hline 28.8 \end{array}$$

When teacher asked him that why did you put decimal point after two places, it should be 2.88. Brian responded saying,

When I do 1.6 + 1.8 my answer is 3.4 and you said when both numbers have only one decimal place you should give only one decimal place in the answer. Also if I make my answer 2.88 it will be smaller than 3.4, which can't be as you said multiplication answer is always bigger.

How will respond to Brian?

Is the following stanza from the textbook can be used to help Brian?

2.6.1 Multiplication of Decimal Numbers by 10, 100 and 1000

Reshma observed that $2.3 = \frac{23}{10}$ whereas $2.35 = \frac{235}{100}$. Thus, she found that depending on the position of the decimal point the decimal number can be converted to a fraction with denominator 10 or 100. She wondered what would happen if a decimal number is multiplied by 10 or 100 or 1000.

Let us see if we can find a pattern of multiplying numbers by 10 or 100 or 1000.

Have a look at the table given below and fill in the blanks:

$1.76 \times 10 = \frac{176}{100} \times 10 = 17.6$	$2.35 \times 10 =$ ___	$12.356 \times 10 =$ ___
$1.76 \times 100 = \frac{176}{100} \times 100 = 176$ or 176.0	$2.35 \times 100 =$ ___	$12.356 \times 100 =$ ___
$1.76 \times 1000 = \frac{176}{100} \times 1000 = 1760$ or 1760.0	$2.35 \times 1000 =$ ___	$12.356 \times 1000 =$ ___
$0.5 \times 10 = \frac{5}{10} \times 100 = 5$; $0.5 \times 100 =$ ___ ; $0.5 \times 1000 =$ ___		

Observe the shift of the decimal point of the products in the table. Here the numbers are multiplied by 10,100 and 1000. In $1.76 \times 10 = 17.6$, the digits are same i.e., 1, 7 and 6. Do you observe this in other products also? Observe 1.76 and 17.6. To which side has