e-BRIGHT ACADEMY
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Dividing Fraction

5.NF.B.7

Name: _____

Date : ___ / ___ / _____
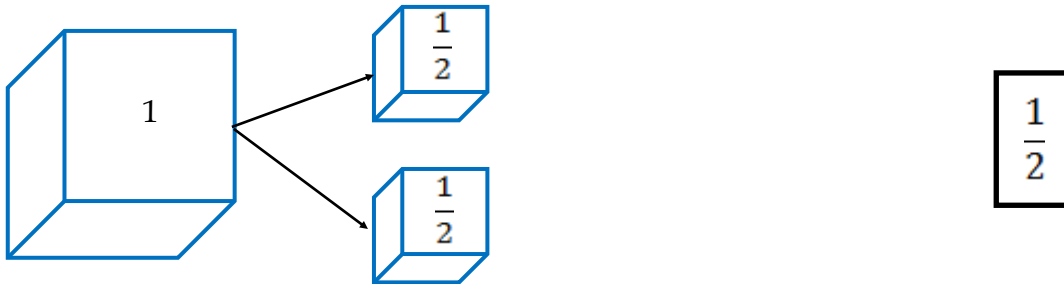
Level _____ / Code_____

If an Object is divided into different parts then no. of that part out of the main count is called fraction.

e.g. **1] Hay**

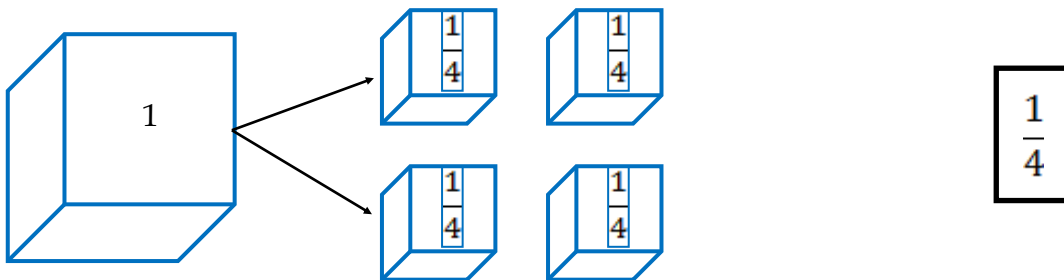If any object is divided into two equal parts, then each of the part is one half of that object.

One half of the whole is shown by the fraction $\dfrac{1}{2}$

e.g. **2] Quarter**

If the object is divided into four equal parts. Each of those parts is a quarter of the whole.

One Quarter is shown by the fraction the fraction $\dfrac{1}{4}$,which is need as one fourth or 'one quarter' or one upon four.

Dividing Fraction

"Dividing fraction is, keep first as it is then turning over the second fraction and multiply. After these just do a simplification".

e.g.

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

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Explanation :

Step 1

Dividing by fraction is just like multiplying fraction, except for one additional step. To divide any number by a fraction, first reciprocal of the fraction and then multiply the number by the reciprocal of the fraction.

Step 2

While Dividing invert fraction:-

To multiply two fractions, we multiply the numerator and multiply the denominators to get the new denominators. Simply to divide the numerator of the first fraction by the numerator of the second and then similarly to divide one denominator by the other.

$$\textbf{Ans :} \quad \frac{1}{3} \times \frac{2}{6}$$

$$= \frac{6}{6}$$

$$\therefore \quad 1$$

In the fraction numerator and denominator as below.

Eg. $\dfrac{3}{5}, \dfrac{8}{3}, \dfrac{6}{7}, \dfrac{3}{4}, \dfrac{1}{6}$

	Fraction	Numerator	Denominator
1]	$\dfrac{3}{5}$	3	5
2]	$\dfrac{8}{3}$	8	3
3]	$\dfrac{6}{7}$	6	7
4]	$\dfrac{3}{4}$	3	4
5]	$\dfrac{1}{6}$	1	6

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Dividing Fraction :-

1] $\frac{1}{4} \div \frac{1}{2}$

Step 1 :- Turn the second fraction upside down. (The Reciprocal)

So $\frac{1}{2}$ become $\frac{2}{1}$

Step 2 :- Multiply the first fraction by that reciprocal.

$\frac{1}{4} \times \frac{2}{1}$ $\frac{1 \times 2}{4 \times 1}$ $\frac{2}{4}$

Step 3 :- Simplify the fraction

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

So answer is $\frac{1}{2}$

2] Make the whole number a fraction, by putting it over 1.

Eg. 4 is also $\frac{4}{1}$

If the sum is $\frac{3}{2} \div 4$

Step 1 :- Turn the second fraction upside down. (The Reciprocal)

So $\frac{4}{1}$ becomes $\frac{1}{4}$

Step 2 :- Multiply the first fraction by that reciprocal.

$\frac{3}{2} \times \frac{1}{4} = \frac{3 \times 1}{2 \times 4} = \frac{3}{8}$

So answer is $\frac{3}{2} \div 4 = \frac{3}{8}$

3] Other Example

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

Step 1 :- Now we can write

2 becomes $\frac{2}{1}$

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Step 2 :- Turn the second fraction

So $\frac{1}{3}$ becomes $\frac{3}{1}$

Step 2 :- Multiply the first fraction by that reciprocal.

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

So answer is $2 \div \frac{1}{3} = 6$

Reason of the fraction upside down :-
   Dividing is the opposite of multiplying !

A fraction says to:-
   Multiply by the top number
   Dividing by the bottom number

$$\frac{2}{3} \Longrightarrow \begin{array}{c} \times 2 \\ \div 3 \end{array}$$

But for division we:-
Divide by the top number
Multiply by the bottom number

That mean, dividing by $\frac{3}{4}$ is the same as Multiplying by $\frac{4}{3}$

$$\div \frac{3}{4} \Longrightarrow \begin{array}{c} \div 3 \\ \times 4 \end{array} \quad \text{same} \quad \times \frac{4}{3} \Longrightarrow \begin{array}{c} \times 4 \\ \div 3 \end{array}$$

Reduce fractions to the lowest terms:-
   1] Break down both the numerator (Top Number) and Denominator (Bottom number) into their prime factors.
   2] Cross out any common factors.
   3] Multiply the remaining numbers to get the reduced numerator and denominator.

Other type of fractions :-

1]   0.125 is $\frac{125}{1000}$

2]   12.5 is $\frac{125}{10}$

3]   1.25 is $\frac{125}{100}$

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Different examples :-

1] $\dfrac{2}{5} \div \dfrac{3}{4}$

Ans : $\dfrac{2}{5} \times \dfrac{4}{3}$

$= \dfrac{2 \times 4}{5 \times 3}$

$= \dfrac{8}{15}$

$\therefore \dfrac{2}{5} \div \dfrac{3}{4} = \dfrac{8}{15}$

2] $\dfrac{5}{2} \div \dfrac{4}{6}$

Ans : $\dfrac{5}{2} \times \dfrac{4}{6}$

$= \dfrac{5 \times 6}{2 \times 4}$

$= \dfrac{30}{8}$

$= \dfrac{10}{4}$

$\therefore \dfrac{5}{2} \div \dfrac{4}{6} = \dfrac{10}{4}$

3] $\dfrac{9}{7} \div \dfrac{2}{5}$

Ans : $\dfrac{9}{7} \times \dfrac{5}{2}$

$= \dfrac{9 \times 5}{7 \times 2}$

$= \dfrac{45}{14}$

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$$\therefore \frac{9}{7} \div \frac{2}{5} = \frac{45}{14}$$

4] $3 \div \dfrac{5}{7}$

Ans : $\dfrac{3}{1} \times \dfrac{5}{7}$

$= \dfrac{3 \times 7}{1 \times 5}$

$= \dfrac{21}{5}$

$\therefore \ 3 \div \dfrac{5}{7} = \dfrac{21}{5}$

5] $\dfrac{9}{3} \div 4$

Ans : $\dfrac{9}{3} \times \dfrac{1}{4}$

$= \dfrac{9 \times 1}{3 \times 4}$

$= \dfrac{9}{12}$

$\therefore \ \dfrac{9}{3} \div 4 = \dfrac{9}{12}$

6] $0.12 \div \dfrac{6}{2}$

Ans : $\left(\therefore \ 0.12 = \dfrac{12}{100} \right)$

$= \dfrac{12}{100} \times \dfrac{2}{6}$

$= \dfrac{24}{600}$

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$$\therefore \quad 0.12 \div \frac{6}{2} = \frac{24}{600}$$

7] $\frac{8}{2} \div 0.24$

Ans : $\frac{8}{2} \div \frac{24}{100}$

$= \frac{8}{2} \times \frac{100}{24}$

$= \frac{800}{48}$

$\therefore \quad \frac{8}{2} \div 0.24 = \frac{800}{48}$

8] $\frac{7}{2} \div \frac{5}{3}$

Ans : $\frac{7}{2} \times \frac{3}{5}$

$= \frac{21}{10}$

$\therefore \quad \frac{7}{2} \div \frac{5}{3} = \frac{21}{10}$

9] $\frac{11}{2} \div 0.23$

Ans : $\left(\therefore 0.23 = \frac{23}{100} \right)$

$= \frac{11}{2} \div \frac{23}{100}$

$= \frac{11}{2} \times \frac{100}{23}$

$= \frac{11 \times 100}{2 \times 23}$

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$$= \frac{1100}{46}$$

$$= \frac{2 \times 550}{2 \times 23}$$

$$= \frac{550}{23}$$

$$\therefore \quad \frac{11}{2} \div 0.23 = \frac{550}{23}$$

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Word Problems

Q. 1 | if $\dfrac{12}{25}$ part of the work was done in 120 day's then, How much work was done in 1 day?

Ans : $\dfrac{12}{25}$ part of the work was done in 120 days.

∴ How much work was done in 1 day?

$= \dfrac{12}{25} \div 120$

$= \dfrac{\overset{1}{\cancel{12}}}{25} \times \dfrac{1}{\underset{1}{\cancel{120}}}$

$= \dfrac{1}{250}$ part.

∴ $\dfrac{1}{250}$ part of the work was done in 1 day.

Q. 2 | 45 students collected $\dfrac{3}{5}$ part of the total collection. What is the collection of each student?

Ans : $\dfrac{3}{5}$ part of the total collection of 45 students.

∴ What is the collection of each student?

$= \dfrac{3}{5} \div 45$

$= \dfrac{\overset{1}{\cancel{3}}}{5} \times \dfrac{1}{\underset{15}{\cancel{45}}}$

$= \dfrac{1}{75}$ part.

∴ $\dfrac{1}{75}$ part is the collection of each student.

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Q. 3 Dean has a piece of wood that is $\frac{3}{4}$ of a foot in length. He needs to cut pieces that are $\frac{1}{16}$ of a foot long. How many pieces can dean can cut?

Ans : $\frac{3}{4} \div \frac{1}{16}$

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

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

$= \frac{48}{4}$

$=$ 12 Pieces

$\therefore$ Dean cut 12 Pieces

Q. 4 Tia has of an hour $\frac{2}{3}$ to complete her essay. If it takes the $\frac{1}{9}$ of an hour write paragraphs. How many paragraphs can she complete in the time she has left?

Ans : $\frac{2}{3} \div \frac{1}{9}$

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

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

$= \frac{18}{3}$

$=$ 6

$\therefore$ 6 Paragraph complete

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Q. 5 $\dfrac{3}{4}$ gallons of cake batter is poured equally into 2 bowls. How many gallons are in each bowl?

Ans : $\dfrac{3}{4} \div 2$

$= \dfrac{3}{4} \div \dfrac{2}{1}$

$= \dfrac{3}{4} \times \dfrac{1}{2}$

$= \dfrac{3 \times 1}{4 \times 2}$

$= \dfrac{3}{8}$

$\therefore \dfrac{3}{8}$ Gallons are in each bowl

Q. 6 Gary and his brother made $\dfrac{1}{2}$ of a gallon of lemonade to sell at their lemonade stand. They divided the lemonade equally among 4 paper cups. How much lemonade was in each paper cup?

Ans : $\dfrac{1}{2}$ gallons $\div$ 4 cups

$= \dfrac{1}{2} \div \dfrac{4}{1}$

$= \dfrac{1}{2} \times \dfrac{1}{4}$

$= \dfrac{1 \times 1}{2 \times 4}$

$= \dfrac{1}{8}$

$\therefore \dfrac{1}{8}$ Lemonade in each paper cup

Notes :