

Universal Active Math

ACTIVITIES AND WORKSHEETS

for teachers' workshops

FRACTIONS

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First Draft

We welcome your suggestions.

Please send your suggestions to navnirmitilearning@gmail.com

Universal Active Math :

Activities and Worksheets for Teachers' Workshops : Fractions

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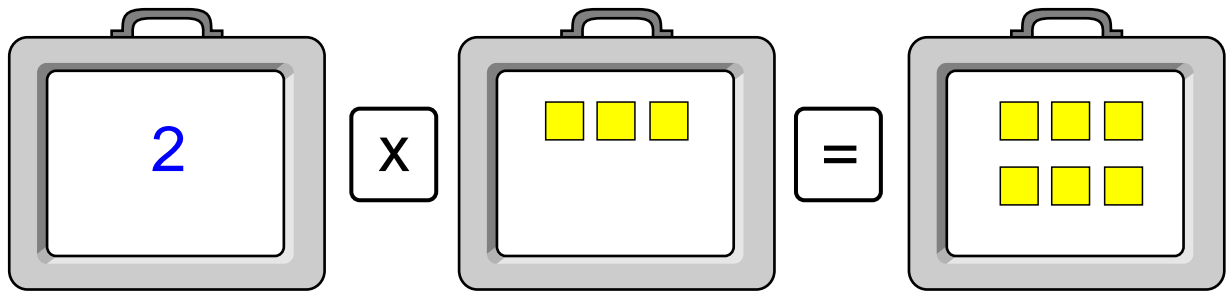
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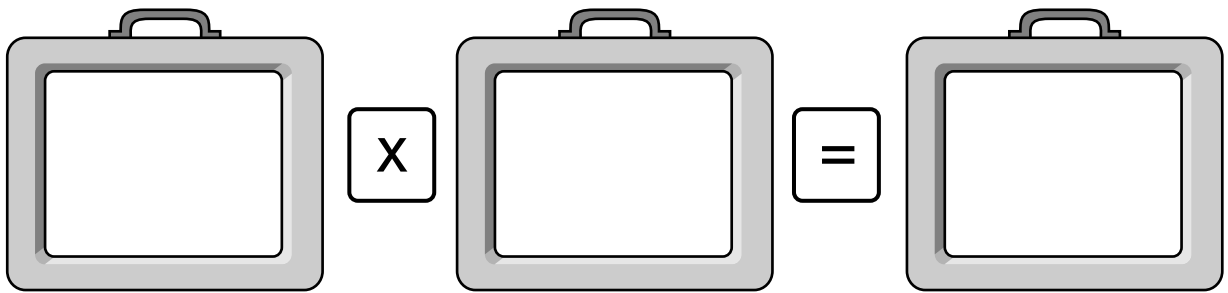
Representation of Multiplication using 3 slates

2×3 is '2 times 3'. The number 3 is to be taken 2 times.

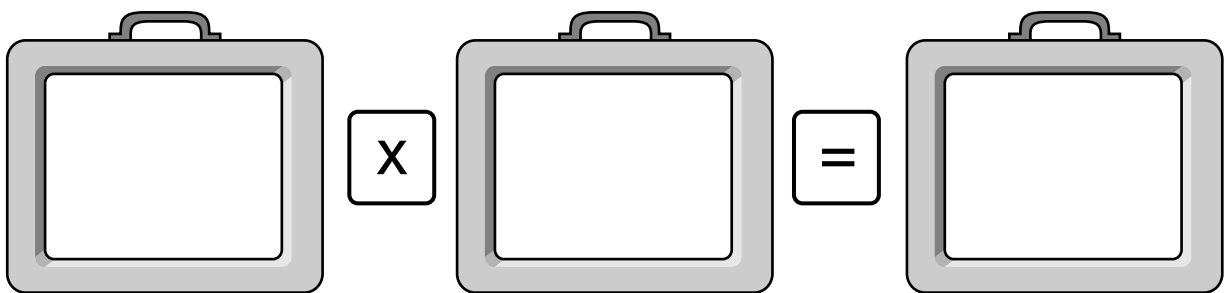


Arrange 3 slates on your table as shown above. Place the following multiplications using place value kit (rods and cubes) and draw the pictures here -

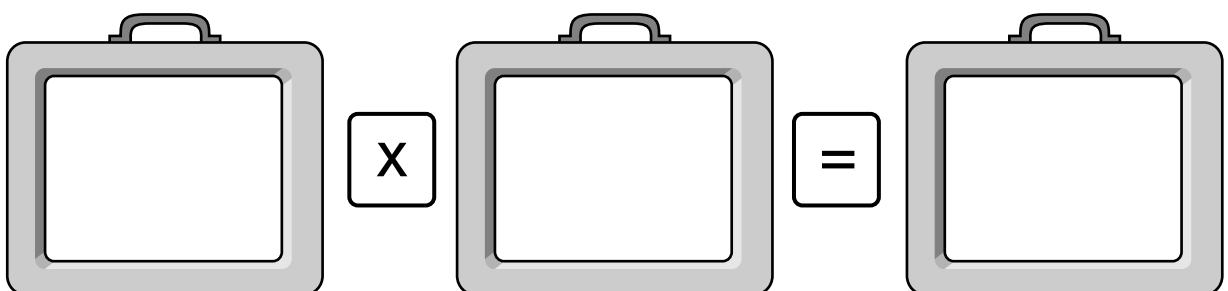
3×5



4×10



10×10



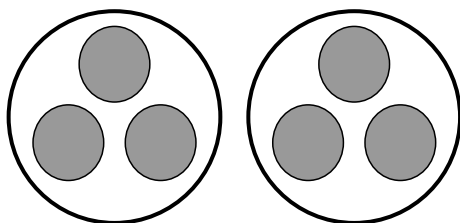
Meaning of division

Do the following :
6 divided by 2 : using paper 'rotis'.

Discuss how they did it.

First Method :

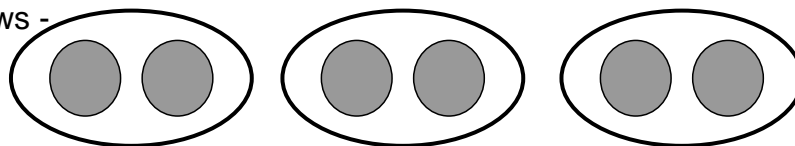
Priya did it as follows -



6 rotis divided into two equal parts.
Each part has 3 rotis.

Second Method :

Rehana did it as follows -



Portions of two rotis each. There are 3 portions.

Discuss : Which way is right?

Quickly answer - What is 100 divided by 2 ? How did you do it?
First method or second method?

What is 100 divided by 50 ? How did you do it?
First method or second method?

Discuss the Two Meanings of Division -

Example $6/2$

Meaning 1 - Equal sharing , Equal distribution.

Take 6 rotis, divide them equally among 2 children. How many rotis does each one get?

Meaning 2 - Equal grouping

Take 6 rotis, give 2 rotis to each child. How many children will get 2 rotis each?

Draw pictures two meanings of $8/2$:

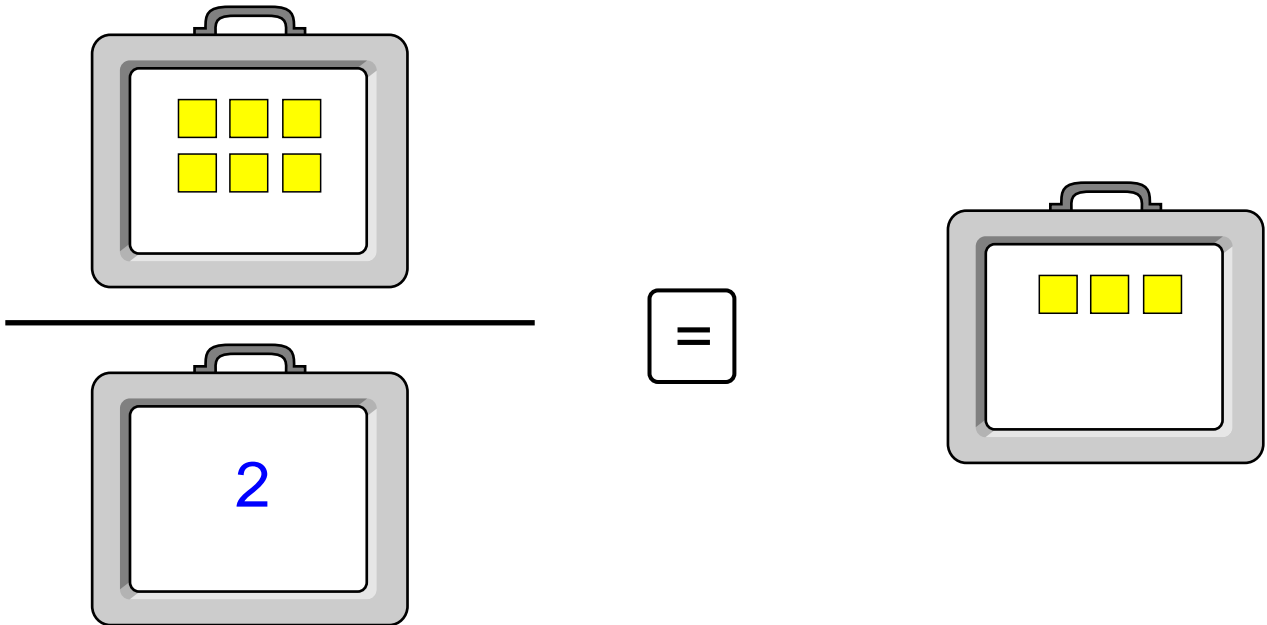
Meaning 1

Meaning 2

Division

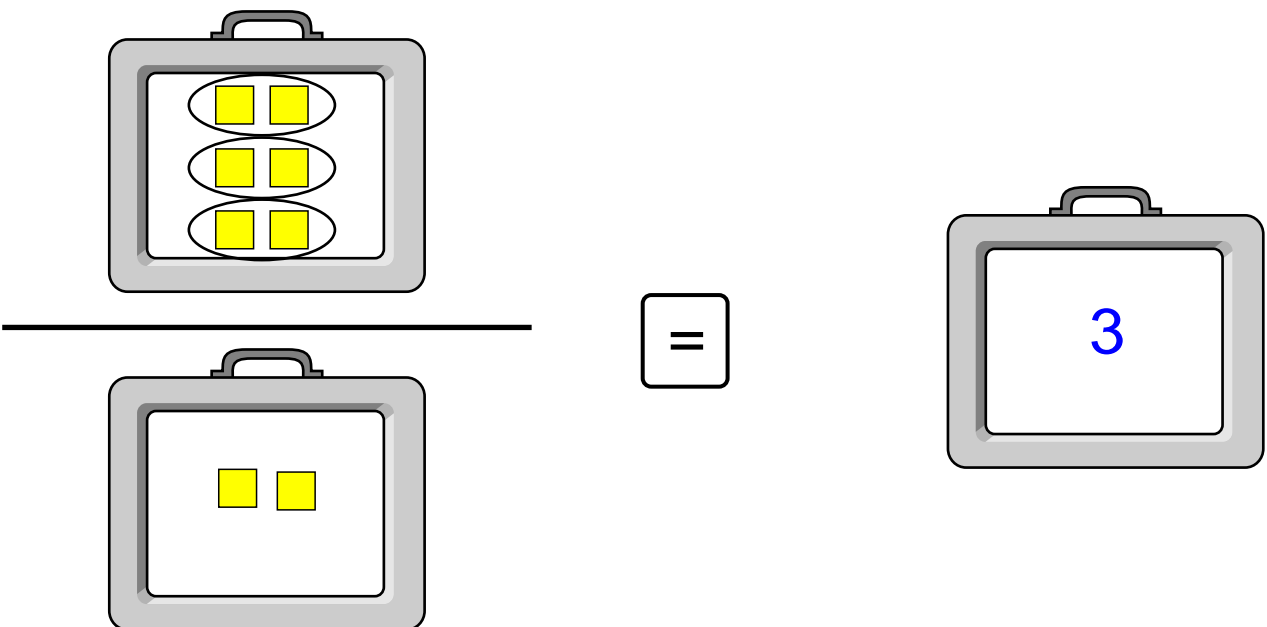
First meaning of Division - Making equal parts.

6/2 is dividing 6 cubes equally among two children and finding out how many each one got.



Second meaning of Division - Making portions.

6/2 is making portions of 2 cubes each from 6 cubes and finding out how many portions we could make.



Place the following divisions on 3 slates using both meanings (use place value kit)-

8/2,

8/4,

24/2,

24/12,

100/20,

100/5

Real life examples of two methods of division -

| First Method | Second Method |
|---|--|
| 15 chocolates to be divided equally among 3 children. Each one gets 5. | 15 chocolates, 3 to be given to each child. 5 children get 3 chocolates each. |
| 5 m i.e. 500 cm of string, to be divided equally among 5 children. Each one gets 100 cm. | 5 m i.e. 500 cm of string. Each child gets 5 cm. 100 children will get this amount of string. |
| 1 litre i.e. 1000 ml of milk to be divided among 5 children , each one gets 200 ml | Packets of 5 ml is not a practical example though that is the meaning of dividing 1000 by 5 in this case. |
| 2 kg i.e. 2000 g of rice is to be used to make khichadi for 20 children. Each one gets khichadi of 100 g of rice. | 2 kg i.e. 2000 g of rice is to be packed into packets of 20 g each, you will get 100 packets, again a non practical example. |

Write some more examples of two different methods of division -

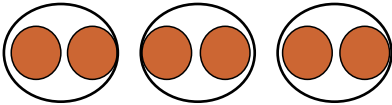
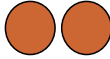
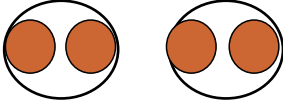


| | |
|--|--|
| | |
| | |
| | |

Divide using first meaning of division and fill in the blanks

$$\frac{\text{Briefcase with 4 circles}}{\text{Briefcase with 2}} = \text{Briefcase with 2 circles} \rightarrow \frac{4}{2} = 2$$

$$\frac{\text{Briefcase with 2 circles}}{\text{Briefcase with 2}} = \text{Empty briefcase} \rightarrow \frac{\square}{\square} = \square$$

$$\frac{\text{Briefcase with 1 circle}}{\text{Briefcase with 2}} = \text{Empty briefcase} \rightarrow \frac{\square}{\square} = \text{half}$$

| Division in Numerals | Picture of Division using first meaning | Number of Rotis | Divided equally among | Each one gets (picture and numeral) |
|----------------------|---|-----------------|-----------------------|---|
| $\frac{6}{3}$ |  | 6 | 3 |  2 |
| $\frac{8}{2}$ | | | | |
| |  | | | |
| | | 2 | 2 | |
| $\frac{2}{1}$ | | | | |
| $\frac{1}{2}$ |  | | |  $\frac{1}{2}$ |
| $\frac{1}{4}$ | | | | |
| $\frac{8}{4}$ | | | | |
| $\frac{4}{4}$ | | | | |
| $\frac{0}{4}$ | | | | |
| $\frac{3}{1}$ | | | | |
| $\frac{1}{3}$ | | | | |

DISCUSS - Fractions is not a new subject. It is only an example of division.

One Whole

When we are counting mangoes, our 'one' is a mango. Every 'one more' is also a mango.

When we are counting rotis, our 'one' is a roti. Every 'one more' is also a roti.

When we are counting books, our 'one' is a book. Every 'one more' is also a book.

What is half?

We can answer this question in concrete only if we know what is one whole.

Fractions with paper cutting-

Take a page of an old magazine (or of a news paper) as one whole.

Make and cut pieces showing the following fractions.

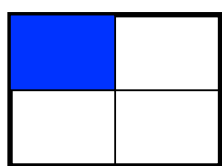
Arrange these pieces in ascending order of their size.

Discuss smaller, bigger, smallest and biggest.

$$\frac{1}{2} \quad \frac{1}{4} \quad \frac{1}{8} \quad \frac{1}{16} \quad \frac{1}{3} \quad \frac{1}{6} \quad \frac{1}{12} \quad \frac{1}{9} \quad \frac{1}{18}$$

The smallest fraction is and the largest fraction is

Colour the given fractions -



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



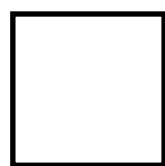
$$\frac{1}{3}$$



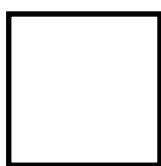
$$\frac{1}{6}$$



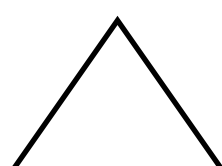
$$\frac{1}{8}$$



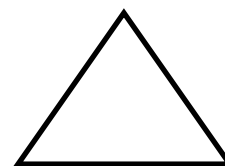
$$\frac{1}{9}$$



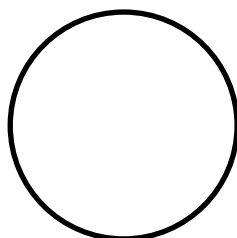
$$\frac{1}{16}$$



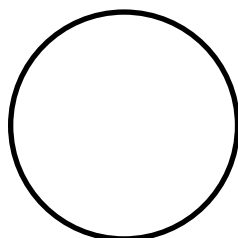
$$\frac{1}{3}$$



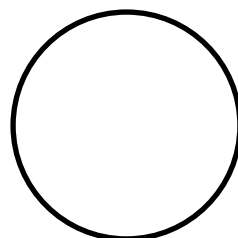
$$\frac{1}{4}$$



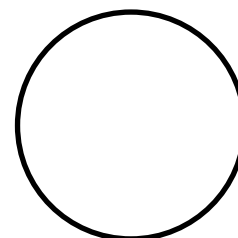
$$\frac{1}{2}$$




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

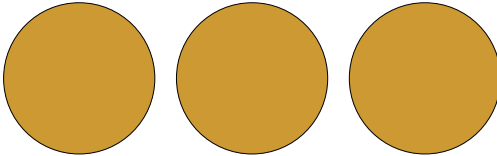


$$\frac{1}{3}$$

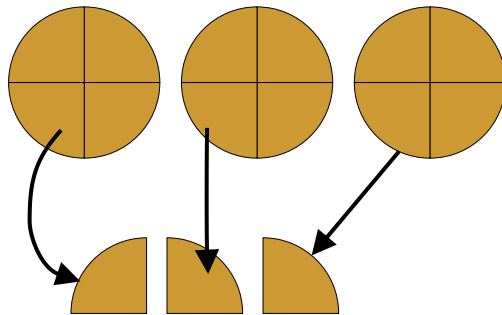


$$\frac{1}{6}$$

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


$$3 \div 4 \rightarrow$$


3 rotis are to be divided equally among 4 persons.



We make 4 parts of each roti and give one part to each person.

Each person gets 3 pieces of $\frac{1}{4}$

Therefore,

$$3 \div 4 \text{ or } \frac{3}{4} = 3 \times \frac{1}{4}$$

Write in the form of fractions

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

$$3 \times \frac{1}{3} \longrightarrow \square$$

$$5 \times \frac{1}{6} \longrightarrow \square$$

$$7 \times \frac{1}{5} \longrightarrow \square$$

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

Revise -

$\frac{2}{3}$ = Two by three = rotis divided equally among children.

Draw two rotis and divide.

Draw the parts that each one got.

Describe the pieces that each one got - 2 pieces of $\frac{1}{3}$ OR $\frac{1}{3} + \frac{1}{3}$

$\frac{3}{4}$ = Three by four = rotis divided equally among children.

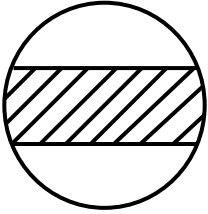
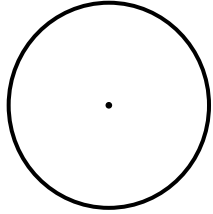
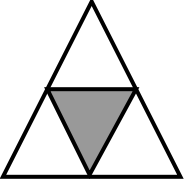
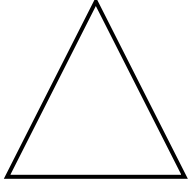
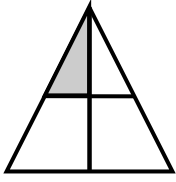
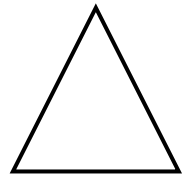
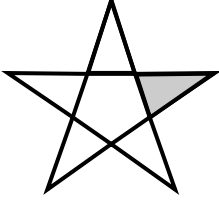
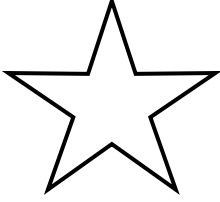
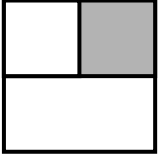
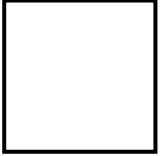
Draw three rotis and divide.

Draw the parts that each one got.

Describe the pieces that each one got -



| | | | |
|---|---------------------------|------------------------|---------------|
| $\frac{1}{4} + \frac{1}{4} + \frac{1}{4}$ | 3 pieces of $\frac{1}{4}$ | $3 \times \frac{1}{4}$ | $\frac{3}{4}$ |
| | 4 pieces of $\frac{1}{5}$ | | |
| $\frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3}$ | | | |
| | | $2 \times \frac{1}{6}$ | |
| | | | $\frac{5}{7}$ |
| | | | $\frac{7}{5}$ |


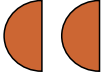
Here are some fractions coloured by children. Check them. Write the reason if it's wrong. Colour the fraction correctly.

| Fractions coloured by children | Right / Wrong? Reason? | Fractions coloured correctly |
|---|---------------------------|---|
| $\frac{1}{3}$  | <hr/> <hr/> <hr/> <hr/> |  |
| $\frac{1}{4}$  | <hr/> <hr/> <hr/> <hr/> |  |
| $\frac{1}{4}$  | <hr/> <hr/> <hr/> <hr/> |  |
| $\frac{1}{5}$  | <hr/> <hr/> <hr/> <hr/> |  |
| $\frac{1}{3}$  | <hr/> <hr/> <hr/> <hr/> |  |



A geometrical challenge -

There is a triangular cake. It is to be distributed equally among four children. In how many ways can you do it? (All four parts need not look identical but each one should get the same amount of cake). Draw your solutions here :

If we divide  equally among two children, each one gets  which is written as $\frac{1}{2}$

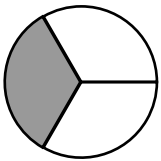
If we take two pieces like this () we have 

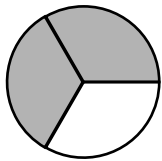
$$\frac{1}{2} + \frac{1}{2} = \text{two times } \frac{1}{2} = 2 \times \frac{1}{2} = \frac{2}{2}$$

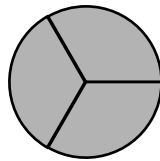
 taken 3 time is 

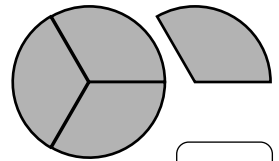
$$\frac{1}{2} + \frac{1}{2} + \frac{1}{2} = \text{three times } \frac{1}{2} = 3 \times \frac{1}{2} = \frac{3}{2}$$

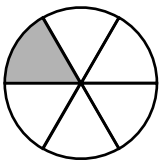
Write the coloured fractions in numerals

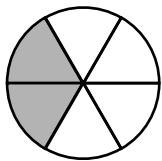


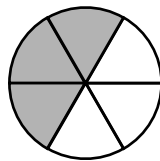


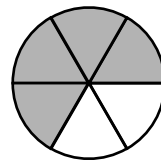


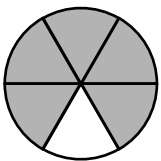


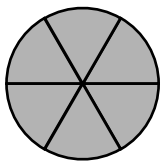


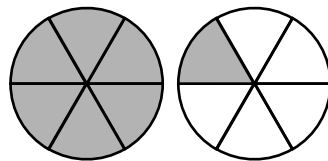


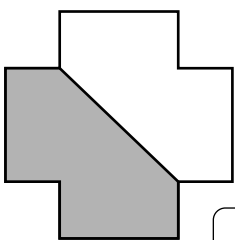


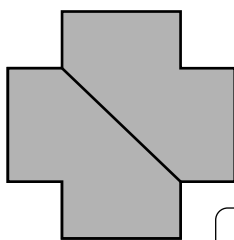


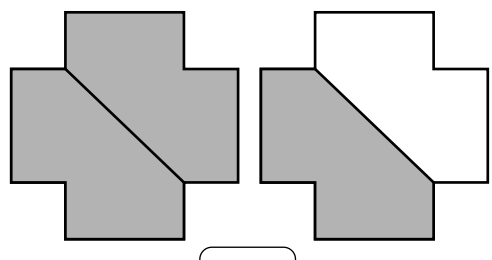












Search for the pieces corresponding to following fractions in fraction kit.

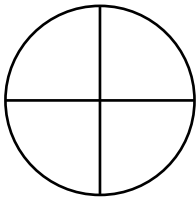
Write in various forms.

While counting using a fraction as a unit, all pieces have to be of the same value.

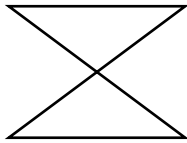
| In form of addition | Description | Unit of counting | Number of pieces | In form of multiplication | Fraction |
|---|---------------------------|------------------|------------------|---------------------------|----------------|
| $\frac{1}{4} + \frac{1}{4} + \frac{1}{4}$ | 3 pieces of $\frac{1}{4}$ | $\frac{1}{4}$ | 3 | $3 \times \frac{1}{4}$ | $\frac{3}{4}$ |
| | 4 pieces of $\frac{1}{6}$ | | | | |
| $\frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3}$ | | | | | |
| $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$ | | | | | |
| | | | | | $\frac{6}{8}$ |
| | | | | | $\frac{8}{16}$ |
| $\frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$ | | | | | |
| | | $\frac{1}{9}$ | 2 | | |
| | | $\frac{1}{16}$ | 5 | | |
| | | | | $4 \times \frac{1}{3}$ | |
| | | | | | $\frac{3}{4}$ |
| | | | | | $\frac{8}{4}$ |

Colour the given fractions

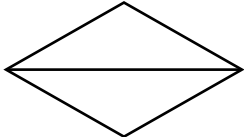
$\frac{1}{4}$



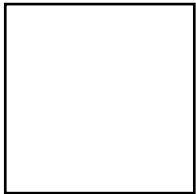
$\frac{1}{2}$



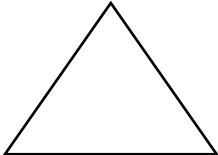
$\frac{2}{2}$



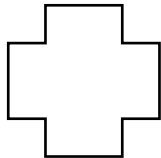
$\frac{2}{3}$



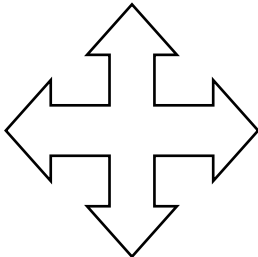
$\frac{1}{4}$



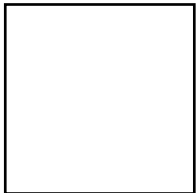
$\frac{3}{4}$



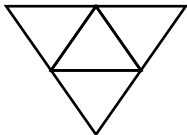
$\frac{1}{2}$



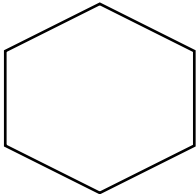
$\frac{5}{6}$



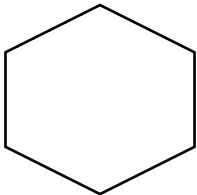
$\frac{3}{4}$



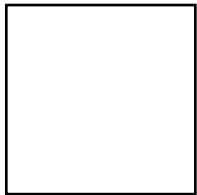
$\frac{1}{6}$



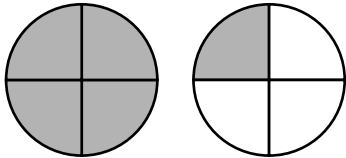
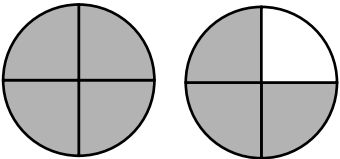
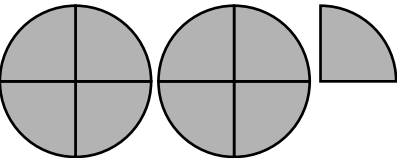
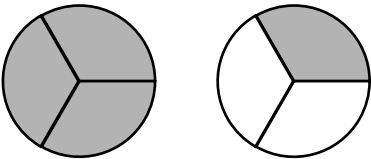
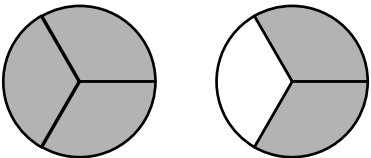
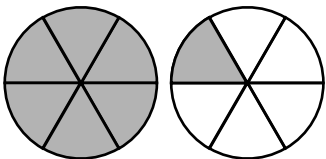
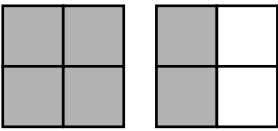
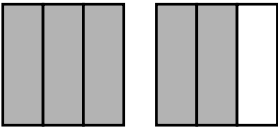
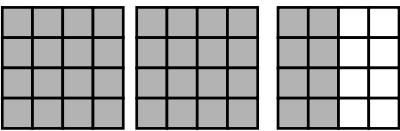
$\frac{1}{3}$



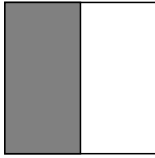
$\frac{1}{8}$



Fractions greater than 1

| Fraction | Unit of counting | Number of pieces | Fraction in numerals | In form of multiplication | In form of addition | In form of mixed addition |
|---|------------------|------------------|----------------------|---------------------------|---|---------------------------|
|  | $\frac{1}{4}$ | 5 | $\frac{5}{4}$ | $5 \times \frac{1}{4}$ | $(\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}) + \frac{1}{4}$ | $1 \frac{1}{4}$ |
|  | | | | | | |
|  | $\frac{1}{4}$ | 9 | $\frac{9}{4}$ | $9 \times \frac{1}{4}$ | $(\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}) + (\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}) + \frac{1}{4}$ | $2 \frac{1}{4}$ |
|  | | | | | | |
|  | | | | | | |
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Food for thought



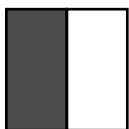
Coloured part is half of the whole square.



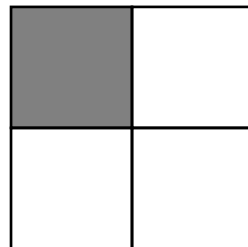
Coloured part is half of the whole rectangle.

The value of both these parts is $\frac{1}{2}$, which means the value is equal, but one part is bigger and the other is smaller. Why is it so?

A child was thinking about fractions -



This is a half .



and this is a quarter.

Which one is bigger, a half or a quarter? When I eat rotis half roti is bigger than quarter roti. But here, a quarter is looking bigger. What do you think? What is bigger, a half or a quarter?

Equivalent Fractions

Use fraction kit to do the following activity.

If the fraction kit is not available, news paper pieces can be used for this activity.

Take a page of magazine as one whole. Take many such pieces.

Make two equal parts of one of these. This is a piece of $\frac{1}{2}$. You have two pieces of $\frac{1}{2}$.

Make 4 equal parts of another page. Each of these pieces is $\frac{1}{4}$. You have 4 pieces of $\frac{1}{4}$.

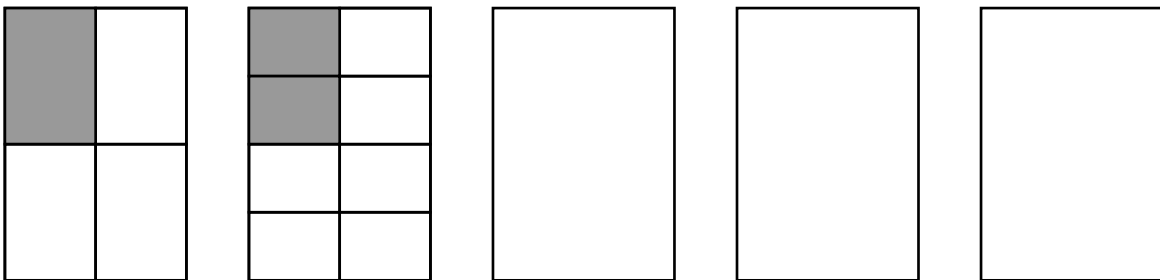
Similarly make pieces of $\frac{1}{6}$, $\frac{1}{8}$, $\frac{1}{12}$, $\frac{1}{16}$, $\frac{1}{24}$ etc.

The fraction kit has all these pieces.

Now take a piece of $\frac{1}{2}$. Using smaller pieces make $\frac{1}{2}$. All pieces should be identical to each other. E. g. 2 pieces of $\frac{1}{4}$. Search for all possible ways of making $\frac{1}{2}$ and fill in the blank boxes :

$$\frac{1}{2} = \frac{\boxed{2}}{4} = \frac{\boxed{}}{6} = \frac{\boxed{}}{8} = \frac{\boxed{}}{12} = \frac{\boxed{}}{16} = \frac{\boxed{}}{24}$$

Colour $\frac{1}{4}$ of this biscuit in many different ways. Fill in the blanks as per what you have coloured.



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

Observe the equivalent fractions that you got above for $\frac{1}{2}$ and $\frac{1}{4}$.

What rule do you see to get equivalent fractions?

Apply your rule and write the equivalent fractions for $\frac{1}{3}$ and $\frac{1}{5}$

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

$$\frac{1}{5} = \frac{\boxed{}}{\boxed{}} = \frac{\boxed{}}{\boxed{}} = \frac{\boxed{}}{\boxed{}} = \frac{\boxed{}}{\boxed{}} = \frac{\boxed{}}{\boxed{}} = \frac{\boxed{}}{\boxed{}}$$

Fractions using a string and clamps

Stretch and tie a string of about 4-5 meters as shown in the picture.
Put two clamps at two ends of the straight line made by the string.
This distance is 1 whole.

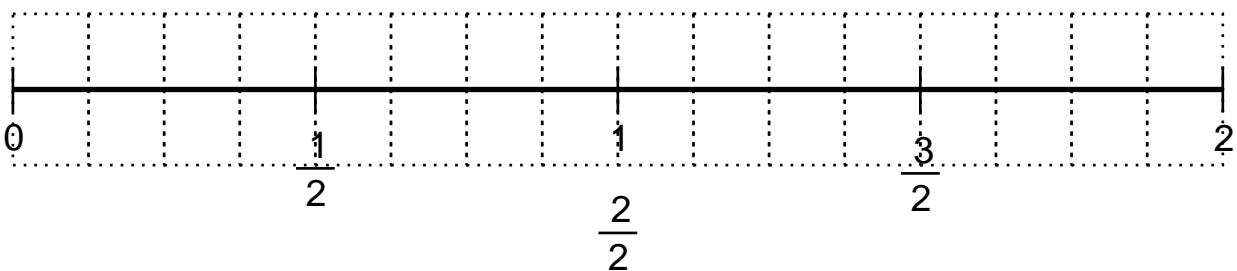


Divide this one whole into parts. Show the following fractions on the string using clamps.
Observe which fractions lie on the same point. Write equivalent fractions.

$$\frac{1}{2} \quad \frac{2}{2} \quad \frac{1}{3} \quad \frac{2}{3} \quad \frac{3}{3} \quad \frac{1}{4} \quad \frac{2}{4} \quad \frac{3}{4} \quad \frac{4}{4} \quad \frac{1}{6} \quad \frac{2}{6} \quad \frac{3}{6} \quad \frac{4}{6} \quad \frac{5}{6} \quad \frac{6}{6}$$

Show the following fractions on the line segment below.

$$\frac{1}{2} \quad \frac{2}{2} \quad \frac{3}{2} \quad \frac{4}{2} \quad \frac{1}{4} \quad \frac{2}{4} \quad \frac{3}{4} \quad \frac{4}{4} \quad \frac{5}{4} \quad \frac{6}{4} \quad \frac{7}{4} \quad \frac{8}{4} \quad \frac{1}{8} \quad \frac{2}{8} \quad \frac{4}{8} \quad \frac{8}{8} \quad \frac{12}{8} \quad \frac{16}{8}$$




Which fractions lie on the point of $\frac{3}{2}$?


Which fractions are equivalent to $\frac{2}{4}$?

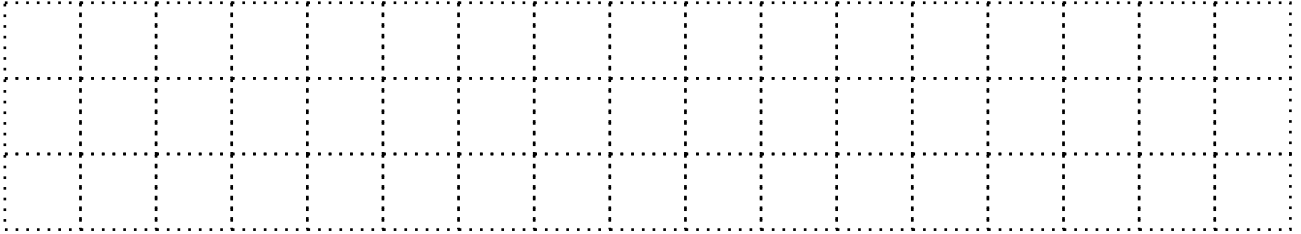
Which fractions do you see at the position of 1 ?

Which fractions do you see at the position of 2 ?

Do the following activity using Jodo Blocks -

One whole chocolate is of this size : 

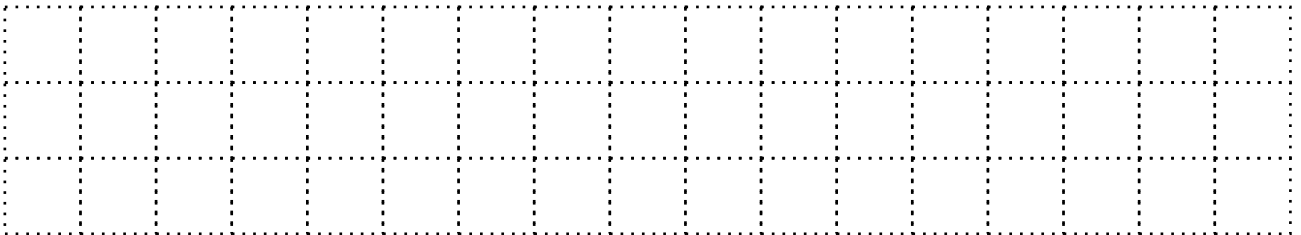
The unit of counting is  i.e. $1/4$. Make and colour the following fractions using this $1/4$ as counting unit : $1/4, 2/4, 3/4, 4/4, 5/4, 6/4, 7/4, 8/4$




Make and colour $1/2, 2/2, 3/2, 4/2$ of this chocolate -



Unit of counting will be $1/2$ which is



If one whole is  , write the following fractions in numerals -















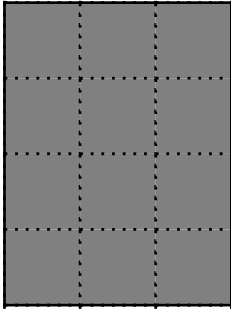




One whole chocolate slab is shown in the picture. Colour the following fractions :

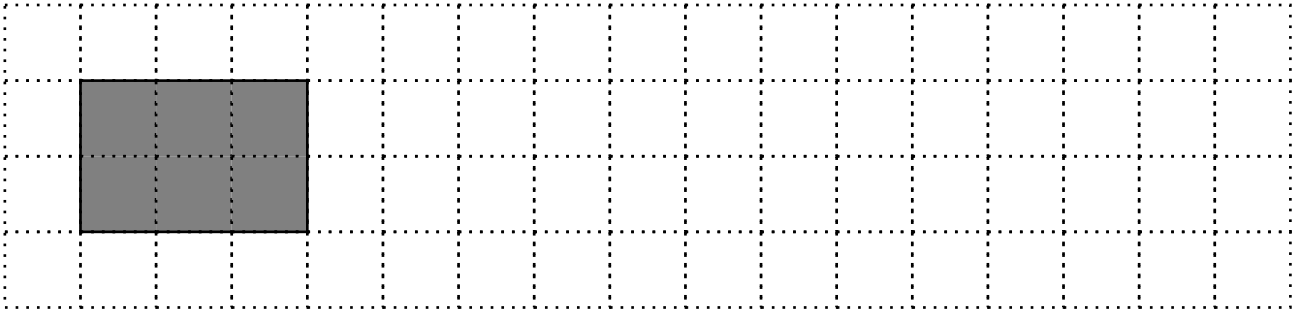
$\frac{1}{2}$, $\frac{2}{2}$, $\frac{3}{2}$, $\frac{1}{3}$, $\frac{2}{3}$, $\frac{3}{3}$, $\frac{4}{3}$, $\frac{1}{6}$, $\frac{2}{6}$, $\frac{3}{6}$, $\frac{4}{6}$, $\frac{5}{6}$, $\frac{6}{6}$,

$\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, $\frac{4}{4}$, $\frac{5}{4}$, $\frac{6}{4}$

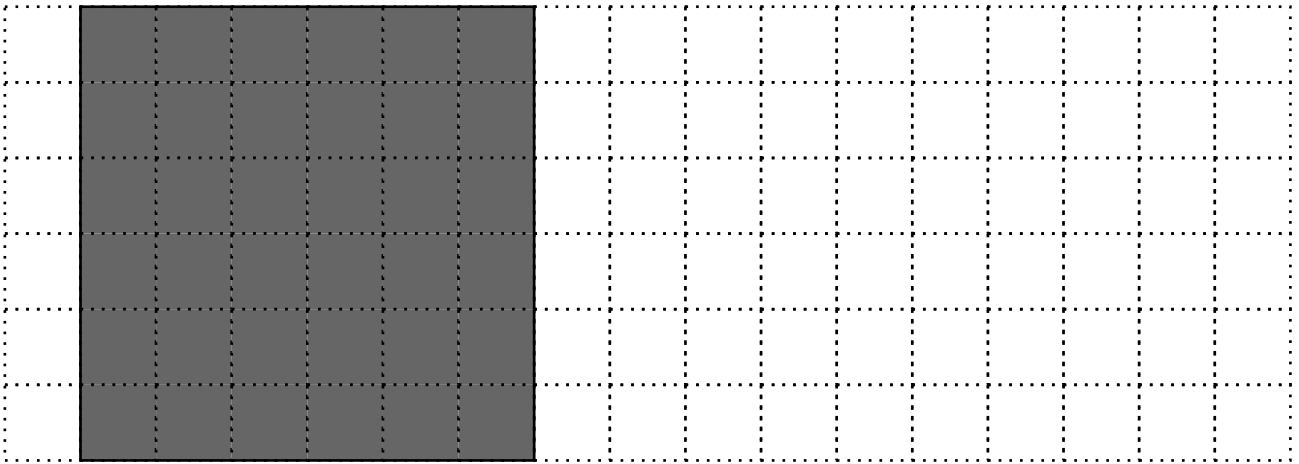


1 whole

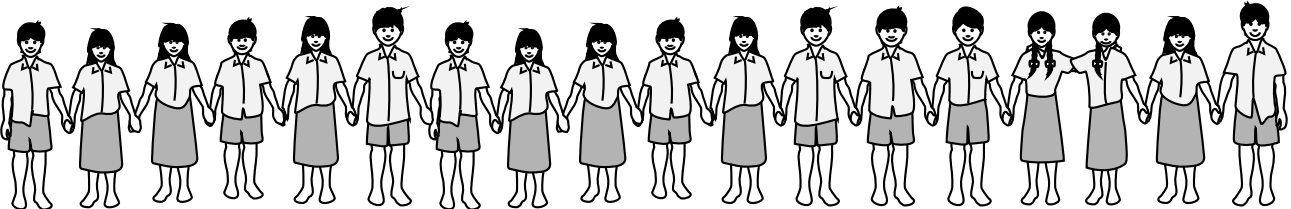
Coloured piece is $\frac{2}{3}$ of a full chocolate slab. Colour the whole chocolate slab.
 Also colour $\frac{1}{3}$ chocolate.



This is one whole chocolate slab. Colour separately $\frac{5}{9}$.




A group of children -



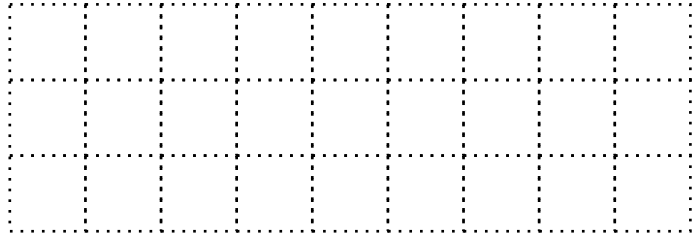
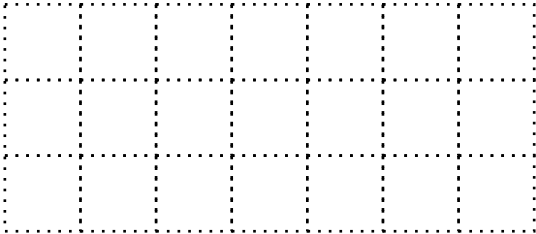
| Part | Number of children |
|---------------|--------------------|
| Whole group | |
| $\frac{1}{9}$ | |
| | 4 |
| | 12 |
| $\frac{1}{6}$ | |
| | 1 |

Do the following activity using jodo blocks and make pictures :

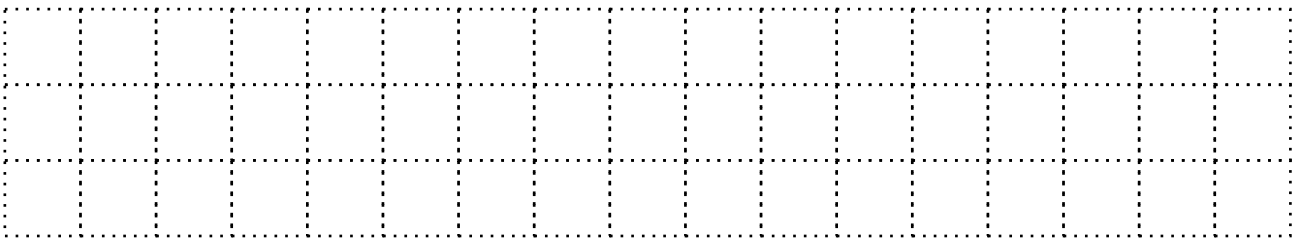
- If one whole is made of 4 blocks like this  , we can make two equal parts and 4 equal parts. But we cannot make 3 equal parts of this whole.

Make and colour a whole of which we can make 2 equal parts.

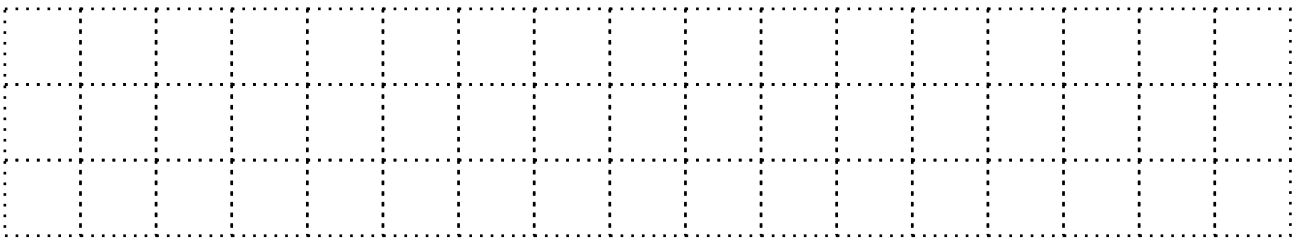
Make and colour a whole of which we can make 3 equal parts.



Make and colour a whole of which we can make 2 equal parts and 3 equal parts.





















Make and colour a whole of which we can make 2, 3 and 4 equal parts.











Write the values of these fractions if they are parts of the whole made of 12 blocks -

Keeping in mind the whole and also the unit of counting, write the fractions

| | | |
|---|-------------------|--|
|  | 1 whole | Unit of counting = $\frac{1}{4}$  |
|  | $\frac{2}{4}$ | |
|  | $\frac{3}{4}$ | |
|  | $\frac{4}{4} = 1$ | |
|  | 1 whole | Unit of counting = $\frac{1}{2}$  |
|  | | |
|  | | |
|  | 1 whole | Unit of counting = $\frac{1}{3}$  |
|  | | |
|  | | |
|  | 1 whole | Unit of counting = $\frac{1}{6}$  |
|  | | |
|  | | |
|  | | |





Observe the pictures of Jodo Blocks and write the addition and answer





| | | |
|---|---|----------------------------------|
|  | 1 whole | Unit of counting = $\frac{1}{5}$ |
|  | $\frac{2}{5}$ | |
|  | $\frac{1}{5}$ | |
|  | $\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$ | |


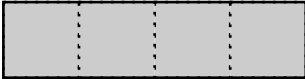

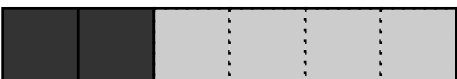
| | | |
|---|---------|----------------------------------|
|  | 1 whole | Unit of counting = $\frac{1}{4}$ |
|  | | |
|  | | |
|  | | |

| | | |
|---|---------|----------------------------------|
|  | 1 whole | Unit of counting = $\frac{1}{4}$ |
|  | | |
|  | | |
|  | | |

Observe the pictures of Jodo Blocks and write the addition and answer

| | |
|---|---|
|  | 1 whole |
|  | $\frac{1}{2}$ |
|  | $\frac{1}{4}$ |
|  | $\frac{1}{2} + \frac{1}{4} = \frac{3}{4}$ |

| | |
|---|---------|
|  | 1 whole |
|  | |
|  | |
|  | |

| | |
|---|---------|
|  | 1 whole |
|  | |
|  | |
|  | |

$1/2 + 1/3 = ?$

For solving this, take a whole made of jodo blocks of which we can make 2 equal parts as well as 3 equal parts. Take the smallest whole possible.

Colour the parts and colour and write the the addition.

1 whole =

| | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

$1/2 =$

| | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

$1/3 =$

| | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

$1/2 + 1/3 =$

| | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

Answer in numerals =

$2/5 + 1/3 = ?$

For solving this, take a whole made of jodo blocks of which we can make 5 equal parts as well as 3 equal parts. Take the smallest whole possible.

Colour the parts and colour and write the the addition.

1 whole =

| | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

$2/5 =$

| | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

$1/3 =$

| | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|


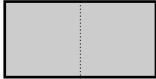



Addition =

| | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|


Answer in numerals =

Use jodo blocks to do the additions and fill in the blanks.

$$\frac{1}{2} + \frac{1}{4} \rightarrow$$

| | |
|---|-----------------------------|
|  | 1 whole is chosen |
|  | $\frac{1}{2}$ |
|  | $\frac{1}{4}$ |
|  | $\frac{1}{2} + \frac{1}{4}$ |
|  | $\frac{3}{4}$ |

$$\frac{1}{2} + \frac{3}{4} \rightarrow$$

| | |
|---|-----------------------------|
|  | 1 |
| | $\frac{1}{2}$ |
| | $\frac{3}{4}$ |
| | $\frac{1}{2} + \frac{3}{4}$ |
| | |

Use jodo blocks to do the additions and fill in the blanks.

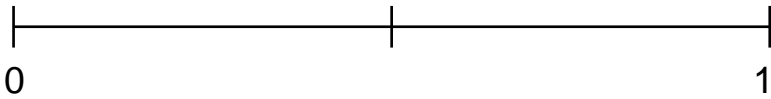
$$\frac{1}{5} + \frac{1}{3} \rightarrow$$

| | |
|--|--|
| | |
| | |
| | |
| | |
| | |

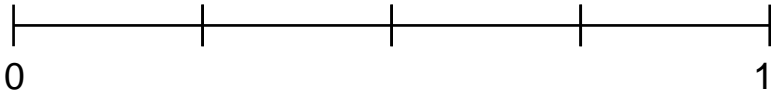
$$\frac{1}{2} + \frac{2}{5} \rightarrow$$

| | |
|--|--|
| | |
| | |
| | |
| | |
| | |

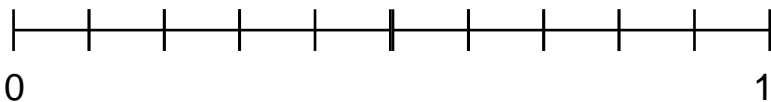
Observe the parts and make 1 by addition



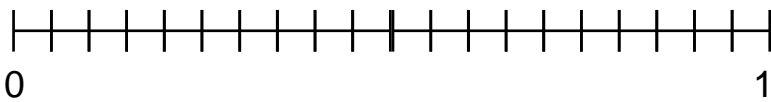
$$\frac{1}{2} + \boxed{} = 1$$



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



$$\frac{3}{10} + \boxed{} = 1$$



$$\frac{16}{20} + \boxed{} = 1$$

If half ($\frac{1}{2}$) of some work is done, how much work is remaining?

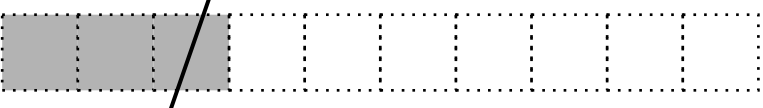
Half of the class of 40 are girls. How many boys are there in the class?

There is rice sown in $\frac{3}{4}$ of a farm plot. How much of the plot is left for vegetables?

Subtract : $\frac{3}{5} - \frac{1}{5}$

Choose one whole. Colour it - 

Colour $\frac{3}{5}$ of it - 

Cross out $\frac{1}{5}$ to show cancellation- 

Colour the remaining part - 

Answer in numerals = $\frac{2}{5}$

Subtract : $5/7 - 2/7$

Choose 1. Colour it -

| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|

Colour $5/7$ of it -

| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|

Cross $2/7$ -

| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|

Colour the remaining part -

| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|

Answer in numerals =

Subtract : $7/10 - 1/5$

Choose 1. Colour it -

| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|

Colour $7/10$ of it -

| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|

Cross $1/5$ -

| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|

Colour the remaining part -

| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|

Answer in numerals =

Subtract : $3/2 - 1/4$

Choose 1. Colour it -

| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|

Colour $3/2$ of it -

| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|

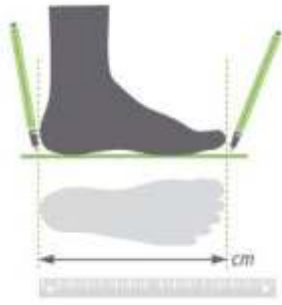
Cross $1/4$ -

| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|

Colour the remaining part -

| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|

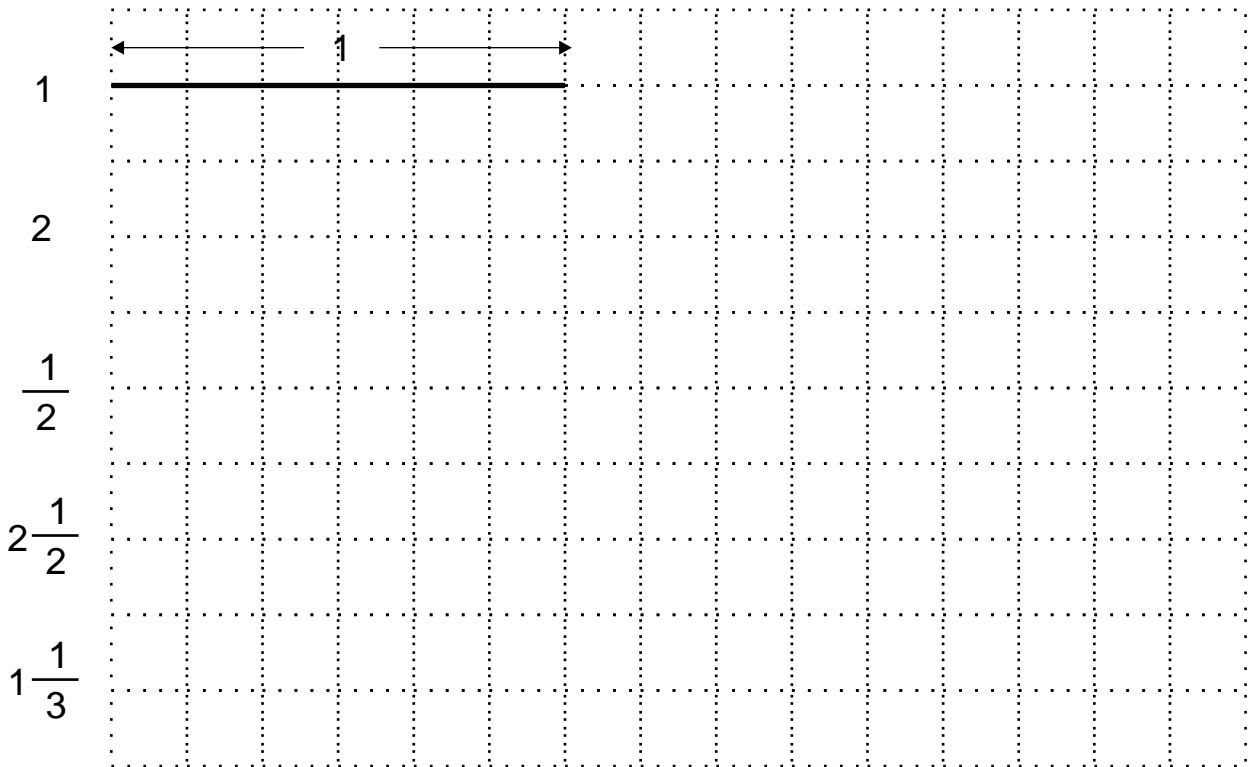
Answer in numerals =



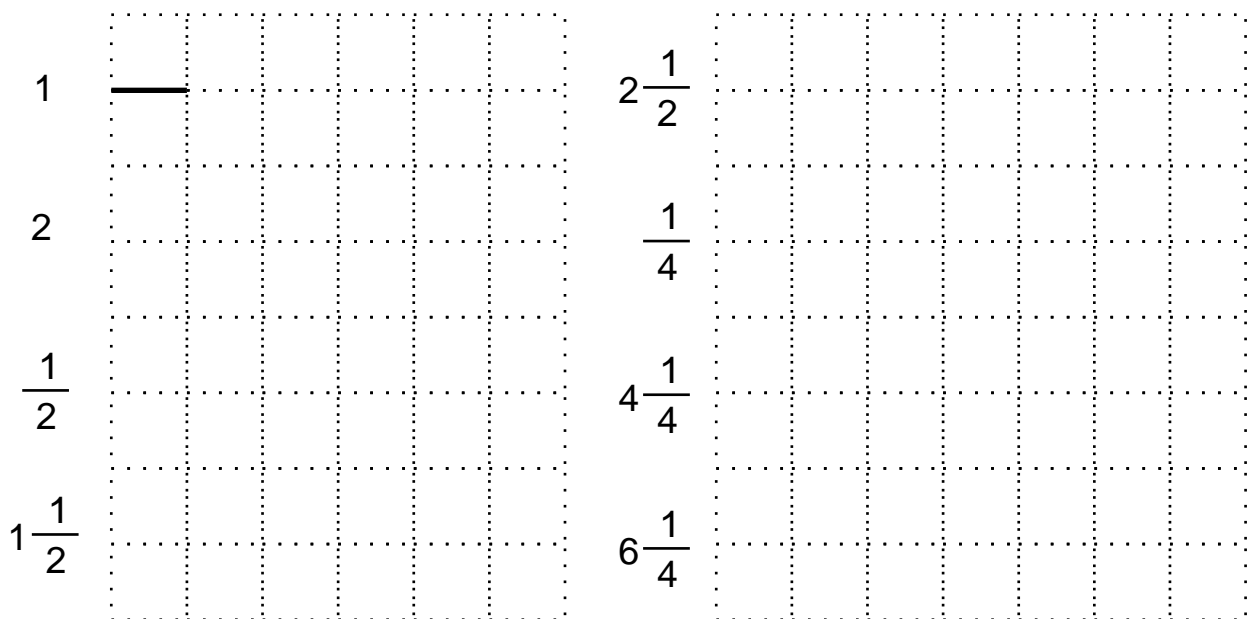
The length of one foot was measured.

It is shown on the grid below as 1 whole length.

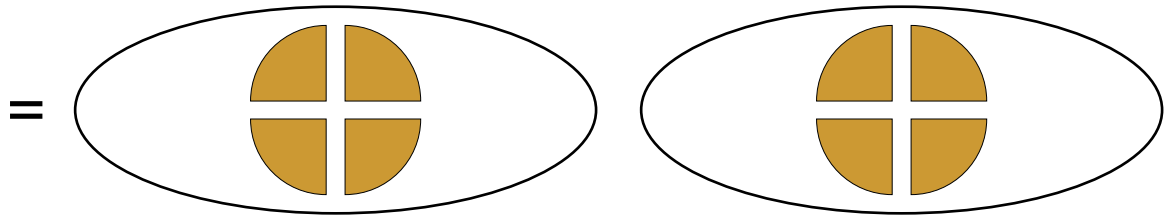
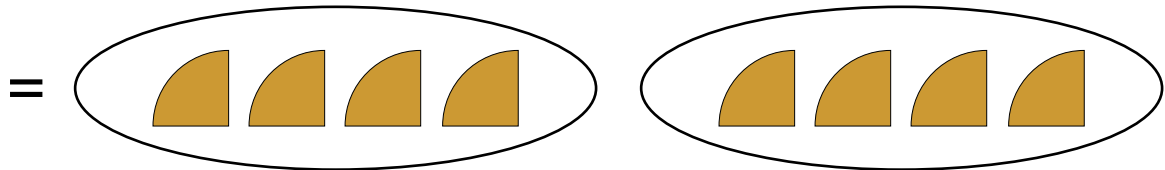
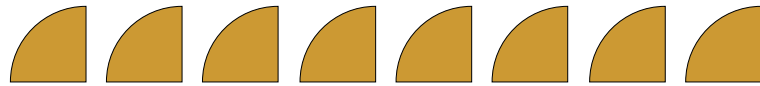
Draw line segments showing all other lengths.



Draw line segments of the following lengths in cm.



$$8 \times \frac{1}{4}$$



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

4 pieces of $\frac{1}{4}$ make a whole roti.

Therefore 4 times $\frac{1}{4}$ is 1.

We can thus cancel a 4 in numerator with a 4 in denominator.

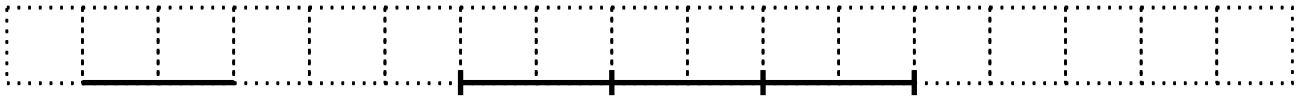
$$= 2$$

$$\frac{2}{\cancel{3}} \times \cancel{3} = \frac{1}{\cancel{3}} \times 2 \times \cancel{3} \quad \text{OR} \quad \frac{2}{\cancel{3}} \times \cancel{3} = 2$$

Solve -

| | |
|-----------------------------------|----------------------------------|
| $\frac{2}{6} \times 6 = \square$ | $\frac{2}{8} \times 4 = \square$ |
| $\frac{1}{5} \times 10 = \square$ | $\frac{3}{6} \times 8 = \square$ |
| $\frac{1}{9} \times 3 = \square$ | $\frac{3}{9} \times 6 = \square$ |

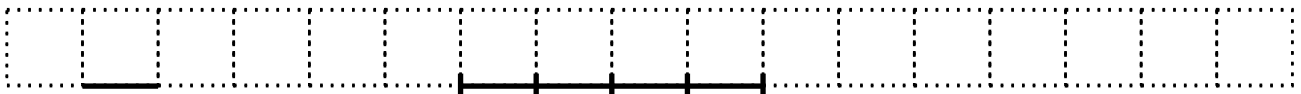
3 x 2 in length :



A segment of 2 cm

$3 \times (2 \text{ cm}) \rightarrow$ a segment of 6 cm

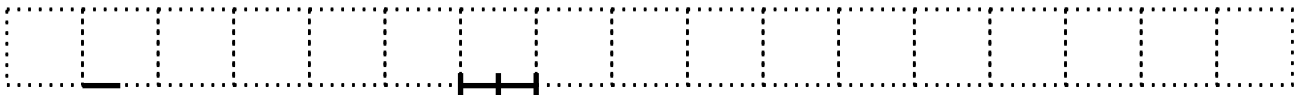
4 x 1 in length :



A segment of 1 cm

$4 \times (1 \text{ cm}) \rightarrow$ a segment of 4 cm

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



A segment of $\frac{1}{2}$ cm

$2 \times (\frac{1}{2} \text{ cm}) \rightarrow$ a segment of 1 cm

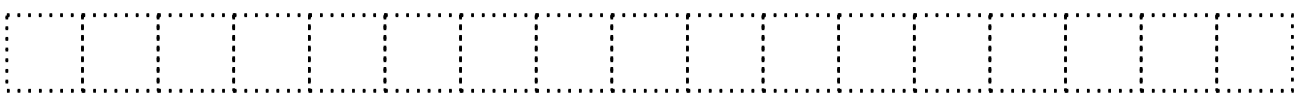
$4 \times \frac{1}{2}$



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



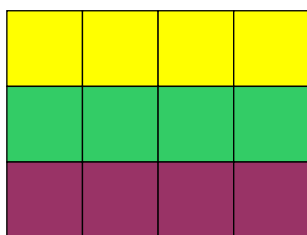
$4 \times 2\frac{1}{2}$



Colour the given multiplications.

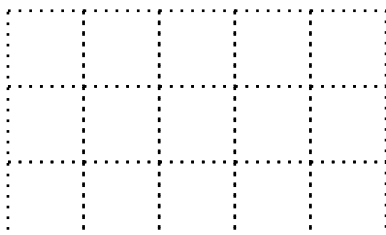
Write the length and breadth of each rectangle and write the answer.

$$4 \times 3$$



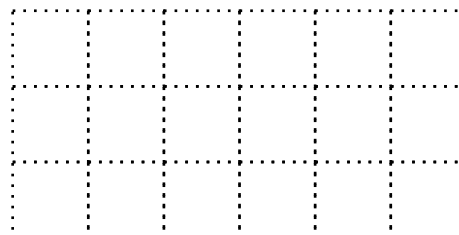
length = 4
breadth = 3
Multiplication
= No. of squares
= 12

$$4 \times 2$$



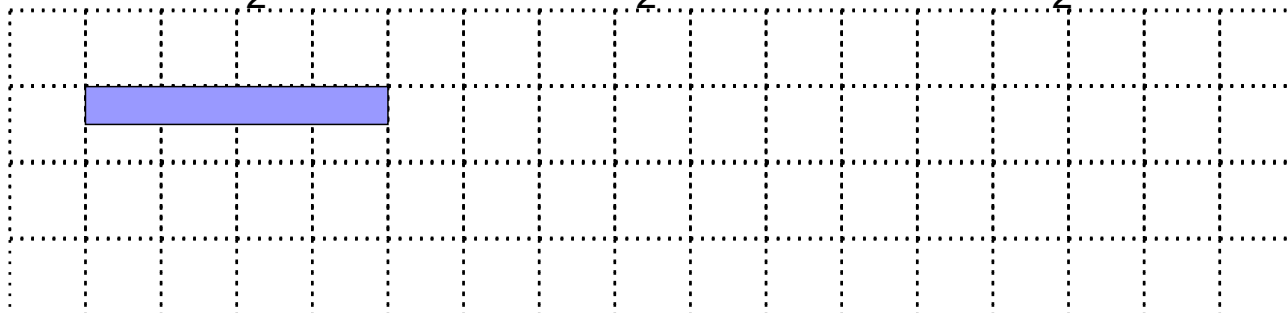
length =
breadth =
Multiplication
= No. of squares
=

$$4 \times 1$$



length =
breadth =
Multiplication
= No. of squares
=

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



length =
breadth =
Multiplication
= No. of squares
=

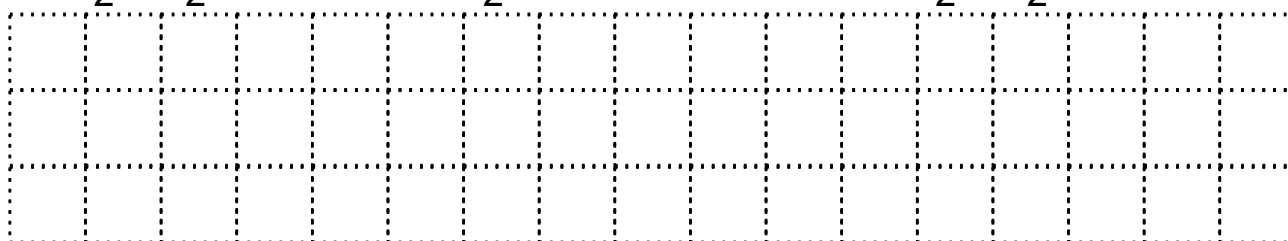
$$\frac{1}{2} \times 2$$

length =
breadth =
Multiplication
= No. of squares
=

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

length =
breadth =
Multiplication
= No. of squares
=

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



length =
breadth =
Multiplication
= No. of squares
=

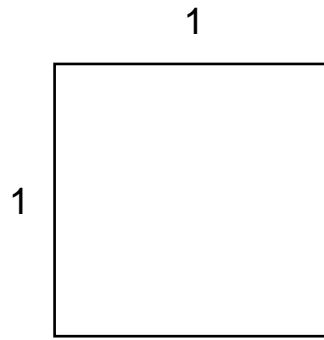
$$\frac{3}{2} \times 2$$

length =
breadth =
Multiplication
= No. of squares
=

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

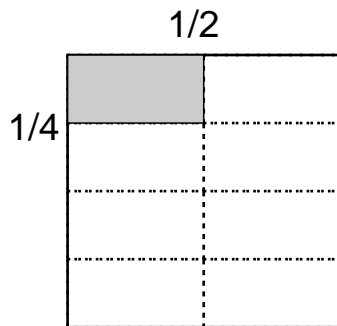
length =
breadth =
Multiplication
= No. of squares
=

1×1



$= \boxed{1}$

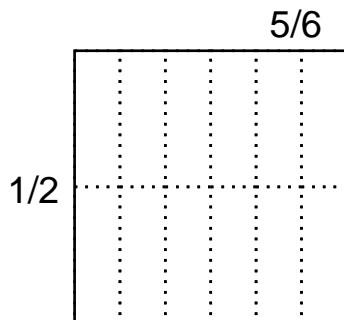
$1/2 \times 1/4$



2 divisions in length
 4 divisions in breadth
 Total 8 parts in the whole
 1 part of that type

$= \boxed{1/8}$

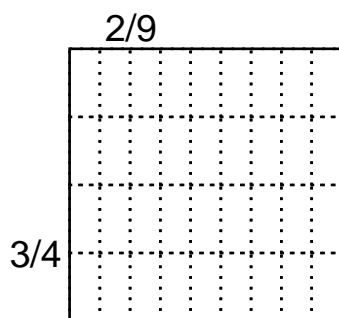
$5/6 \times 1/2$



..... divisions in length
 divisions in breadth
 Total parts in the whole
parts of that type

$= \boxed{}$

$2/9 \times 3/4$

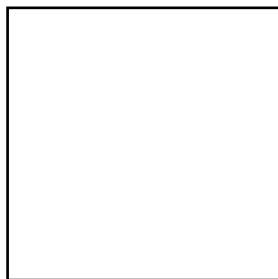


..... divisions in length
 divisions in breadth
 Total parts in the whole
parts of that type

$= \boxed{}$

Make the required number of divisions in length and breadth and find the answers –

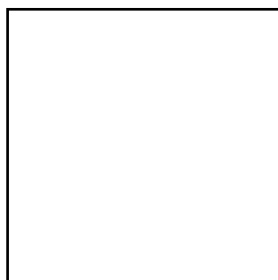
$$\frac{5}{6} \times \frac{5}{6}$$



..... divisions in length
 divisions in breadth
 Total parts in the whole
parts of that type

$$= \square$$

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



..... divisions in length
 divisions in breadth
 Total parts in the whole
parts of that type

$$= \square$$

Can you guess the answer of $\frac{2}{4} \times \frac{2}{4}$?

Have you discovered the rule,

$$\text{product of two fractions} = \frac{\text{product of numerators}}{\text{product of denominators}}$$

Now, apply the rule and find answers -

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

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

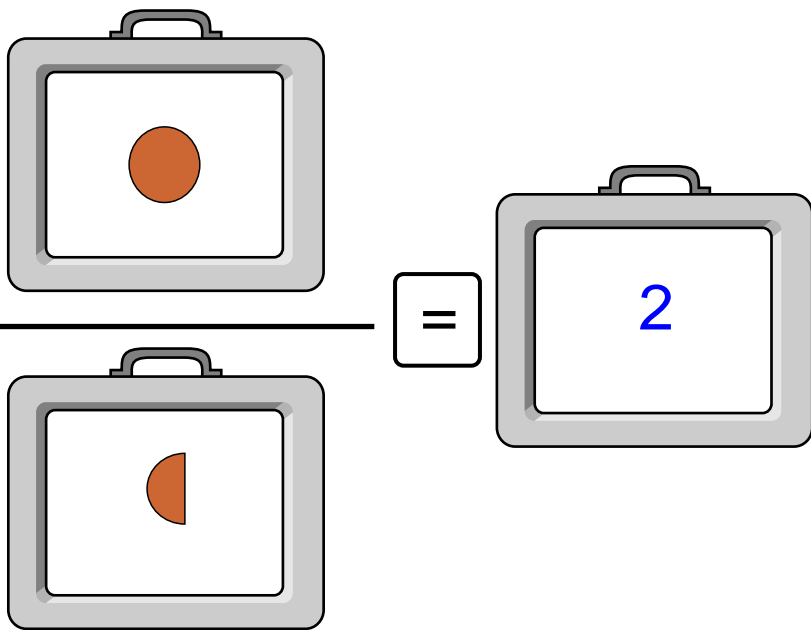
$$\frac{2}{3} \times \frac{4}{5} = \square$$

$$\frac{1}{4} \times \frac{3}{7} = \square$$

$$\frac{7}{8} \times \frac{2}{5} = \square$$

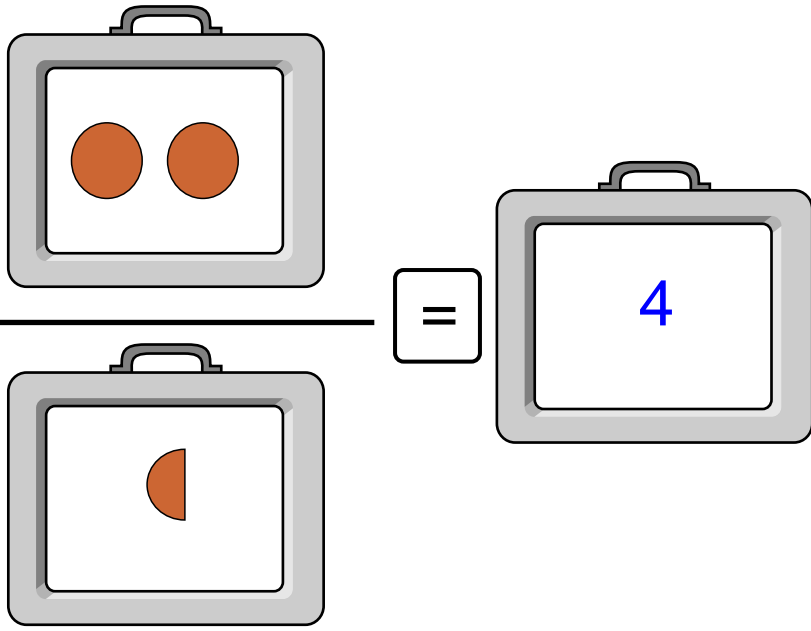
$$\frac{3}{4} \times \frac{8}{5} = \square$$

$1 \div \frac{1}{2}$ How many groups of half rotis are there in one roti?



The diagram shows a large rounded rectangle divided into two horizontal sections. The top section contains one whole roti with a brown circle in the center. The bottom section contains two half rotis, each with a brown semi-circle. To the right of the bottom section is a small box containing an equals sign (=). To the right of the equals sign is a larger box containing the number 2. To the right of the entire diagram is the equation $1 \div \frac{1}{2} = 2$ in blue text.

$2 \div \frac{1}{2}$ How many groups of half rotis are there in two roties?



The diagram shows a large rounded rectangle divided into two horizontal sections. The top section contains two whole rotis, each with a brown circle in the center. The bottom section contains four half rotis, each with a brown semi-circle. To the right of the bottom section is a small box containing an equals sign (=). To the right of the equals sign is a larger box containing the number 4. To the right of the entire diagram is the equation $2 \div \frac{1}{2} = 4$ in blue text.

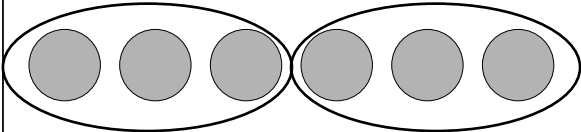
Think and Answer -

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

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

$$6 \div \frac{1}{2} = \boxed{}$$

Draw pictures as per the division and find the answers

| | | | |
|--------------------------------|---|---------------------------------------|-----------------|
| $6 \div 3$ |  | groups of 3-3 rotis in 6 roties | Answer 2 |
| $6 \div 1$ | | | |
| $6 \div \frac{1}{2}$ | | | |
| $1 \div \frac{1}{2}$ | | | |
| $1 \div \frac{1}{4}$ | | | |
| $1 \div \frac{1}{6}$ | | | |
| $2 \div \frac{1}{4}$ | | | |
| $2 \div \frac{1}{3}$ | | | |
| $\frac{1}{2} \div \frac{1}{4}$ | | | |
| $\frac{1}{2} \div \frac{1}{6}$ | | | |

Universal Active Math

Math has many languages

The language of hands and fingers

The language of words

The language of sounds

The language of pictures

The language of things

The language of shapes

The language of patterns

The language of numbers

Math does not have only one language. Therefore it cannot be learned only through paper, pen or blackboard nor can it be memorized/ learned by rote.

Universal Active Math method aims at introducing all the languages of math. We will use objects for the language of things, and then for the language of pictures and the language of numbers we will use Math Delight.

A child who is familiar with this way of learning math, would enjoy, discover, understand, and master math.



NAVNIRMITI

