Circle

1

$\frac{2}{2}$

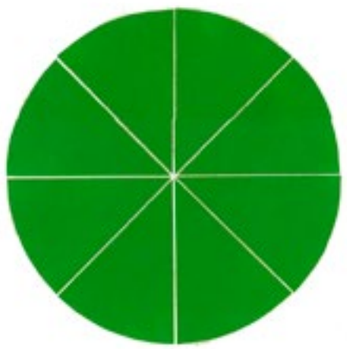
$\frac{3}{3}$

$\frac{4}{4}$

$\frac{5}{5}$

$\frac{6}{6}$

$\frac{7}{7}$



$\frac{8}{8}$

$\frac{9}{9}$

$\frac{10}{10}$

Equivalences

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

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

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

$\frac{5}{10}$ = $\frac{1}{2}$

Equivalences

$\frac{2}{6}$

=

$\frac{1}{3}$

Equivalences

$\frac{2}{8}$

=

$\frac{1}{4}$

$\frac{3}{9}$

=

$\frac{1}{3}$

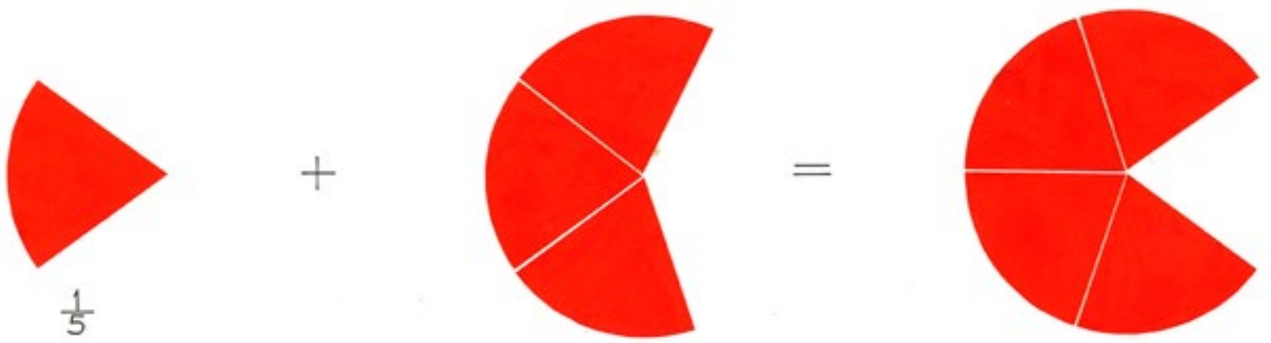
$\frac{2}{10}$

=

$\frac{1}{5}$

Addition

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

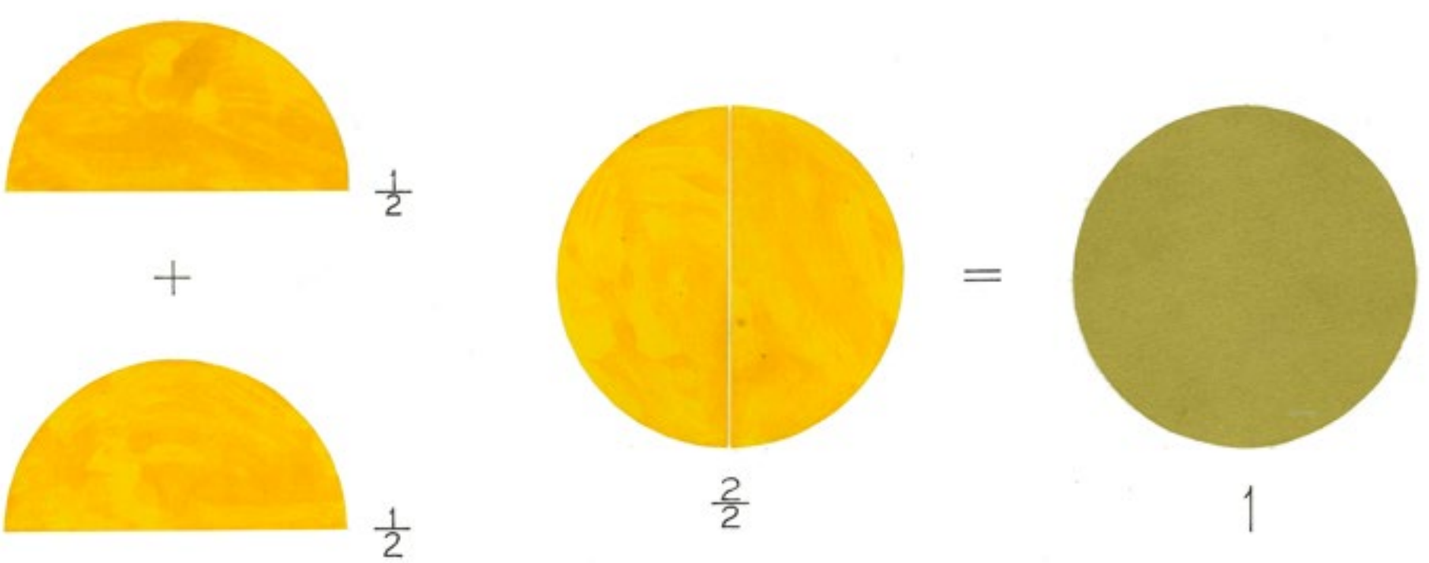


$\frac{1}{5}$ $\frac{3}{5}$ $\frac{4}{5}$

$\frac{1}{5} + \frac{3}{5} = \frac{4}{5}$

Addition

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



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

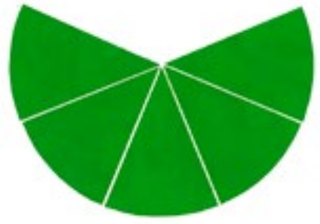
When fractions have the same denominator, the operations are carried out on the numerators. To the result is given the same denominator as that of the fractions.

Addition

$\frac{1}{4} + \frac{3}{8} =$

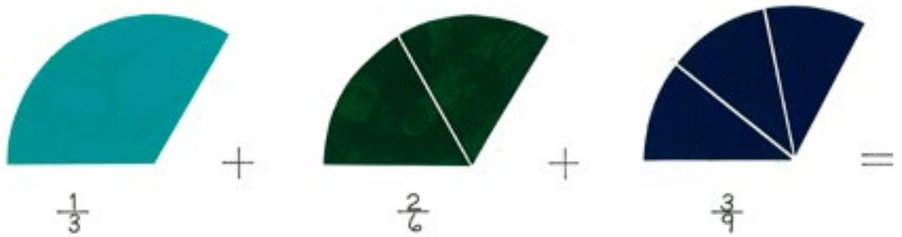
=

=



$\frac{1}{4} + \frac{3}{8} = \frac{5}{8}$

Addition $\frac{1}{3}+\frac{2}{6}+\frac{3}{9}=$



$\frac{1}{3}+\frac{2}{6}+\frac{3}{9}=1$

If we multiply or divide the numerator and denominator of a fraction by the same number, the value remains the same.

For example: $\frac{2}{4}=\frac{1}{2}$;

if the numerator and denominator of the first fraction are both divided by 2, we obtain the second:

$\frac{2\div2}{4\div2}=\frac{1}{2}$ $\qquad$ $\frac{1}{2}=\frac{2}{4}$;

if the numerator and denominator of the first fraction are both multiplied by 2, we obtain the second:

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

If we multiply or divide the numerator and denominator of a fraction by the same number, the value remains the same.

For example: $\frac{2}{4} = \frac{1}{2}$;

if the numerator and denominator of the first fraction are both divided by 2, we obtain the second:

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

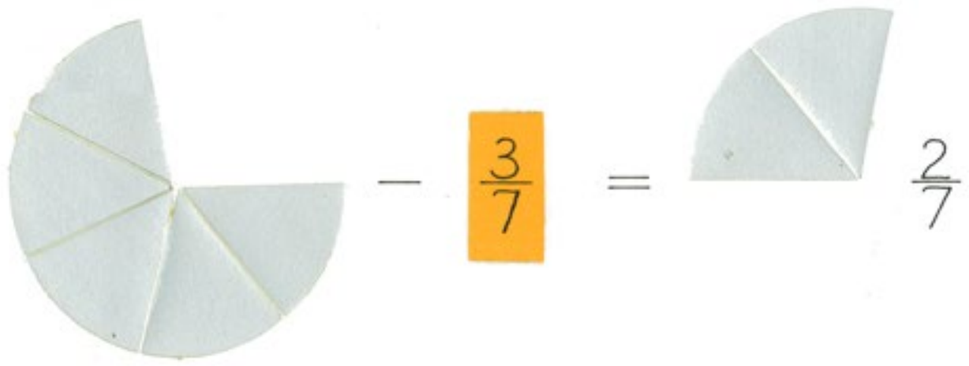
$\frac{1}{2} = \frac{2}{4}$;

if the numerator and denominator of the first fraction are both multiplied by 2, we obtain the second:

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

Subtraction

$\frac{5}{7} - \frac{3}{7} =$



$\frac{5}{7} - \frac{3}{7} = \frac{2}{7}$

Subtraction

$\frac{1}{2} - \frac{2}{10} =$

— $\frac{2}{10}$ =

= — $\frac{2}{10}$ =

= $\frac{3}{10}$ $\frac{1}{2} - \frac{2}{10} = \frac{3}{10}$

To subtract two fractions of different denominators, it is necessary first to change them to the same denominator, and then proceed with the operation.

Multiplication

$\frac{2}{7} \times 3 =$

$\frac{2}{7}$ × 3 =

= 

$\frac{2}{7}$ $\frac{2}{7}$ $\frac{2}{7}$ =

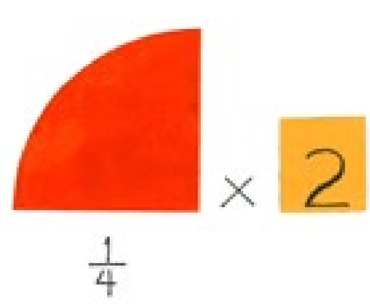
= 

$\frac{6}{7}$

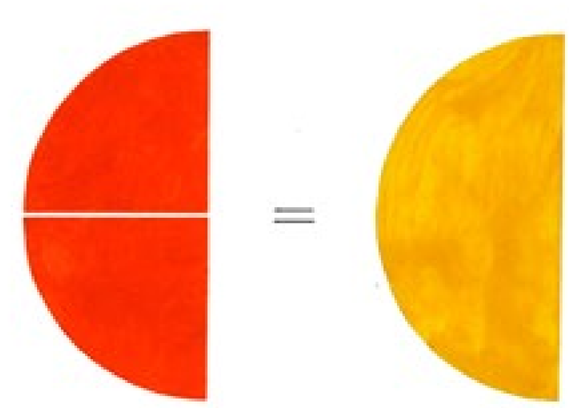
$\frac{2}{7} \times 3 = \frac{6}{7}$

Multiplication

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

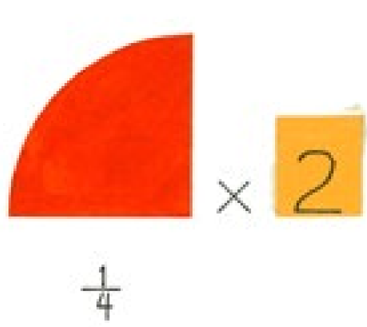


$\frac{1}{4}$ × 2 = the numerator is multiplied by 2.



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

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



$\frac{1}{4}$ × 2 = the denominator is divided by 2.

$\frac{1}{2}$

Rule: When multiplying a fraction by a whole number, one can multiply the numerator by the whole number or, if divisible, divide the denominator by the whole number.

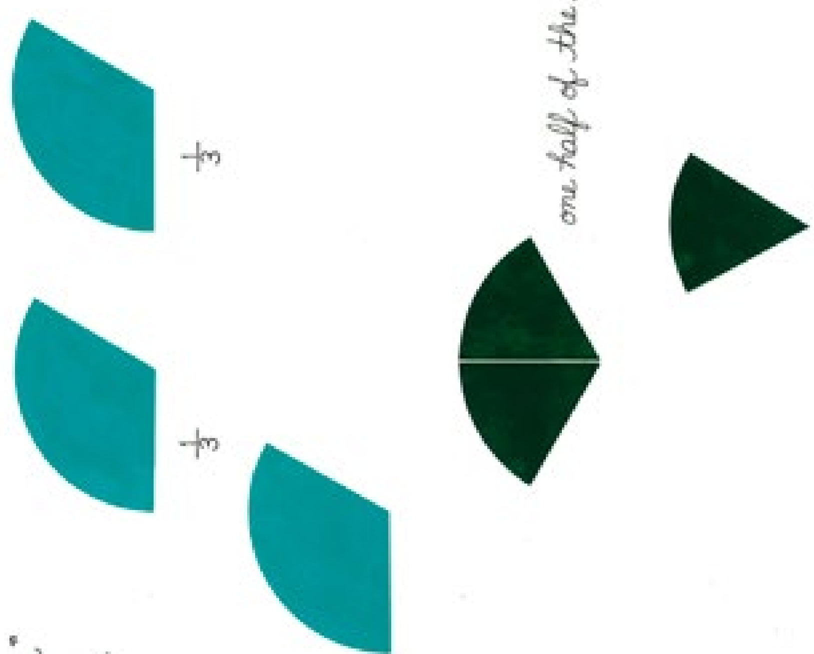
$\frac{1}{4} \times 2 = \frac{1}{4 \div 2} = \frac{1}{2}$

Multiplication

multiplication means "to take"

to say $\frac{1}{3} \times 2$ means to take

to say $\frac{1}{3} \times \frac{1}{2}$ means to take



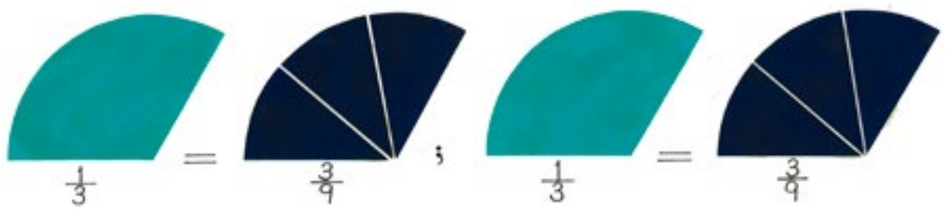
$\frac{1}{3}$ $\frac{1}{3}$

one half of the piece $\frac{1}{3}$.

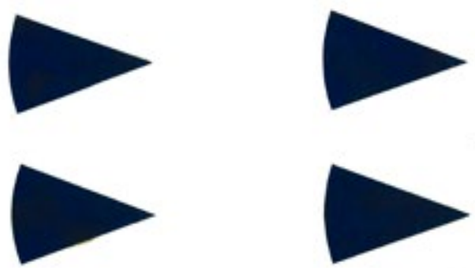
Multiplication

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

× $\frac{2}{3}$ means that one must first divide each  in three parts



then take two parts of each third

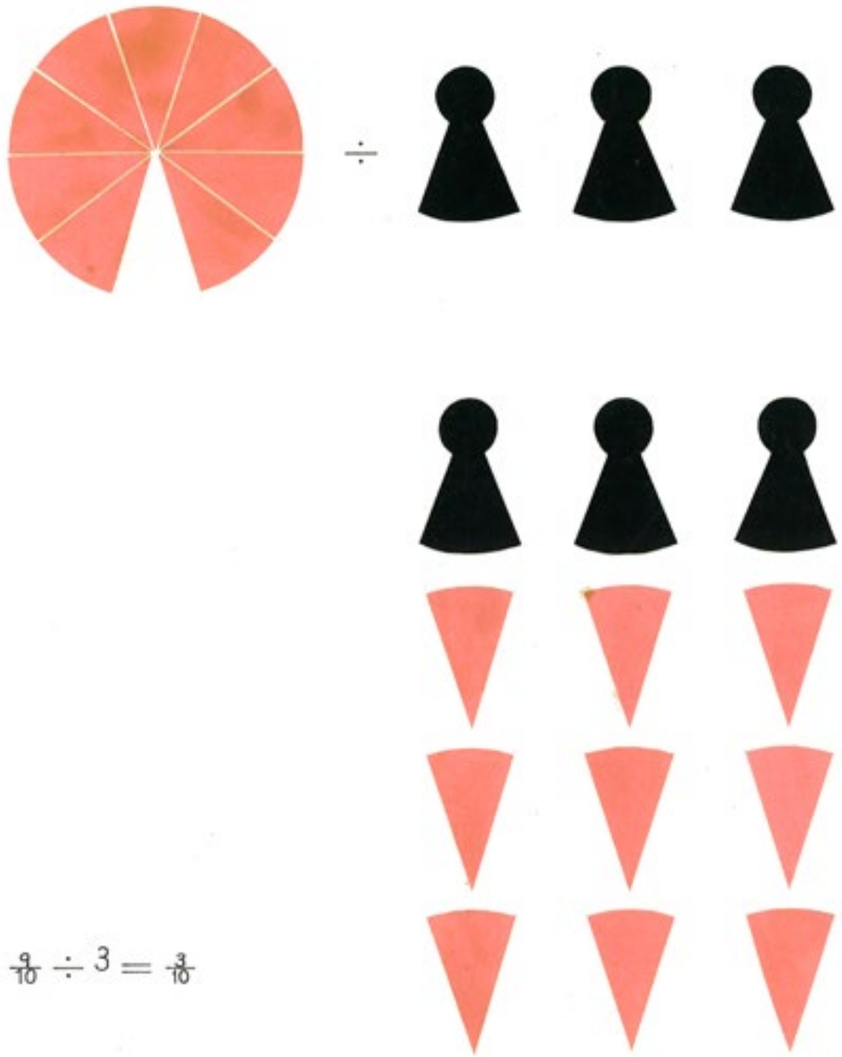


$\frac{2}{3} \times \frac{2}{3} = \frac{4}{9}$

Rule: To multiply a fraction by another fraction, one must multiply numerator by numerator and denominator by denominator.

Division

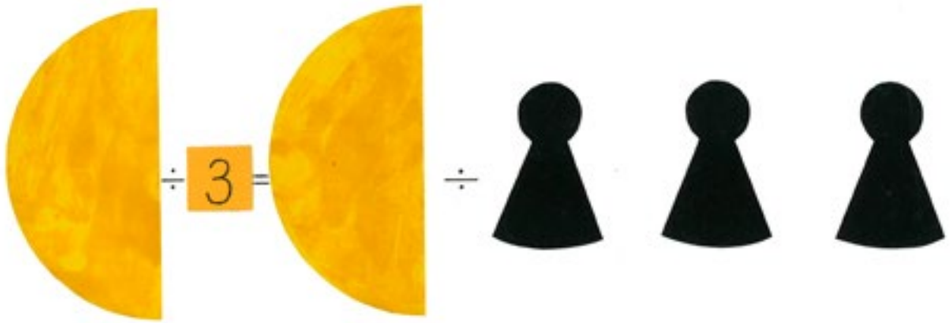
$\frac{9}{10} \div 3 =$

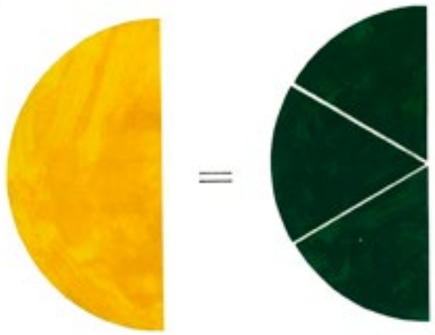


$\frac{9}{10} \div 3 = \frac{3}{10}$

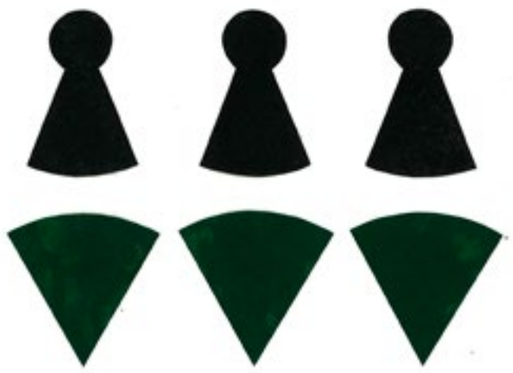
Division

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





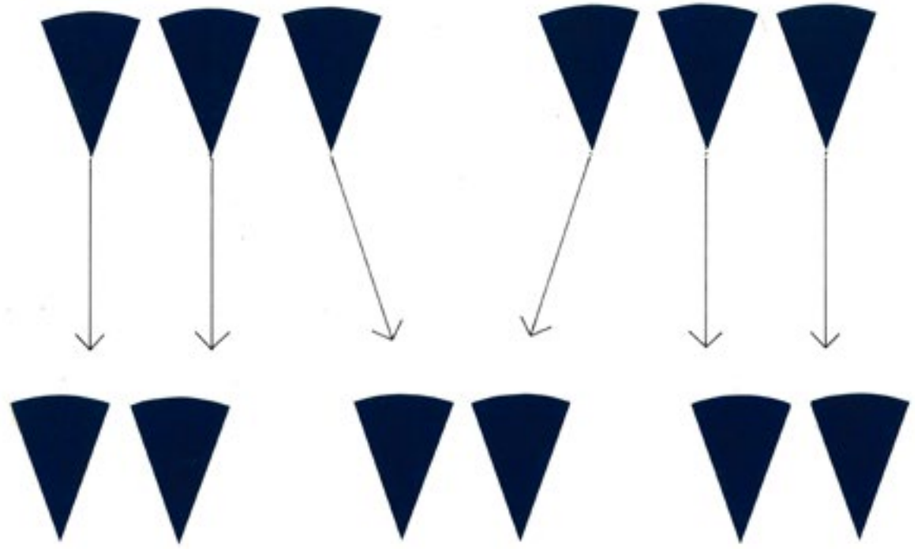
Rule: To divide a fraction by a whole number, instead of dividing the numerator, one can multiply the denominator by that number.



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

Group Division

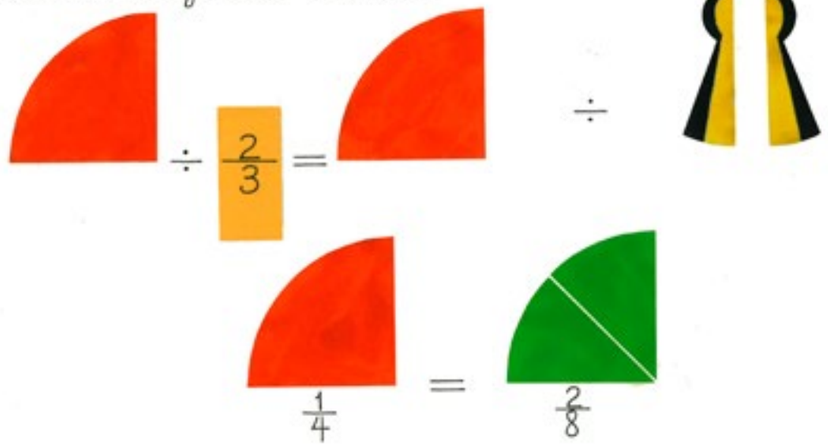
$\frac{2}{3} \div \frac{2}{9} =$ *means to make with the* $\frac{2}{3}$ *as many groups of* $\frac{2}{9}$ *as possible.*



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

So first the thirds must be divided into ninths. Then the ninths grouped into groups of two When this is done, we find that we have three groups of $\frac{2}{9}$. *3 then is the result of the division.*

Division of fraction by fraction: in dividing a fraction by a fraction, one must remember that the result of the division is indicated by the amount received by each unit of the divisor.



each third will receive one half of 7/4

As the unit is formed by 3 thirds, the result will be 3/8.

Rule: To divide a fraction by a fraction, one multiplies the first by the inverse of the second.

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