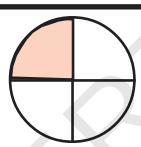
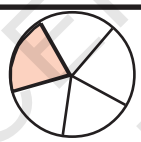
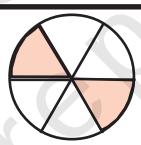
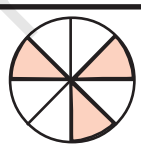
LESSON- 7

V1L9P6

FRACTIONS AND DECIMAL FRACTIONS

In the annual sports competition of Karan's school 4 teams from class V students participated in 'Alpona' competition. Each team drew a circle in the midst of the 'Alpona' and divided the circle into some equal parts. While colouring the parts of the circle, they used red colour also as one of the colours. The parts of the circle coloured in red are shown below–

First team	
Second team	
Third team	
Fourth team	

Now, let us see which team and, in how many parts coloured the circular Alpona in red!

- The first team divided the circle into 4 equal parts and coloured 1 part in red.
- The second team divided the circle into 5 equal parts and coloured 1 part in red.
- The third team divided the circle into 6 equal parts and coloured 2 parts in red.
- The fourth team divided the circle into 8 equal parts and coloured 3 parts in red.

The parts coloured by the teams in red can also be expressed as follows–

- The first team coloured $\frac{1}{4}$ part.
- The second team coloured $\frac{1}{5}$ part.
- The third team coloured $\frac{2}{6}$ part.
- The fourth team coloured $\frac{3}{8}$ part.

Let us learn from pictures

(i)  $\frac{1}{2}$

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

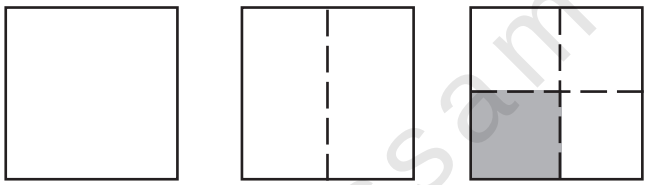
(iii)  $\frac{1}{6}$

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

Game in paper

Take a square paper sheet. Divide the sheet into two equal parts by making a fold on it. What do you get? Each part of the paper obtained by folding can be expressed as fraction. Again fold it equally in the other direction. Unfold the paper now. What have you seen?

By folding a paper sheet in this way also we can have four equal parts.

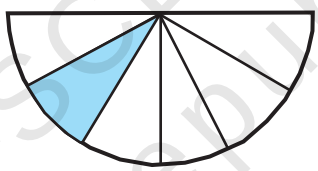


Now, when expressed in fraction, the coloured part will be $\frac{1}{4}$ part of the paper.

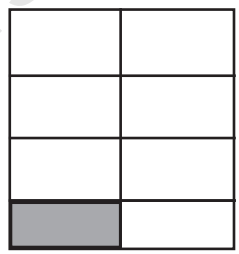
In the adjoining figure 1 part of 5 equal parts has been coloured. It is expressed as $\frac{1}{5}$

◆ **Let us look at the folds given below–**

$\frac{1}{5}$



$\frac{1}{6}$



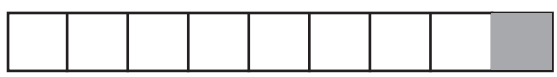
$\frac{1}{8}$

◆ **Think for a moment**, If the folds were unequal could you express the parts as $\frac{1}{5}, \frac{1}{6}, \frac{1}{8}$?

◆ **Let us write–**

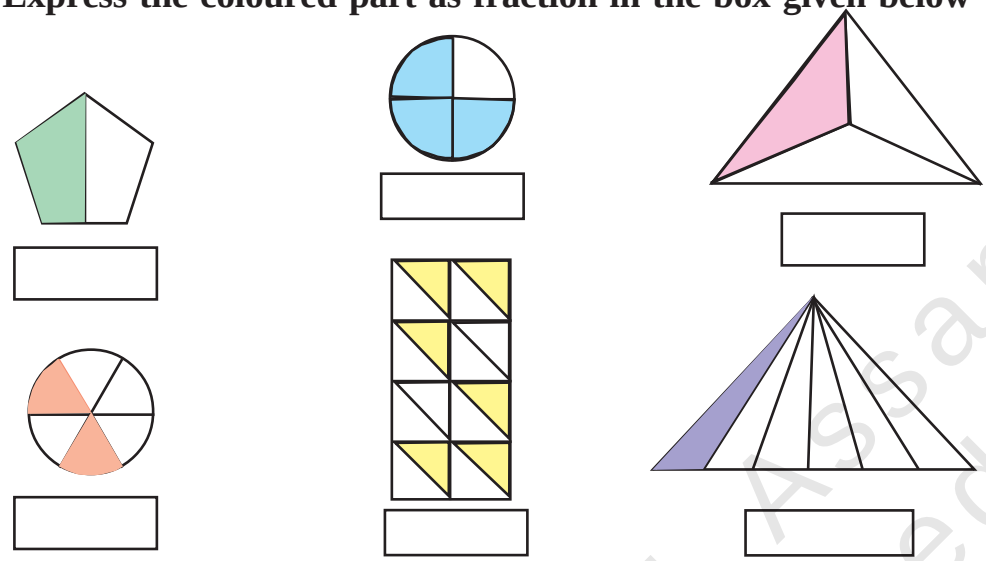
$\frac{1}{8}$ | 1 of 8 parts or one eighth |

$\frac{1}{9}$ |



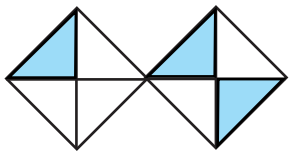
$\frac{1}{10}$ |

◆ **Express the coloured part as fraction in the box given below-**



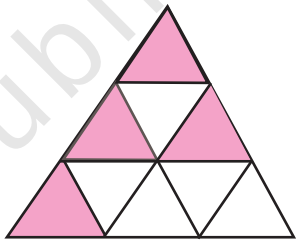
◆ **Choose the fraction that expresses the coloured part and put (√) mark.**

(1)



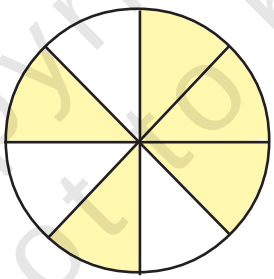
$\frac{1}{3}$	$\frac{3}{8}$ √	$\frac{4}{5}$

(2)



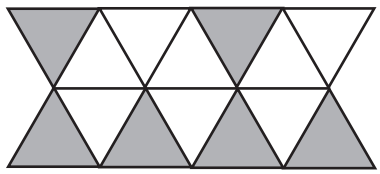
$\frac{5}{9}$	$\frac{4}{9}$	$\frac{1}{4}$

(3)



$\frac{5}{8}$	$\frac{1}{5}$	$\frac{3}{8}$

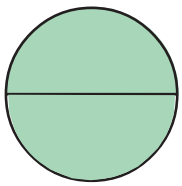
(4)



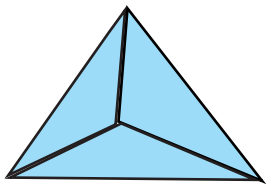
$\frac{6}{14}$	$\frac{7}{14}$	$\frac{8}{14}$

◆ **Let us see :**

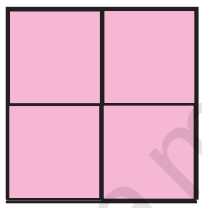
What will be the fractions for the following coloured parts?



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



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



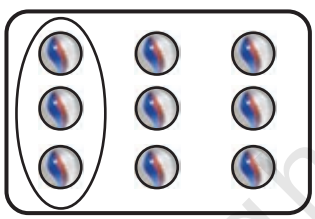
$\frac{4}{4} = 1$

$\frac{2}{2}$ = A figure is divided into 2 equal parts and the 2 parts are coloured = whole figure =1

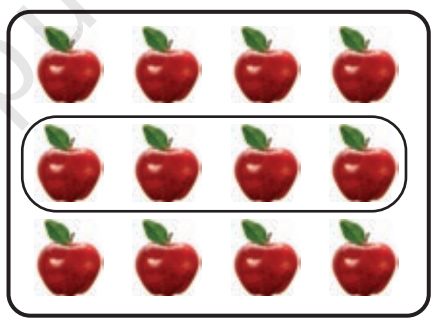
$\frac{3}{3}$ = A figure is divided into 3 equal parts and the 3 parts are coloured = whole figure =1

$\frac{4}{4}$ = A figure is divided into 4 equal parts and the 4 parts are coloured = whole figure =1

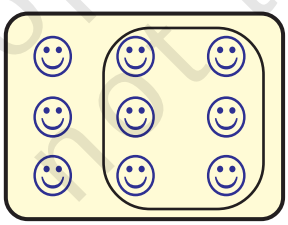
◆ **Express the number of enclosed objects as fraction–**

1. 

$\frac{3}{9}$

2. 

= ☐

3. 

= ☐

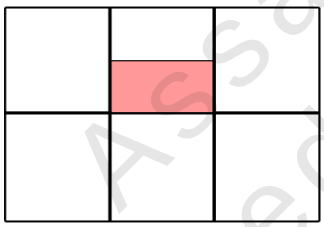
4. 

= ☐

◆ **Express as fraction–**

1. What is the fraction of the red part of the open umbrella?

2. Express the coloured part in the adjoining picture as fraction.



3. Can the coloured part of the kite be expressed as $\frac{1}{4}$? If not, why?

◆ **Denominator and numerator of a fraction-**

Look at the fraction : $\frac{3}{5}$

In this fraction, 3 is called the numerator and 5 the denominator.

That is , $\frac{3}{5}$ ← Numerator, ← Denominator — It means that out of 5 parts of a collection 3 parts have been taken

◆ **Let us write the denominator or numerator in the box–**

(i) $\frac{2}{3}$ Here, [2 is .....] (ii) $\frac{3}{7}$ Here, [7 is .....]

◆ Find out the denominator and numerator of the fractions given below and mention them in the boxes–

Fraction	Denominator	Numerator
$\frac{7}{8}$	8	7
$\frac{9}{10}$		
$\frac{3}{9}$		
$\frac{3}{11}$		

◆ **Write down in fractional form–**

a) Denominator 5, Numerator 2 $\frac{2}{5}$

b) Denominator 10, Numerator 3

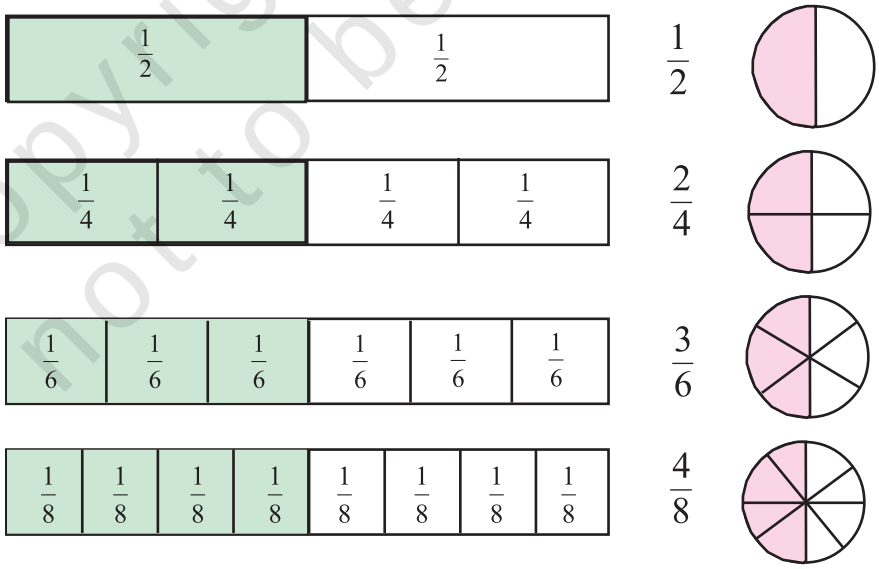
c) Denominator 7, Numerator 3

d) Denominator 13, Numerator 7

e) Denominator 8, Numerator 5

f) Denominator 23, Numerator 12

◆ **Observe the fractions :**



$\frac{1}{2}$ $\frac{2}{4}$ $\frac{3}{6}$ $\frac{4}{8}$

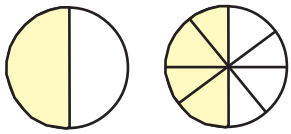
What have you got?

$$\frac{1}{2}=\frac{2}{4}=\frac{3}{6}=\frac{4}{8} \quad .....$$

Such fractions are called equivalent fractions or equal fractions.

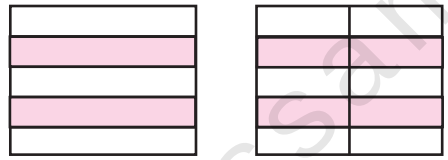
◆ **Let us practise–**

(i)



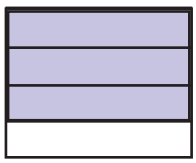
$\frac{1}{2}$ = $\frac{4}{8}$

(ii)

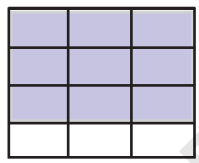


$\frac{2}{5}$ = $\frac{\quad}{\quad}$

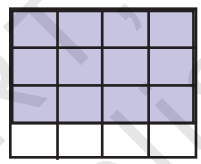
(iii)



$\frac{3}{4}$



$\frac{\quad}{\quad}$



$\frac{\quad}{\quad}$

◆ **Put appropriate numbers in denominator and numerator–**

(i) $\frac{1}{2} = \frac{2}{4}$

(ii) $\frac{3}{7} = \frac{6}{\square}$

(iii) $\frac{1}{4} = \frac{\square}{12}$

(iv) $\frac{2}{5} = \frac{4}{\square} = \frac{\square}{15}$

(v) $\frac{3}{4} = \frac{12}{\square} = \frac{\square}{20}$

Mind that

$\frac{1}{2}=\frac{1\times2}{2\times2}=\frac{2}{4}$

$\frac{1}{2}=\frac{1\times3}{2\times3}=\frac{3}{6}$

$\frac{1}{2}=\frac{1\times4}{2\times4}=\frac{4}{8}$ etc.

◆ **With the help of pictures demonstrate fractions equivalent to $\frac{1}{3}$.**

◆ **Fill up the gaps–**

a. $\frac{1}{2} = \frac{3}{6} = \frac{5}{10} = \square = \square = \square$

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

c. $\frac{1}{5} = \frac{2}{10} = \frac{3}{15} = \square = \square = \square$

d. $\frac{1}{7} = \frac{3}{21} = \frac{4}{28} = \square = \square = \square$

Decimal Fraction

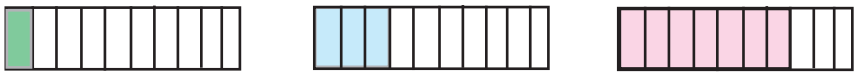
This time Manish invited some friends to his birthday. His father bought a cake with other items on the occasion. At scheduled time Manish with his mother cut the cake and he was showered with birthday wishes from all. His mother made 10 equal pieces of the cake and fed Manish with one of them. Manish also fed his mother with one piece of it. Let us see who gets how many picees!

Manish and his mother	$\frac{2}{10}$	two tenth
Thomas	$\frac{1}{10}$	..... tenth
Mustaq	$\frac{2}{10}$	two tenth
Barnam	$\frac{1}{10}$	..... tenth
Manish's father and other guests	$\frac{4}{10}$	..... tenth

Have you noticed one thing? Each of the preeding fractions has 10 as denominator. That is, each piece is equal to one of the 10 equal parts of the cake. This symbol,

is called **one tenth** or one of ten parts.

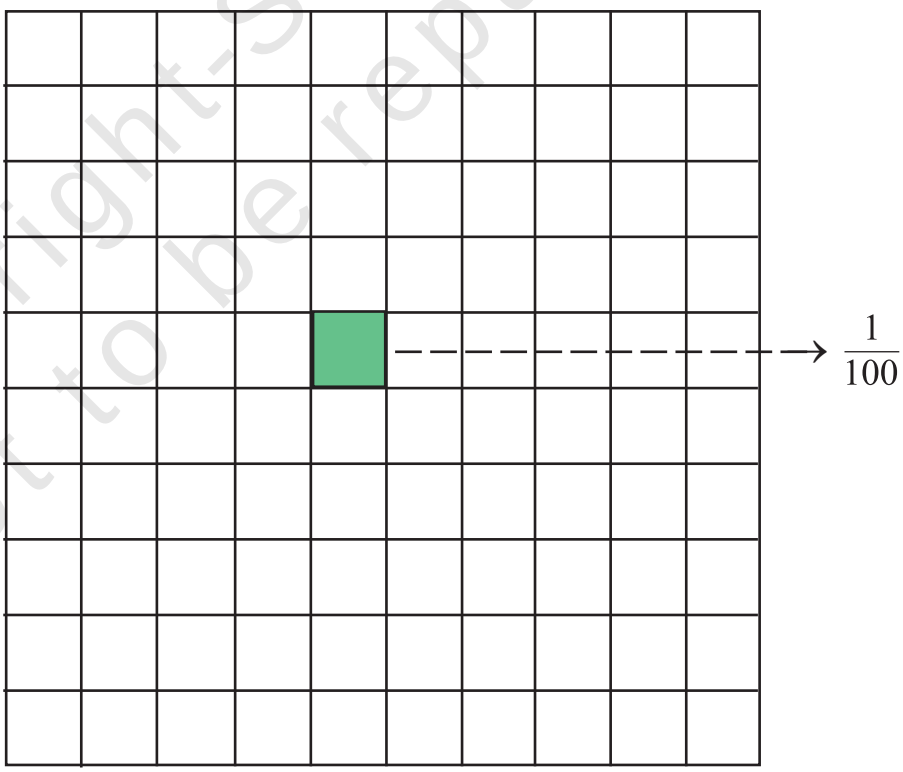
◆ **Look at the pictures below–**



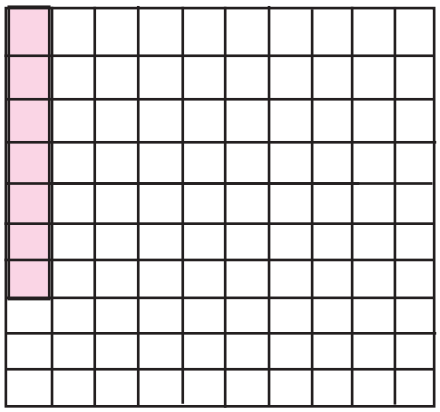
$\frac{1}{10}$ $\frac{3}{10}$ $\frac{7}{10}$

◆ **Activity :**

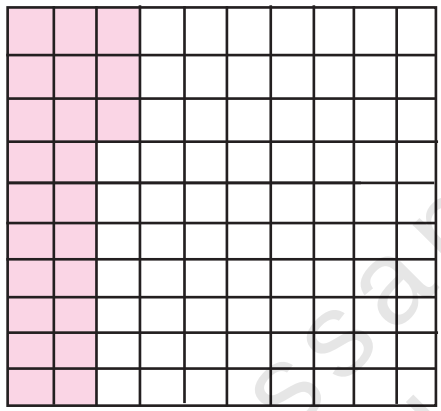
Take a square piece of paper of length 10 cm. Now, divide the paper into 100 equal squares by drawing lines along both length and breadthwise as shown in the picture. Then colour one of these small squares. The coloured part is $\frac{1}{100}$ or **one hundredth** part of the whole paper or **one percent**.



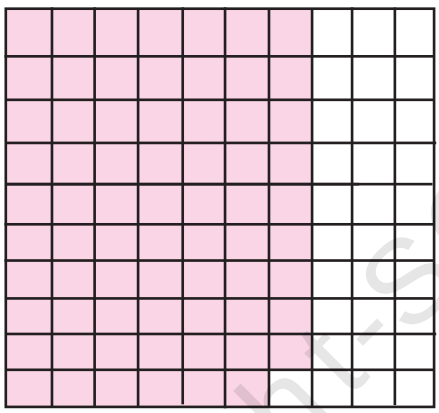
Express the following coloured parts as fractions–



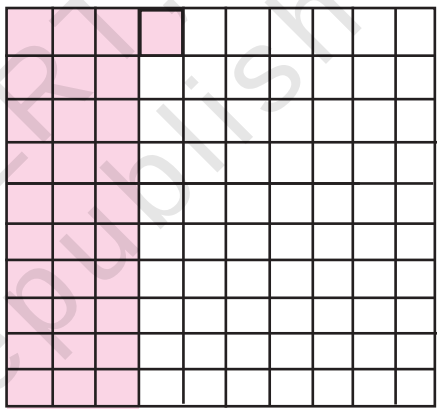
$\frac{....}{100}$



$\frac{....}{100}$



$\frac{....}{100}$



$\frac{....}{100}$

◆ **Idea of decimals–**

Notice the fractions given below–

$$\frac{7}{10} \quad \frac{3}{10} \quad \frac{18}{100} \quad \frac{29}{1000}$$

The denominators of these fractions are 10, 100, 1000 etc. The fractions with 10, 100, 1000 etc as denominators are called **decimal fractions**.

We can express the decimal fractions in another way also.

$\frac{1}{10}$ is written as 0.1. It is read as 'zero decimal one'. The notation (.) is called 'decimal symbol'.

In the same manner, $\frac{2}{10} = 0.2$ (zero decimal two), $\frac{3}{10} = 0.3$ (zero decimal three) etc.

Again, $\frac{1}{100} = 0.01$ (zero decimal zero one)

$\frac{7}{100} = 0.07$ (zero decimal zero seven)

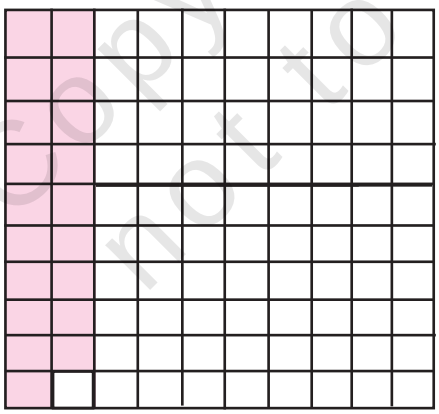
$\frac{13}{100} = 0.13$ (zero decimal one three)

The digits to the right hand side of decimal point i.e., the digits of the decimal fraction should be read one by one.

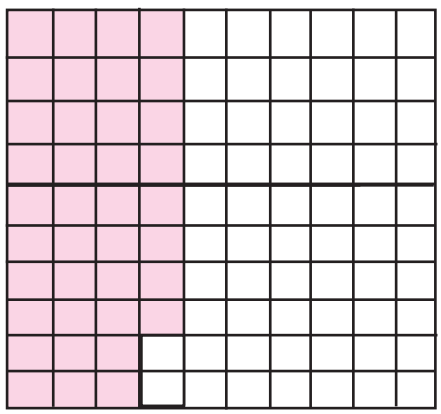
Let us fill up the table–

Fraction	$\frac{4}{10}$	$\frac{6}{10}$	$\frac{3}{10}$	...	$\frac{2}{10}$	$\frac{8}{100}$	....	$\frac{9}{100}$
Decimal fraction	0.4	...	...	0.7	....	0.08	0.05	...

Let us express the coloured parts as fraction and then as decimal fraction-



$\frac{19}{100}$
$= 0.19$



$\frac{\square}{100}$
$= \square$

Let us read the following decimal numbers–

(a) 5.4 (b) 10.7 (c) 7.89 (d) 8.001

Notice the following table.

10 paise = 1 of 10 parts of Rs. 1 = $\frac{1}{10}$ = Rs. 0.1
1 paise = 1 of 10 parts of Rs. 1 = $\frac{1}{100}$ = Rs. 0.01
1 centemeter = 1 of 10 parts of 1 m. = $\frac{1}{100}$ m. = 0.01 m.
1 meter = 1 of 1000 parts of 1 km. = $\frac{1}{1000}$ km. = 0.001 km.

Decimal fractions $\frac{1}{10}$, $\frac{1}{100}$ etc. can also be expressed respectively as 0.1, 0.01 etc.

Place values of decimal fractions–

tenth	hundredth	thousanth	ten thousanth
$\frac{1}{10} = 0.1$	$\frac{1}{100} = 0.01$	$\frac{1}{1000} = 0.001$	$\frac{1}{10000} = 0.0001$

Now, look at the following–

1 4 5. 2 3

- place value of 3 is $\frac{3}{100} = 0.03$
- place value of 2 is $\frac{2}{10} = 0.2$
- place value of 5 is $5 \times 1 = 5$
- place value of 4 is $\times 10 = 40$
- place value of 1 is $1 \times 100 = 100$

Remamber :

I am called tenth
As I'm part of ten
Fraction is my clan
Know it for certain.

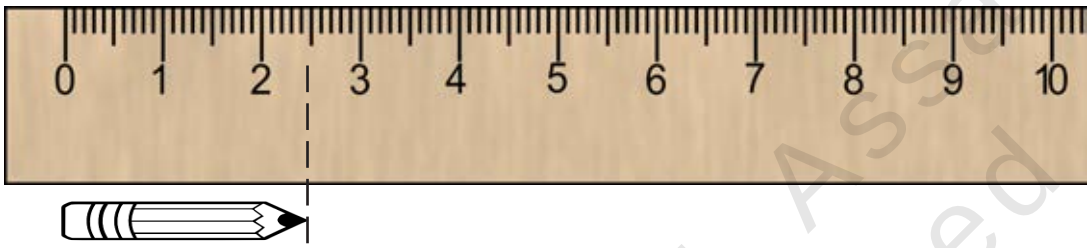
$\frac{2}{10} = 0.2$ is called two tenth and $\frac{3}{100} = 0.03$, the three handredth.

Let us do the following ourselves–

(a) $\frac{5}{10}$ (b) $\frac{7}{100}$ (c) $\frac{50}{1000}$ (d) $\frac{2}{1000}$

(e) $\frac{60}{100}$ (f) $\frac{750}{1000}$ (g) $\frac{9}{10}$ (h) $\frac{10}{1000}$

Let us measure our pencils–



Tell the length of the pencil by looking at the scale. Isn't it 2 cm. and 5 mm.?

That is, 2 cm. and $\frac{5}{10}$ cm.

or, it is 2 cm. and 0.5 cm. = 2.5 cm.

Measure your own pencil and write down its length.

Complete the table–

Fraction	Decimal fraction	Let us read
$\frac{2}{10}$	0.2	Zero decimal two
	0.3	Zero decimal three
	0.5	
$\frac{9}{10}$		
		Zero decimal nine one
	0.54	
		Zero decimal zero five

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