

FRACTIONS AND DECIMALS

CLASS 7
LESSON 2
MODULE 2

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LEARNING OBJECTIVES

The following topics are covered in detail in

Module 2- MULTIPLICATION AND DIVISION OF FRACTIONS

1

- Multiplication of a fraction by a whole number

2

- Multiplication of a fraction by a fraction

3

- Division of a whole number by a fraction



4

- Division of a fraction by a whole number

5

- Division of a fraction by a fraction

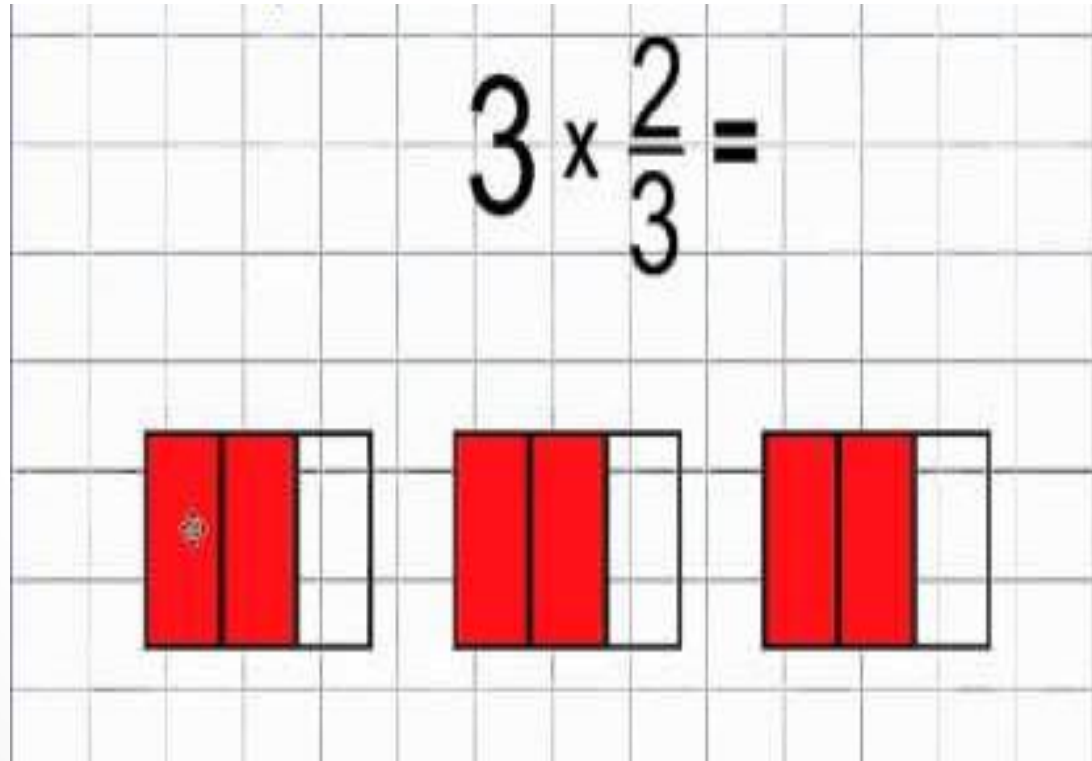
1. Multiply a whole number by a fraction and vice versa


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

$$\frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{3}{6}$$

To multiply a whole number with a proper or an improper fraction (and vice versa),

we **multiply the whole number with the numerator of the fraction**, keeping the **denominator same**.

Try This !!!



But if the fraction is
a mixed fraction ?



I guess I know!!!!
First **convert the
mixed fraction to an
improper fraction** and then
multiply.

$$3\frac{1}{2} \times 5 = \frac{7}{2} \times 5 = \frac{7 \times 5}{2} = \frac{35}{2}$$



Porkodi has ten biscuits. She gives $\frac{2}{5}$ th (*read as two fifth*) of the biscuits to Pugazh. How many biscuits did Pugazh get ?

Here 'of' represents
multiplication

$$\frac{2}{5} \text{ of } 10 = \frac{2}{5} \times 10 = \frac{2 \times 10}{5} = \frac{20}{5} = 4$$

2. Multiply a fraction by a fraction

Multiplying Fractions

$\frac{2}{7} \times \frac{3}{5} = \frac{6}{35}$

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We multiply two fractions as

$$\frac{\text{Product of Numerators}}{\text{Product of Denominators}}$$

Note: If one the fractions or both the fractions are mixed fraction then **convert the mixed fraction to improper fraction** and then multiply

The three steps of multiplying fractions

Solve: $\frac{2}{6} \times \frac{9}{16}$

Step 1. Multiply the top numbers:

$$\frac{2}{6} \times \frac{9}{16} = \frac{2 \times 9}{16} = \frac{18}{16}$$

Step 2. Multiply the bottom numbers:

$$\frac{2}{6} \times \frac{9}{16} = \frac{2 \times 9}{6 \times 16} = \frac{18}{96}$$

Step 3. Simplify the fraction:

$$\frac{18}{96} = \frac{6}{32} = \frac{3}{16}$$

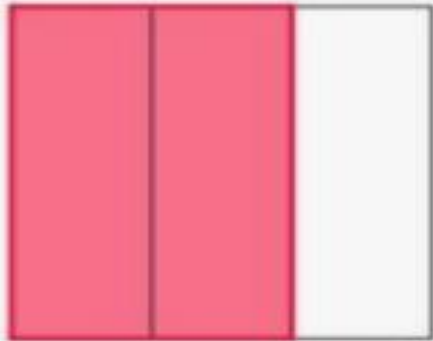
Divided by 3

Divided by 2

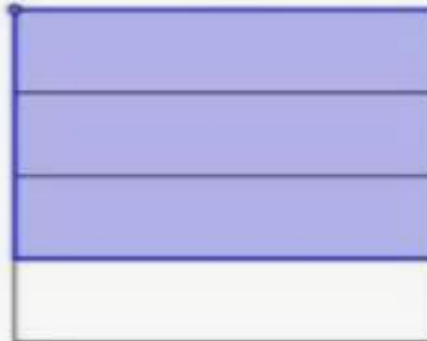


Multiplying Fractions with an Area Model

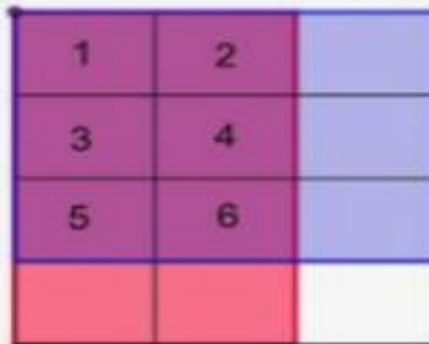
$\frac{2}{3}$



$\frac{3}{4}$



Combine the drawings



How many boxes have both colors? **6**

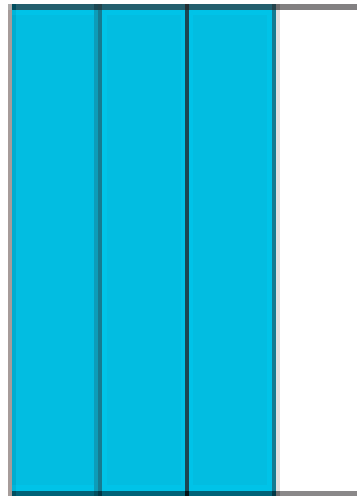
$$\frac{2}{3} \times \frac{3}{4} = \frac{6}{12}$$

How many boxes are there? **12**



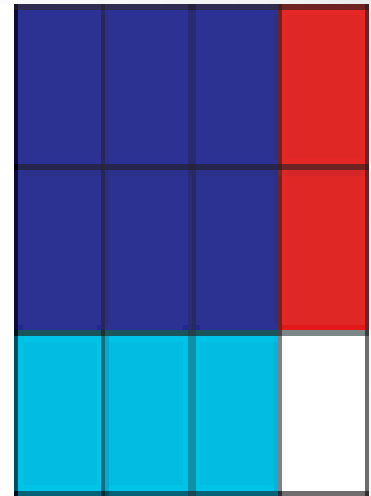
$$\frac{2}{3}$$

x

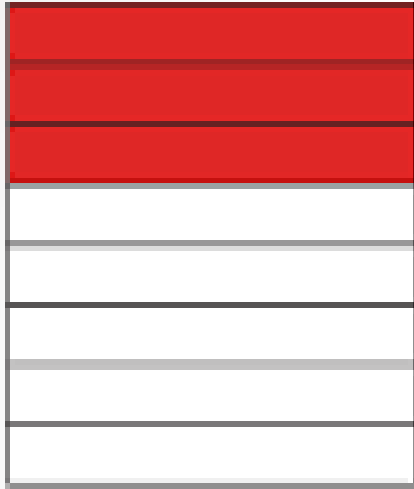


$$\frac{3}{4}$$

=

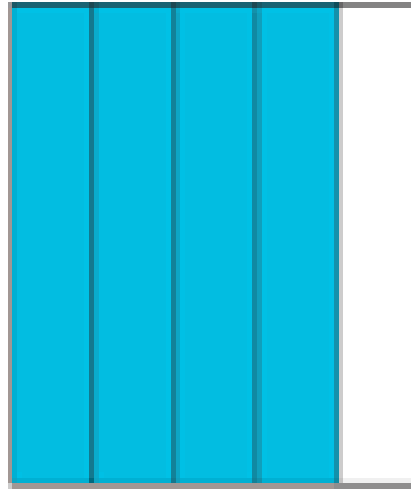


$$\frac{6}{12}$$



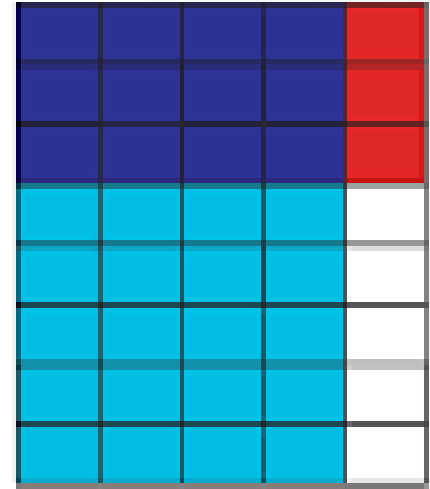
$$\frac{3}{8}$$

x



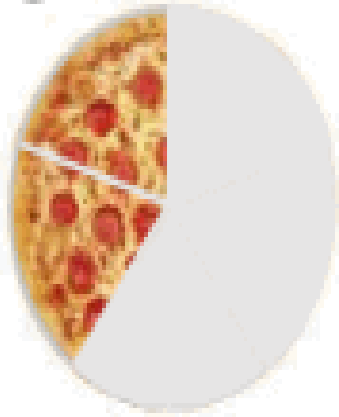
$$\frac{4}{5}$$

=

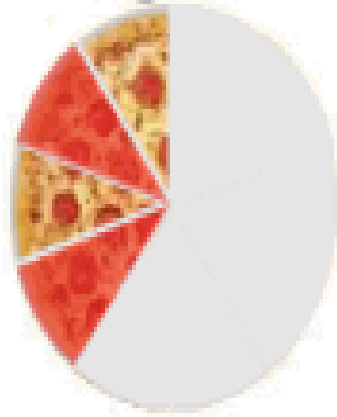


$$\frac{12}{40}$$

$$\frac{2}{5}$$



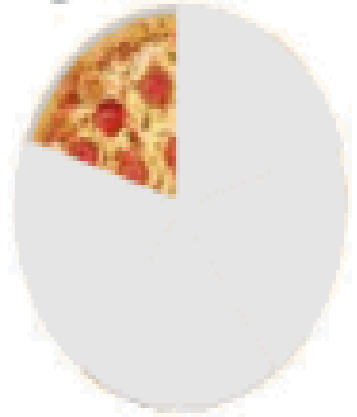
$$\frac{1}{2} \times \frac{2}{5}$$



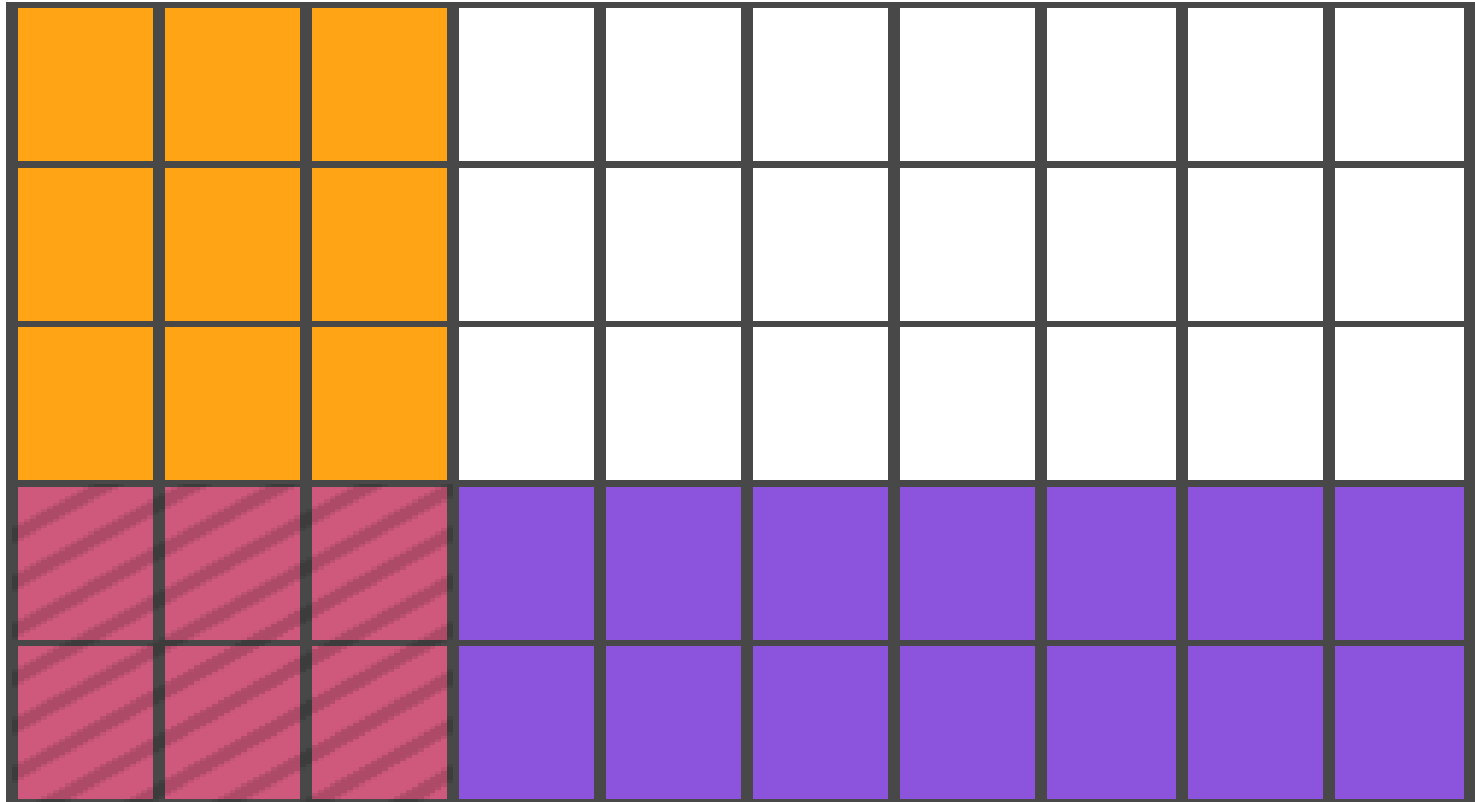
$$\frac{2}{10}$$



$$\frac{1}{5}$$



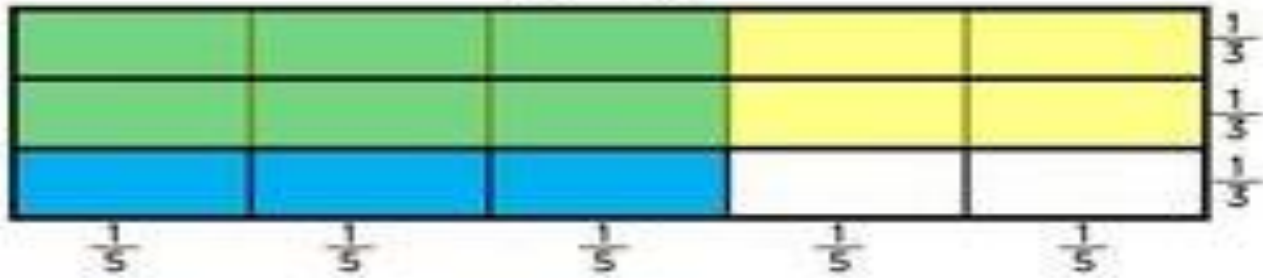
Use the model to find the product.



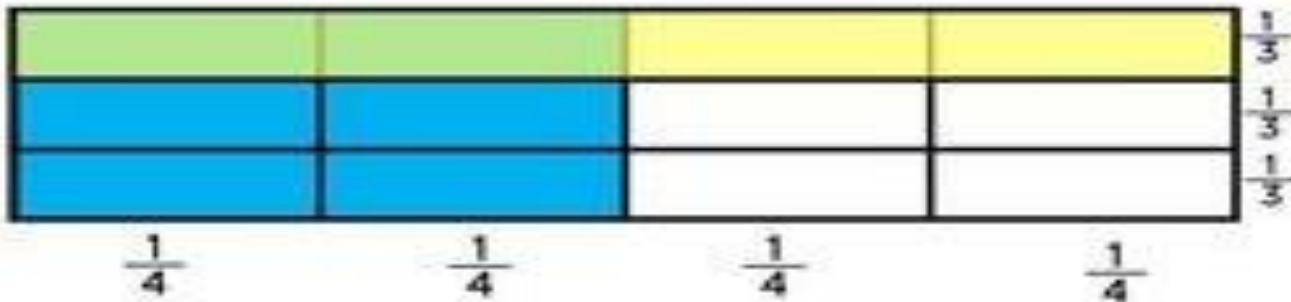
$$\frac{3}{10} \times \frac{2}{5} = \frac{\quad}{\quad}$$

Try This!!!!

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



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



Reciprocal

Before we learn division of fractions, we need to learn what a reciprocal is.

The non-zero numbers whose product with each other is 1, are called the reciprocals of each other.

The reciprocal of a fraction is obtained by **inverting** it

So reciprocal of $\frac{9}{13}$ is $\frac{13}{9}$.

$$\frac{9}{13} \times \frac{13}{9} = 1$$

3.Division of a whole number by a fraction

$$6 \div \frac{1}{2} = 6 \times 2 = 12$$

Here, we can observe that, dividing a whole number 6 by a fraction $\frac{1}{2}$ is the same as multiplying a whole number 6 by 2, where 2 is the *reciprocal* of $\frac{1}{2}$. Generally, dividing a number by a fraction is the same as multiplying that number by the reciprocal of the fraction.

Note: While dividing a whole number by a mixed fraction, first convert the **mixed fraction into improper fraction** and then solve it.

4. Division of a fraction by a whole number

To divide a fraction by any whole number , multiply that by fraction the reciprocal of that whole number.

$$\frac{1}{2} \div 2 = \frac{1}{2} \times \frac{1}{2} \text{ (reciprocal of 2 is } \frac{1}{2} \text{)}$$

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

Note: While dividing a mixed fraction by a whole number, first convert the **mixed fraction into improper fraction** and then solve it.

5. Division of a fraction by another fraction

$$\frac{15}{2} \div \frac{5}{2} = \frac{15}{2} \times \frac{2}{5} \text{ (reciprocal of } \frac{5}{2} \text{ is } \frac{2}{5} \text{)} = 3$$

Note: If one the fractions or both the fractions are mixed fraction then **convert the mixed fraction to improper fraction** and then solve it.

Solved Examples

$$1. \frac{2}{3} \div \frac{4}{5} = \frac{10}{12} = \frac{5}{6}$$

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

$$15. 5 \div \frac{7}{12} = \frac{60}{7}$$

$$2. \frac{4}{6} \div \frac{4}{5} = \frac{20}{24} = \frac{5}{6}$$

$$9. \frac{1}{2} \div \frac{1}{4} = \frac{4}{2} = 2$$

$$16. \frac{1}{5} \div \frac{7}{15} = \frac{15}{35} = \frac{3}{7}$$

$$3. \frac{4}{3} \div \frac{4}{5} = \frac{20}{12} = \frac{5}{3}$$

$$10. \frac{1}{2} \div 4 = \frac{1}{8}$$

$$17. \frac{1}{5} \div 1\frac{13}{15} = \frac{15}{140} = \frac{3}{28}$$

$$4. \frac{4}{3} \div \frac{2}{5} = \frac{20}{6} = \frac{10}{3}$$

$$11. \frac{1}{3} \div 4 = \frac{1}{12}$$

$$18. \frac{a}{5} \div 1\frac{13}{15} = \frac{15a}{140} = \frac{3a}{28}$$

$$5. \frac{3}{4} \div \frac{2}{5} = \frac{15}{8}$$

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

$$19. \frac{1}{b} \div 1\frac{13}{15} = \frac{15}{28b}$$

$$6. \frac{3}{4} \div \frac{5}{2} = \frac{6}{20} = \frac{3}{10}$$

$$13. 4 \div \frac{7}{3} = \frac{12}{7}$$

$$20. \frac{1}{5} \div 1\frac{c}{15} = \frac{15}{5(15+c)}$$

$$7. \frac{3}{4} \div \frac{1}{2} = \frac{6}{4} = \frac{3}{2}$$

$$14. 20 \div \frac{7}{3} = \frac{60}{7}$$

$$21. \frac{1}{5} \div 1\frac{13}{d} = \frac{d}{5(d+13)}$$

$$3\frac{1}{3} \div 3 = \frac{10}{9} = 1\frac{1}{9}$$

$$2\frac{1}{3} \div 2 = \frac{7}{6} = 1\frac{1}{6}$$

$$3\frac{2}{3} \div 3 = \frac{11}{9} = 1\frac{2}{9}$$

$$2\frac{1}{3} \div 10 = \frac{7}{30}$$

$$3\frac{2}{3} \div 6 = \frac{11}{18}$$

$$4\frac{2}{3} \div 10 = \frac{14}{30} = \frac{7}{15}$$

$$3\frac{2}{3} \div 2 = \frac{11}{6} = 1\frac{5}{6}$$

$$40\frac{2}{3} \div 10 = \frac{122}{30} = 4\frac{2}{30} = 4\frac{1}{15}$$

[Practise fraction multiplication\(CLICK HERE\)\)\)](#)

[Practise dividing Fractions\(CLICK HERE\)](#)

End of Module 2