Mathematics

Grade 4

Government of Nepal
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Send your comment and suggestions to:

Editing and Publishing Section, Curriculum Development Centre
Phone: 01-6630-588, Fax: 01-6630-797
Email: cdc@ntc.net.np
Website: moecdc.gov.np

Preface

School education is the foundation for preparing the citizen who are loyal to the nation and nationality, committed to the norms and values of federal democratic republic, self-reliant and respecting the social and cultural diversity. It is also remarkable for developing a good moral character with the practical know-how of the use of ICT along with the application of scientific concept and positive thinking. It is also expected to prepare the citizens who are moral and ethical, disciplined, social and human value sensitive with the consciousness about the environmental conversation and sustainable development. Moreover, it should be helpful for developing the skills for solving the real life problems. This textbook 'Mathematics, Grade 4' is fully aligned with the intent carried out by the National Curriculum Framework for School Education, 2076 and is developed fully in accordance with the new Basic Level Curriculum, 2078.

This textbook is initially written by Mr. Hari Narayan Upadhaya, Mr. Sujan Kafle, Mrs. Sarala Devkota, Mrs. Ritu Shrestha, Mr. Jagannath Adhikari and Mr. Ram Chandra Dhakal. It has been translated by Mr. Tikaram Pokharel, Mr. Nabin Poudel, Mr. Jagannath Adhikari and Mr. Ram Chandra Dhakal. The contribution made by Director General Mr. Baikuntha Prasad Aryal, Dr. Ramji Prasad Pandit, Mr. Ram Hada, Mrs. Nirmala Gautam, Mr. Keshav Phulara and Mrs. Pramila Bhakati is remarkable in bringing the book in this form. The language of the book has been edited by Mr. Nabin Kumar Khadka. Art editing of this book was done by Mr. Shreehari Shrestha by making it four colour. The Curriculum Development Centre extends sincere gratitude to all of them.

The textbook is a primary resource for classroom teaching. Considerable efforts have been made to make the book helpful in achieving the expected competencies of the curriculum. Curriculum Development Centre always welcomes constructive feedback for further betterment of its publications.

2079 BS

Curriculum Development Centre
Sanothimi, Bhaktapur

Contents

Lesson 1

Lines and Angles

1.1.1 Review

Look at the following figures, discuss and present your conclusion in the classroom:



i. Where are the angles formed in the above figures.

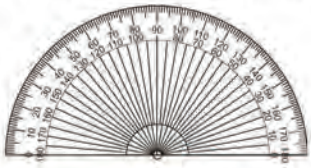
ii. Observe the figure and state the biggest angle and the smallest angle formed.

iii. Collect similar kinds of things and show the vertex, sides, and angles by drawing their figure.

1.1.2 Protractor

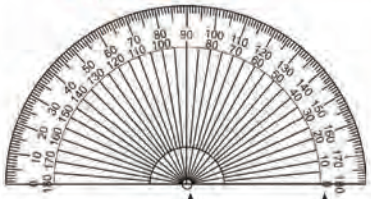
Activity 1

Work in groups of four. Look at the instrument from the geometry box as shown below. State the smallest to largest numbers marked in the instrument. What are the other components of the instrument? What is the use of this instrument?



Activity 1

Such a geometrical instrument is called a protractor.



Among the instruments from the geometry box, The instrument shown in the figure above is the protractor.

The circular edge of this instrument is divided into 180 equal parts. Each part represents 1 degree. In the symbol, it is written as 1°. State why the scale in the protractor is written in two ways? What is the use of writing the scale in two ways?

A protractor is a semicircular device that is used for the measurement and construction of angles. The straight line just below the semi-circular part is called a baseline. 0 and 180 is written at both ends of the line. The point which joins the line from 90 and baseline is called the center off the protractor. The protractor is used for measuring and constructing angles.

1.1.3 Measurement and construction of angle using protractor

A. Measurement of angle

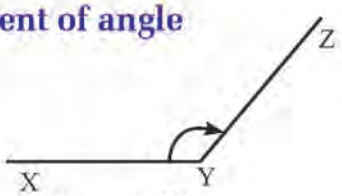


figure (i)

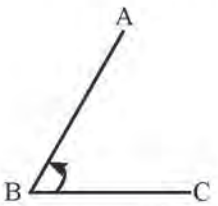
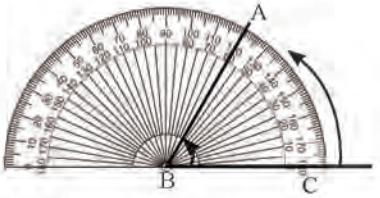


figure (ii)

Activity 1

How do we find the measurement of the angles above?

i. Place the protractor above the angle matching center of the protractor with the vertex of the angle and the baseline of the protractor with the base side of the angle.



ii. One of the two numbers pointed by another line which makes an angle with the baseline represents the angular measure.

While measuring angle, the measurement is taken from 0 of the base line and counting towards the line which makes the angle with the base line.

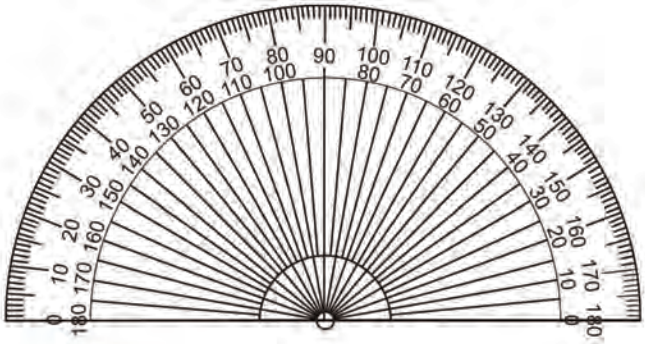
In ∠XYZ, XY is the baseline and Y is the vertex. Counting from X, the side ZY points to 130 in the protractor. So, ∠XYZ =130. Similarly, in ∠ABC, B is the vertex and BC is the baseline. Counting from C, the side AB points towards 60 in the protractor. So, ∠ XYZ=60°.

Activity 2

Let us make a protractor

Materials required: card paper, protractor, pencil, and ruler

Place the protractor above the card paper to trace and construct the protractor as shown below.



(B) Construction of angle

Activity 3

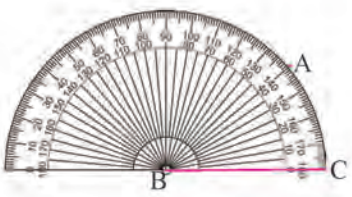
How will an angle be constructed with the help of protractor?

Construction of angle ABC =40° with the help of a protractor

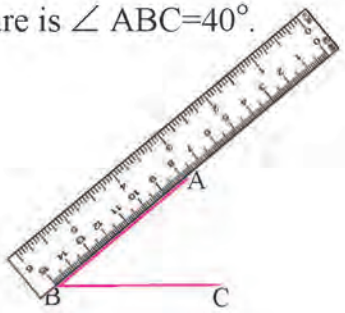
i. Draw line segment BC using ruler.

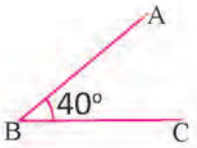
ii. Place the point B at the center of the protractor.

iii. Mark a point A by counting 40 from C.



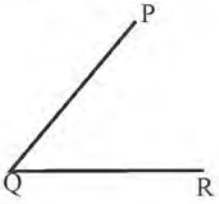
iv. Place the ruler and join line segment AB. The angle ABC is, thus, formed. The measure is $\angle ABC = 40°$.





Example 1

Find the measurement of angle $\angle PQR$ using the protractor.



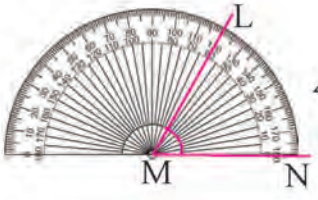
Solution:

QR is the baseline and Q is the vertex in the angle $\angle PQR$. Counting from R line, PQ shows towards 50. So, angle $\angle PQR = 50°$

Activity 4

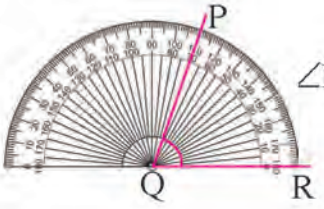
The angles in the figure below, are measured with a protractor. Work in pairs to find the measurement of the angles.

(a) 50°



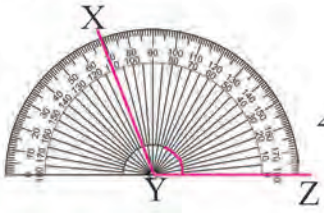
$\angle LMN = 60°$

(a) 70°



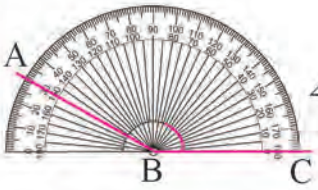
$\angle PQR = 70°$

(c) 110°



$\angle XYZ = 110°$

(d) 150°



$\angle ABC = 150°$

Example 2

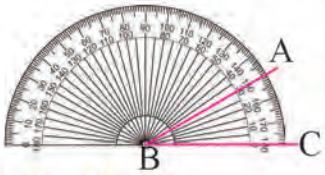
Construct angles of the following measurement using the both-way scale of the protractor.

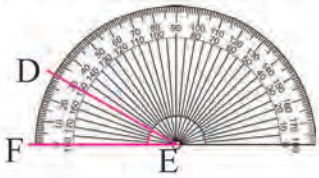
(a) 30° (b) 120°

Solution:

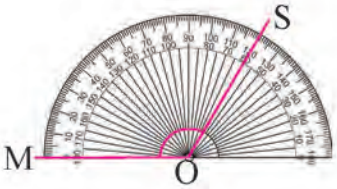
(a) Constructing the angle of 30° using both ways scale of the protractor

(b) constructing the angle of 120° using both- way scale of the protractor





1. Fill in the blanks.



Exercise

i. The shape of the protractor is .....

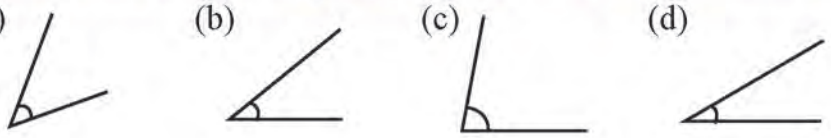
ii. The scale from 0 to ..... is written on the protractor.

iii. The straight line at the bottom of the protractor is called .....

iv. We use ..... to measure the angle.

2. Measure the following angles and find the smallest one.

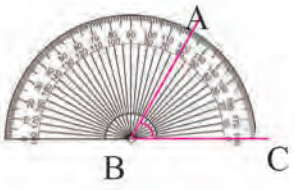
(a) (b) (c) (d)

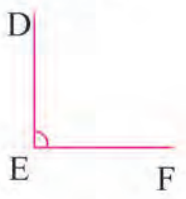


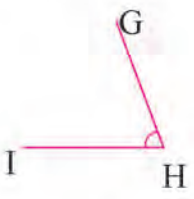
3. Write the uses of the protractor.

4. Write the measurement of the following angles in degree using a protractor.

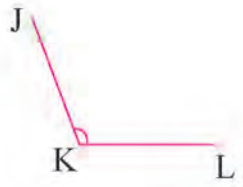
(i) (ii) (iii)

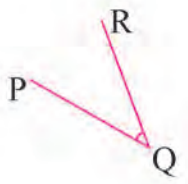




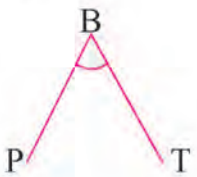


(iv) (v) (vi)





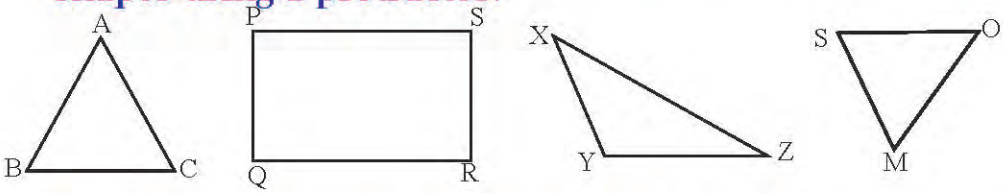
(vii) (viii)



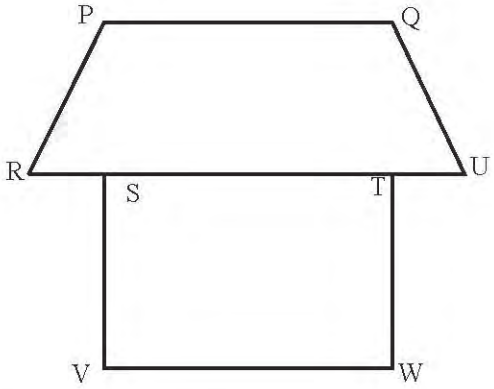
5. Construct the angles of the following measurements using a protractor.

(i) 60° (ii) 20° (iii) 50° (iv) 100° (v) 120°

6. Find the measurement of interior angles of the following shapes using a protractor.



7. Find the number of angles in the following figure. Measure each angle and write down on the copy.



Project work

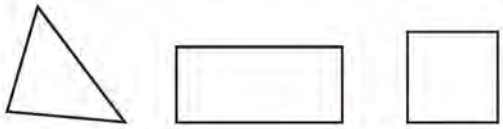
1. Collect the angular objects from your home and school surroundings. Draw figures to represent them and measure the angles with the help of a protractor, and present it in the classroom.

2. Observe the list of English alphabet (Capital) for the formation of angles on them. Pick any three English alphabets and write them on the chart paper. Find the measurement of the angles in them.

Lesson 2 Plane Surface

2.1 Review

Work in a group of suitable size. Collect some straws from your surroundings. Prepare various geometrical shapes with the help of the straws, present them in the classroom and discuss them.

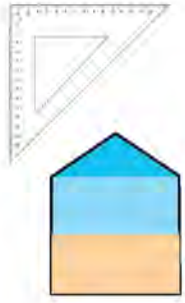


2.2 Plane figures

Activity 1

Observe the following shapes. Discuss in a group to find the number of edges and vertices of each shape.

(i) 

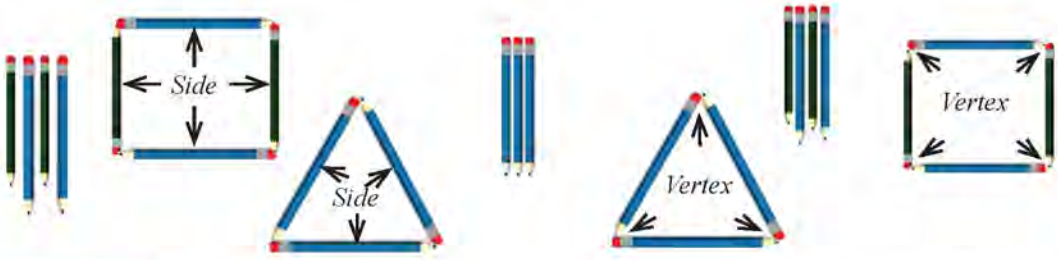
(ii) 

(iii) 

(iv)

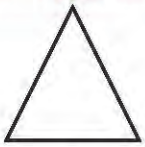
Activity 2

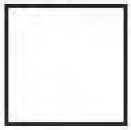
Work in groups of four students each. Take some pencils and arrange them to make triangles and parallelograms of a different kind and discuss their components (sides and angle) in the group.



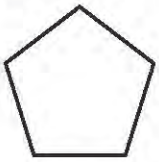
Activity 3

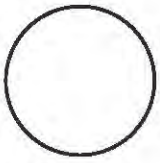
Work in a group of three students each. Discuss about the following plane figures based on the questions given below.

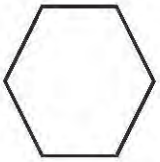
(i) 

(ii) 

(iii) 

(iv) 

(v) 

(vi) 

i. How many sides are there in each plane figure?

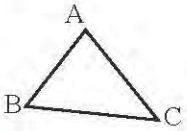
ii. How many vertices are there in each plane figure?

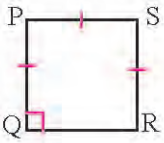
iii. What are the names of given plane figures?

The straight-line segments in the plane figure are called sides. The point where the line segments meet is called vertex and the shape formed by the two line segments and their common vertex is called angle.

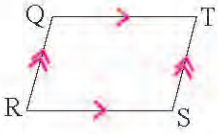
Example 1

Write the names of the following plane figures. Name the sides and the vertices as well.

(i) 

(ii) 

(iii) 

(iv) 

Solution:

i) Triangle ABC

Side: AB, BC, CA

Vertices : A, B, C

ii) Square PQRS

Sides : PQ, QR, RS, SP

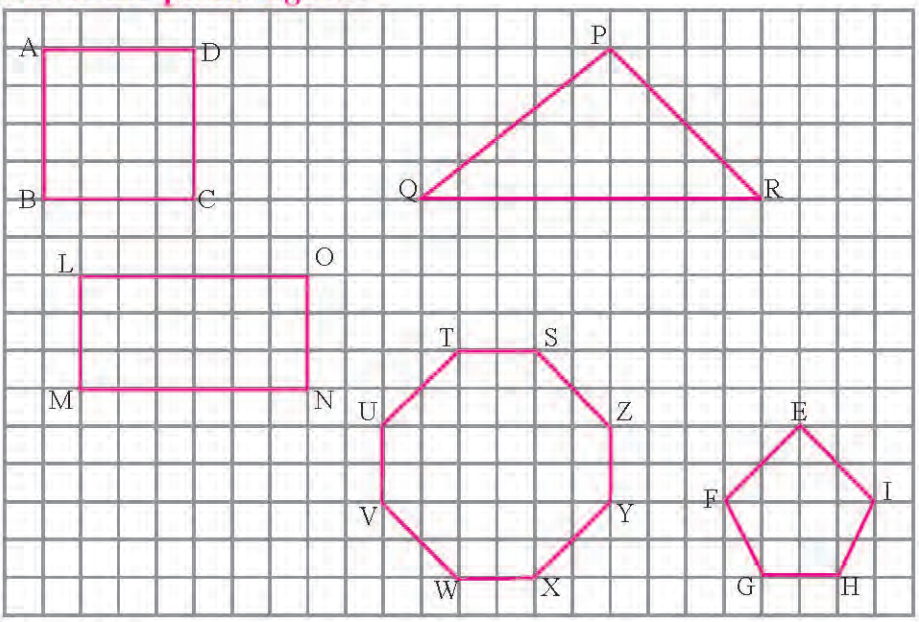
Vertices: P, Q, R, S

iii) Rectangle MNOP
Sides : MN, NO, OP, PM
Vertices : M, N, O, P

iv) Quadrilateral QRST
Sides : QR, RS, ST, TQ
Vertices : Q, R, S, T

Example 2

look at the following figures. Write the name of the sides and vertices of the plane figures



solution

i) In square ABCD,
Sides: AB, BC, CD, DA
Vertices: A, B, C, D

(ii) In Triangle PQR
Sides: PQ, QR, RP
Vertices: P, Q, R

(iii) In rectangle LMNO
Sides: LM, MN, NO, OL
Vertices: L, M, N, O

(iv) In Pentagon EFGHI
Sides: EF, FG, GH, HI, IE
Vertices: E, F, G, H, I

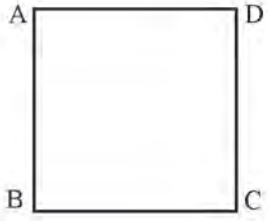
(v) In octagon STUVWXYZ
Sides: ST, TU, UV, VW, WX, XY, YZ, ZS
Vertices: S, T, U, V, W, X, Y, Z

1.2.3 Measurement of sides of plane figures

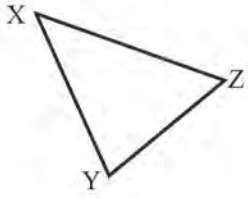
Activity 1

find the length of each side of the following plane figures using ruler and present them in the classroom.

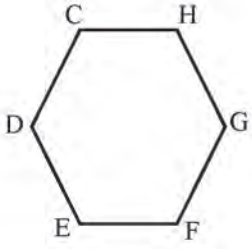
(i)



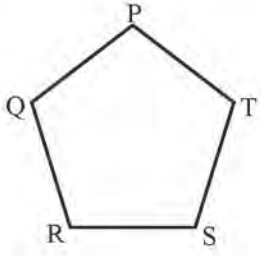
(ii)



(iii)



(iv)



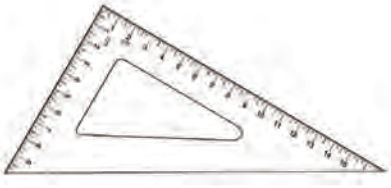
Activity 2

Work in a group of five. Trace the surface of the following objects in the exercise book. Discuss the process of measuring the length of sides and present it in the classroom.

(i)

(ii)

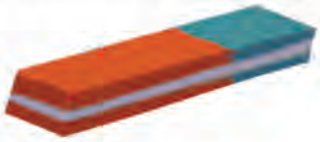
(iii)



(iv)

Example 1

Trace the surface of the rectangular-shaped eraser and soap, and find the length of each side of the figure thus formed. Show your solution to the teacher.



Exercise

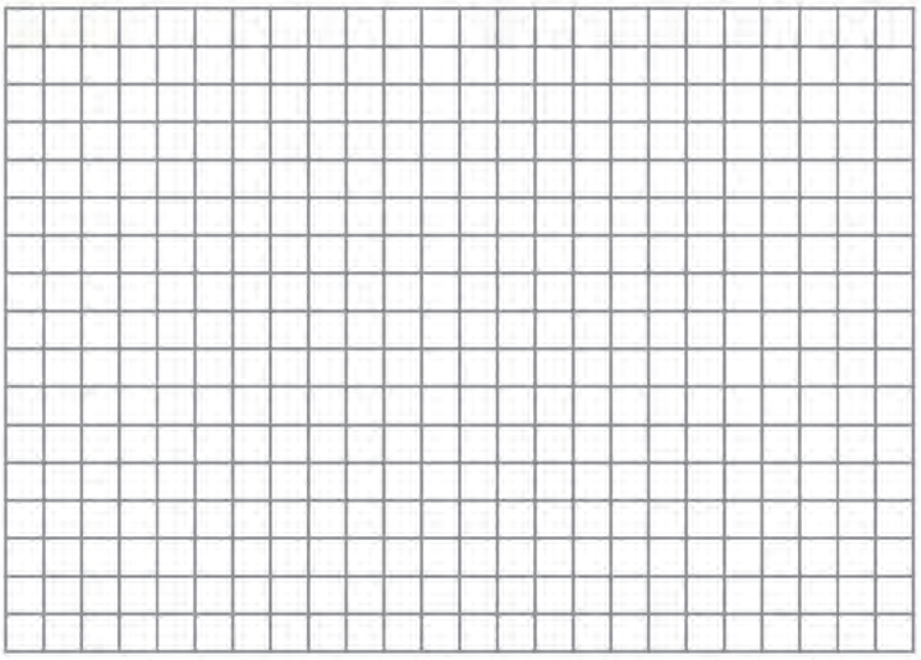
1. Fill in the blanks:

i) There are .....vertices in the triangle.

ii) The sides of the square are .....

iii) Opposite sides of a rectangle are.....

2. Construct squares of the given size in the square grid below.

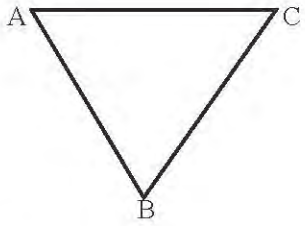


a. 5 units b. 6 units c. 7 units

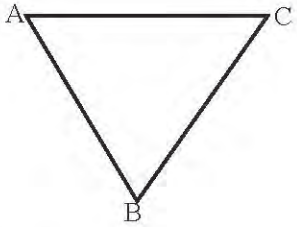
3. Construct four plane figures using a ruler.

4. Write the name of the sides and the vertices of the plane figures given below.

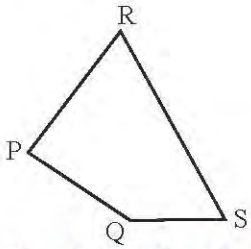
(i)



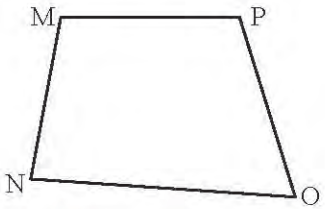
(ii)



(iii)

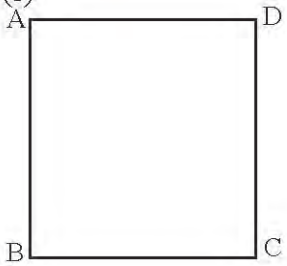


(iv)

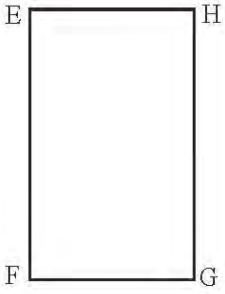


5. Find the length of the sides of the plane figures given below.

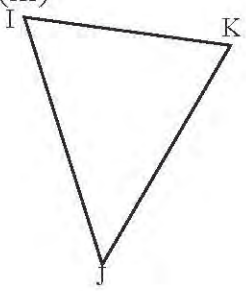
(i)



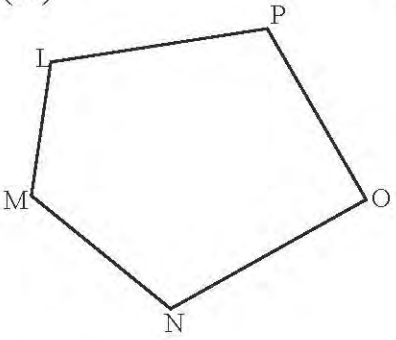
(ii)



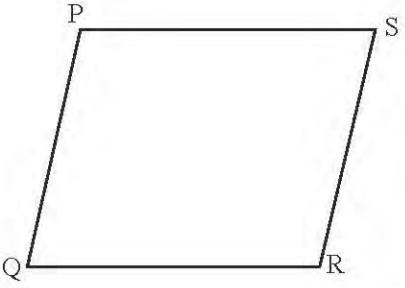
(iii)



(iv)



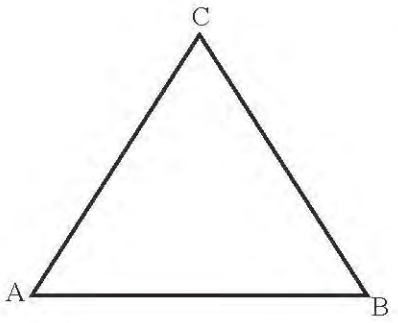
(v)



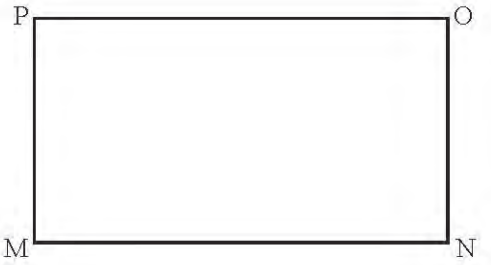
6. **Draw three different three-sided plane figures and measure the length of their sides.**

7. **Name the sides of the plane figures given below and measure their length.**

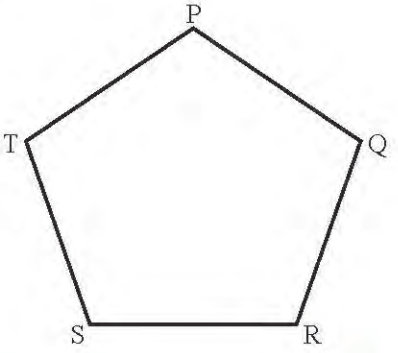
(i)



(ii)



(iii)



Project work

Collect any five objects used in your home that have plane surfaces. Trace their edges on your exercise book, and present it to the class. Have you ever seen such objects in your surrounding and public places? List them.

Lesson 3 Solid objects

3.1 Review

Look at the following shapes and discuss about the plane surface on them in your classroom.

(i) (ii) (iii) (iv)




3.2 Shapes of solid objects

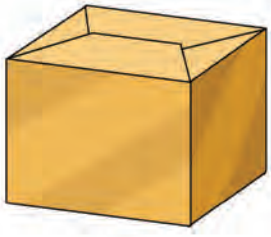
Activity 1

Categorize the following solid objects into two groups based on their shapes. Draw two more objects of the same kind.

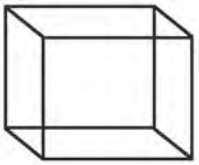
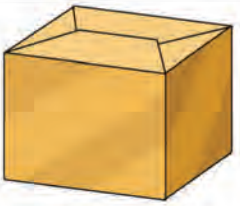
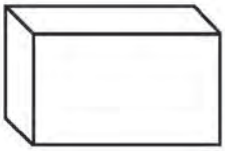
(i) (ii) (iii)



(iv) (v) (vi)

Look at the solid shapes and their examples

Name of the shape	Objects/examples
Cube 	 Dice  rubrics cube  cubical box
Cuboid 	 Book  Suitcase  Juice box

All the faces of cube are square plane surface .

Activity 2

Prepare a group of suitable number of students. Select one of the following objects for each of the groups. Observe the surfaces of the object and find the total number of surfaces.

(i) (ii) (iii) (iv)

 Dice  Tea box  sweet box  Chalk box

There are 6 plane surfaces in each of the objects above. The surfaces of the dice and chalk box are square in shape. So, dice and chalk box are cubes. All surfaces of the tea box and sweet box are rectangular. The opposite surfaces of these objects are equal. So, these objects are cuboids.

Example 1

Look at the following objects and name their shape.

(i) (ii) (iii) (iv)

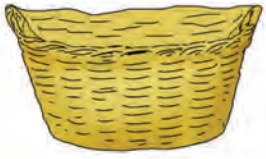



Solution: i) cuboid ii) cuboid
iii)cube iv) cuboid

Exercise

Write the name and shape of the following objects.

(i) (ii) (iii)


(iv) (v)


2. Write the name of the two cuboids and cube-shaped objects from your surroundings.

3.3 Faces, edges and vertices of solid objects

Activity 1

The figure of a soap bar is given below. Observe the figure carefully and find the numbers of the plane surfaces on it. Also find the number of vertices and edge. Present the information in your classroom.

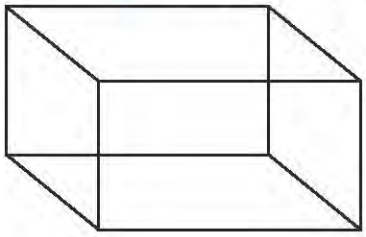
Activity 2

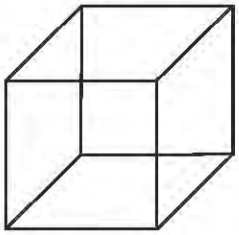
Use juice straw or wheat straw to make the model of a cube and a cuboid with the help from your teacher. Paste different colour paper on each face of the model you prepared. Then find the total number of faces, edges and vertices. Present the information you have drawn in your classroom.

The joint where the straws join together is called vertex. The closed plane surface, thus, formed is called face. The joint where two surfaces meet is called edge.

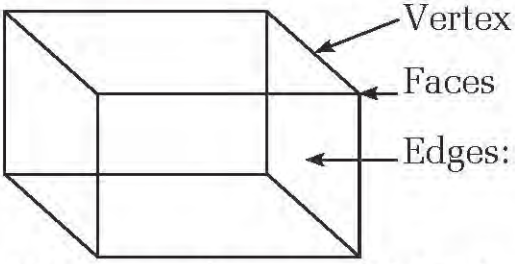
Example 1

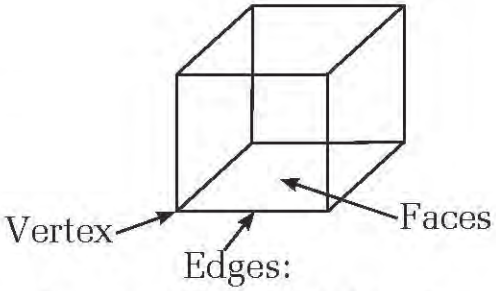
i. Show the faces, vertices and edges of the following solid objects.



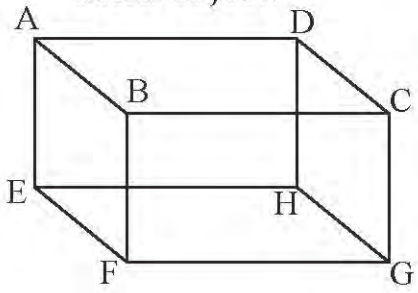


Solution





ii) Write the name of the face, vertex, and edges of the given solid object.



Solution

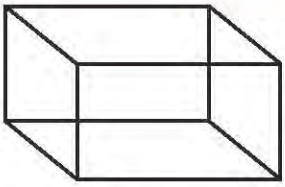
Faces: ABCD, AEFB, BFGH, CGHD, AEHD, EFGH

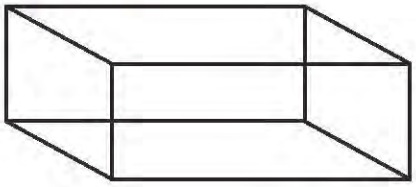
Edges: AB, BC, CD, DA, AE, EF, FB, FH, GH, EH, GC

Vertexs: A, B, C, D, E, F, G, H

Exercise

1 Draw the figure of the solid object as shown below. Show the vertices, edges and faces.





2. Show the vertices, edges and faces of the following objects or objects like them:

(i) 

(ii) 

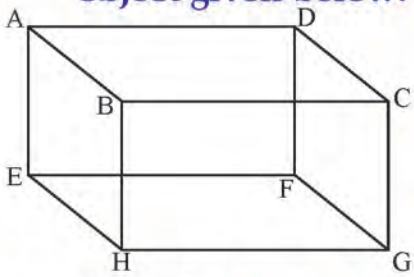
(iii) 

(iv) 

(v) 

(vi) 

3. Write the name of the vertices, edges and faces of the solid object given below.

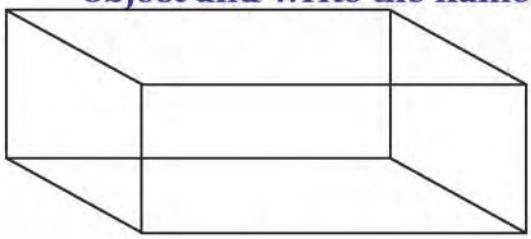


Faces: _____

Vertices: _____

Edges: _____

4. Give the name to each of the vertices of the given solid object and write the name of the faces and edges



Faces: _____

Vertices: _____

Edges: _____

Project work

1. Collect any five cubical and cuboid shaped objects and present them in your classroom with their names.
2. Prepare a model of cube and cuboid with locally available resources.

Mixed Exercise

1. Circle (O) the correct answer.

i) What is the name of the straight line at the bottom of the protractor?

a. straight line b. semicircle

c. base line d. complete line

ii) How many edges are there in a cuboid?

a. 6 b. 8 c. 12 d. 16

iii) which one of the following is a cube?

a) ball b) matchbox

c) book d) dice

IV) If I am a foursided closed plane figure with all angles equal, then who am I ?

a) triangle b) rectangle

c)quadrilateral d) circle

v) If I am a four equal sided closed plane figure with all of my angles equal, then who am I?

a) triangle b) square

c) Quadrilateral d) circle

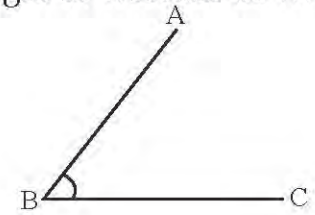
2. Fill in the blanks with suitable word.

a) There are ..... sides in a triangle.

b) There are ...sides in quadrilateral.

c) There are .....sides in a pentagon.

d) The given angle is written as .....



3. use ruler to find the length of the line segments given below.

(i) A B

(ii) C D

(iii) E F

(iv) G H

4. Join the given points with a line segment and find their length.

(i) P Q

(ii) Y X

(iii) M N

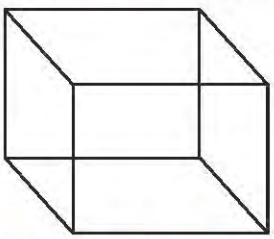
(iv) O P

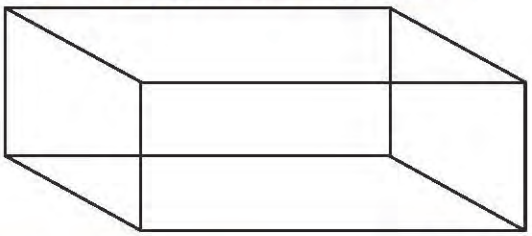
5. Draw the line segments of following length.

(i) 5 cm (ii) 7 cm (iii) 4.5 cm

(iv) 10 cm (v) 9.5 cm

6. Name the shape of the following solid objects.

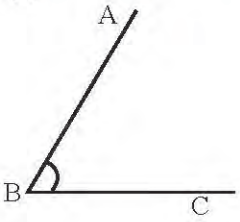




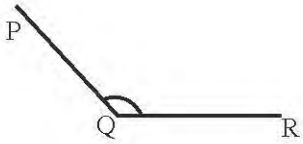
7. Write the name of two objects you use that have plane surfaces.

8. Use your protractor to measure the following angles.

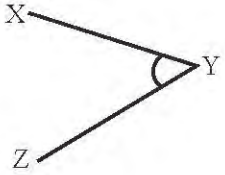
(i)



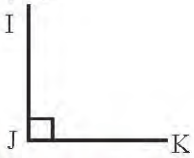
(ii)



(iii)

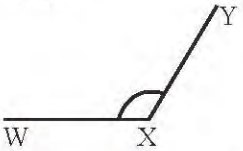


(iv)



(v)

(vi)



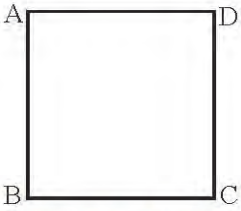
9. Construct the angle of following measurements using protractor .

(i) 30° (ii) 60° (iii) 70° (iv) 90°

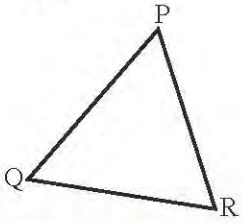
(v) 110° (vi) 150°

10. Write the name of vertices and sides of the following shapes.

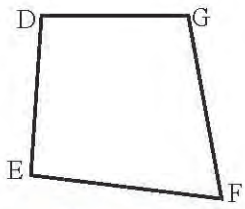
(i)



(ii)

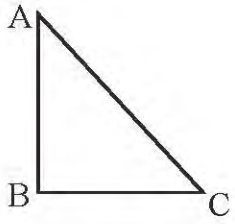


(iii)

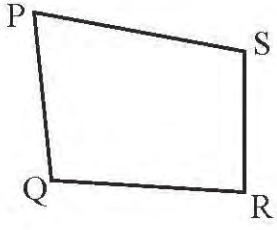


11. Find the length of the sides of the following shapes using ruler.

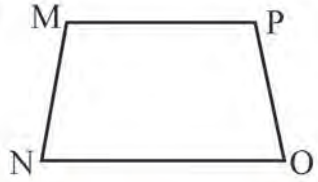
(i)



(ii)



(iii)



(iv)

12. Identify the vertices, edge and face of the following solid objects

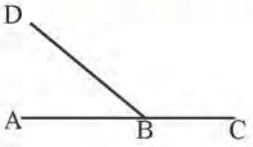
(i)

(ii)

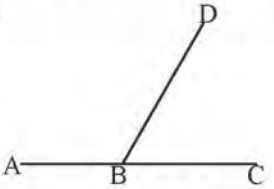
(iii)

13. Look at the following figures and answer that follows.

(a)



(b)



a. find the measurement of the angles ∠ABD and ∠CBD
b. Identify the bigger and the smaller angles of each figure.
c. Find the value that should be added to the smaller to make it the same size as the bigger.

14. Draw a line segment AB of length 5 cm. Draw an angle of 80 at both points A and B such that the sides intersects at C.

a. Name the figure thus formed.
b. Find the length of the sides BC and AC.
c. State how the sides AC and BC are related.

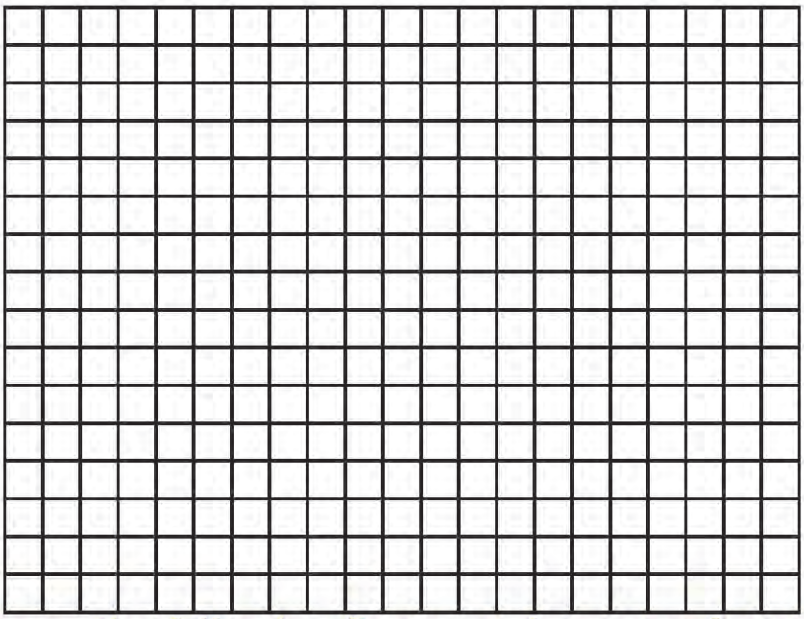
15. Draw a line segment PQ of length 6cm. Make the angle of 60o at P and Q such that the sides intersects at R.

a. Find the length of the sides PR and QR.
b. Find the size of angle ∠ PQR with the help of protractor.
c. State how the sides of triangle PQR are related.
d. State how the angles of triangle PQR are related.

16. Draw the rectangles of following measurement in the

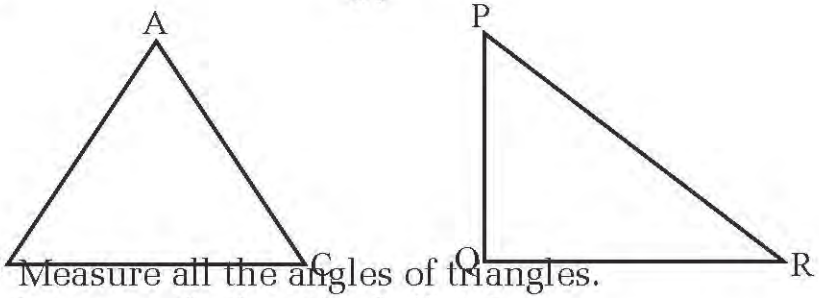
square grid given below.

i. length= 6 units, breadth= 3 units
ii. length= 3 units, breadth= 2 units
iii. length= 5 units, breadth= 4 units



17. Observe the following figures and answer the questions that follow.

(a) (b)



i. Measure all the angles of triangles.
ii. Measure the length of all sides.
iii. State the relationship between the longest side and greatest angles.
iv. State the relationship between the smallest angle and the smallest side of the triangle.

Lesson 4 Number sense

4.1 Review

How many members are there in your family? What is the total population of your community? How much is the population of your district? What is be the population of our country? Can we really count such population? Off course, we can count these population.

We use counting numbers to count whether it is the population of a place or the number of fruits produced in a garden. Such counting numbers are 1, 2, 3, 4... You may be wondering how our forefathers counted things before the invention of numerals in ancient times. Discuss with your teacher regarding counting techniques in the past.

Before the invention of numbers, our forefathers used a variety of counting strategies. They utilized strokes traced on the floor or walls to count the number of family members and their domestic animals. They used one-to-one correspondence with the number of family members who went outside with the stroke traced on the floor. In the same way, they removed the strokes written on the floor one by one, corresponding with their family member's return to home.

Strokes on the floor were not always beneficial. Such strokes were sometimes erased for several reasons. So, they changed their way of counting. To count people and objects, they used one-to-one correspondence with pebbles or marked on a stick or made a knot on a rope.

As the evolutionary race continued, people began to use symbols to indicate the total number of objects counted. Later these symbols came to be known as numbers. The Babylonian, Egyptian, Roman, Japanese, Chinese, Greek, and Hindu-Arabic cultures all had significant roles in the formation of numbers. The number system we use is referred to as the Hindu Arabic number system. In this system, we use the ten digits 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9. This number system is called decimal number system.

4.2 Numbers formed upto seven digits

A. Place Value

Activity 1

We have already learnt in class three about the way of writing and reading the numbers of five digits. Now we are going to study about seven-digit number. Let's study the following table:

Number of digits	Number	Number Name
The smallest one-digit number	1	One
The smallest two-digit number	10	Ten
The smallest three-digit number	100	Hundred
The smallest four-digit number	1000	Thousand
The smallest five-digit number	10000	Ten Thousnad
The smallest six-digit number	100000	Lakh
The smallest seven-digit number	1000000	Ten Lakh

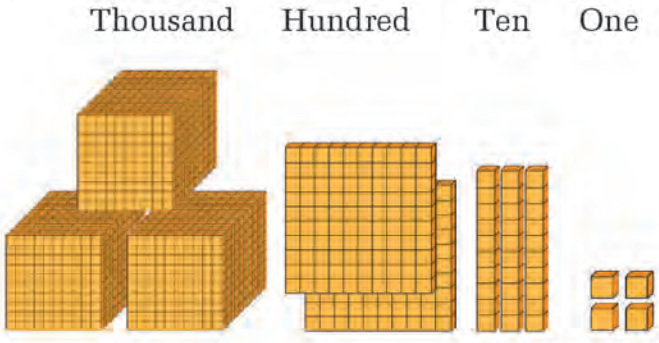
The place value table for 1000000 is

Ten lakhs	Lakhs	Ten thousand	Thousand	Hundred	Ten	One
1	0	0	0	0	0	0

Activity 2

Observe the given block and complete the place value table

Thousand	Hundred	Ten	One



In the figure, there are 4 ones, 3 tens, 2 hundreds and 3 thousands.
So, our place value table will be:

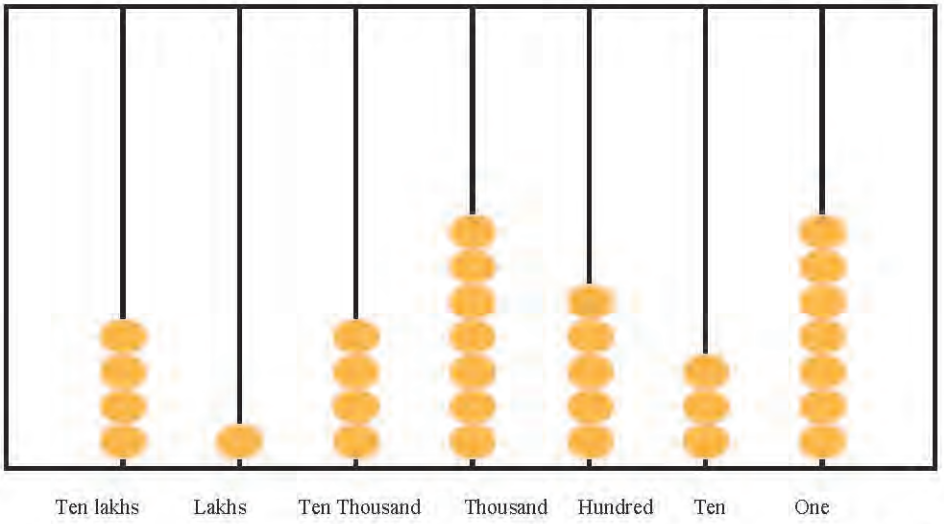
Thousand	Hundred	Ten	One
3	2	3	4

Number: 3,234
In words : Three thousand two hundred and thirty-four.

Activity 3

Look at the given Abacus and complete the place value table.

Ten lakhs	Lakhs	Ten thousand	Thousand	Hundred	Ten	One

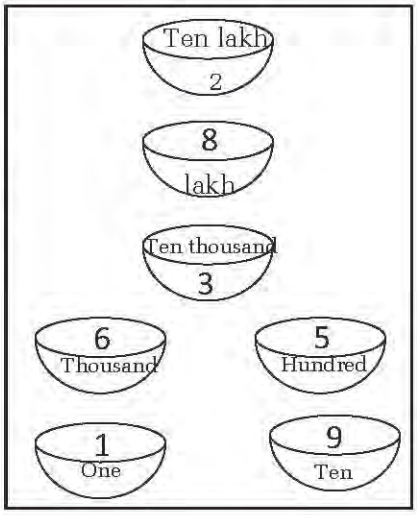


In the given Abacus there are 7 ones, 3 tens, 5 hundreds, 7 thousand, 4 ten-thousands, 1 one lakh and 4 ten lakhs beads. We can explain this information as in the following table:

Ten lakhs	Lakhs	Ten thousand	Thousand	Hundred	Ten	One
4	1	4	7	5	3	7

Activity 4

Make seven groups for yourself. One representative from each group should come up and select a digit card to place in a bowel. Examine the digit cards placed at each bowl and determine the resulting number. Put the number in a place value table and have a class discussion about it.



For example, students placed the card in the bowl labelled "one, tens, hundreds,.....ten lakhs" in the following order: 1,9,5,6,3,8,and 2.

Place it in a place value table and answer the questions that follow:

(i) Which numeral is placed in the bowl labelled lakh?

(ii) In which bowl is the digit 3 placed?

(iii) What is the total value of the digit placed in the bowl labelled "lakh"?

(iv) What will be the number formed by the digits placed in all the bowls in order?

The number thus formed will be 2836591. There are two values of the digits of any number. One is face value (observed) and another is place value. The face value of 8 is 8 itself but, the place value of 8 is eight lakhs. It is because $8 \times 1,00,000 = 8,00,000$.

Any digit of a number has three values to interpret. They are face value, place, and place value. For example, in the number 2836591 the face value of 5 is 5 itself. 5 is in the place of hundred so, place value of 5 is $5 \times 100 = 500$.

Example 1

Present the number 56,33,431, in place value table and write the face value, place, and place value of the number 6.

Solution:

Here the place value table for 56,33,431 is

Ten Lakh	Lakh	Ten thousand	Thousand	Hundred	Ten	One
5	6	3	3	4	3	1

Face value of 6 = 6
Place of 6 = Lakhs
Place value of 6 = $6 \times 1,00,000 = 6,00,000$

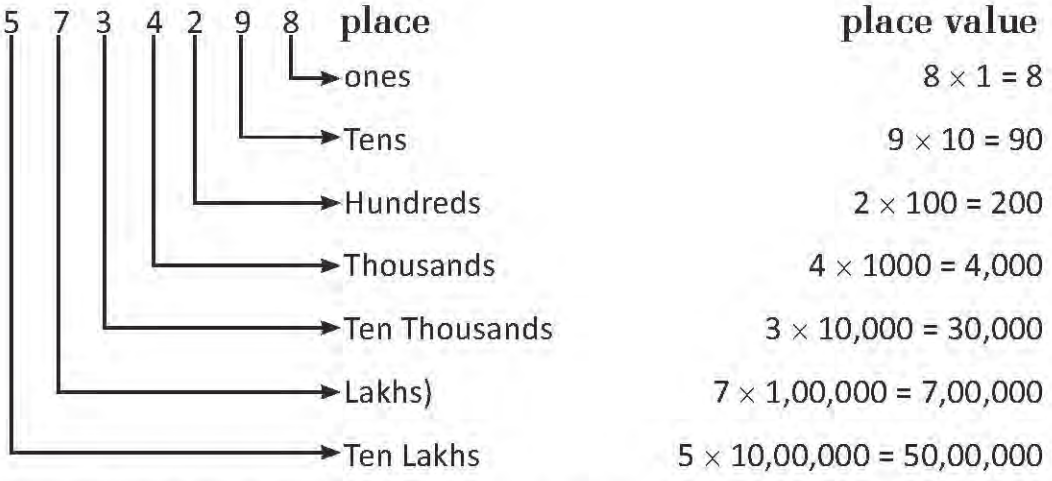
B. **Expanded Form**

Expanded form is a way of expressing numbers as the sum of the product of each digit with its place.

Example 2

Write the expanded form of the number 57,34,298

First, find the place value



ल्यध, $57,34,298 = 5 \times 10,00,000 + 7 \times 1,00,000 + 3 \times 10,000 + 4 \times 1,000 + 2 \times 100 + 9 \times 10 + 8 \times 1$

Exercise

1. Fill in the blanks.

i. The face value of 2 in the number 23,19,891 is.....

ii. The place value of 8 in the number 18,79,312 is .....

iii. The place value of 3 in the number 71,83,294 is .....

iv. ..... is in the place of Ten Lakhs in the number 10,53,216.

2. Present each of the following numbers in the place value table and write the place of 5.

(i) 93,45,281 (ii) 51,68,719 (iii) 12,67,815

(iv) 34,51,229 (v) 27,35,869 (vi) 83,651

3. Write the place value of the digit in the place of lakhs of the numbers below.

(i) 52,34,564 (ii) 10,05,301 (iii) 9,75,608

(iv) 5,63,204

4. Write the place value of the encircled digit of the numbers given below.

(i) 1(2),45,389 (ii) (2)4,68,135 (iii) 24,5(3),289

(iv) 89,(3)4,208

5. Write the expanded form of the following numbers.

(i) 34,758 =

(ii) 5,00,230 =

(iii) 8,00,201 =

(iv) 13,25,614 =

(v) 19,82,543 =

(vi) 67,89,123 =

6. Write the standard form of the given expanded form.

(i) $5 \times 1,00,000 + 3 \times 10,000 + 2 \times 1000 + 6 \times 100 + 9 \times 10 + 4 \times 1$

(ii) $2 \times 10,00,000 + 0 \times 1,00,000 + 0 \times 10,000 + 4 \times 1,000 + 3 \times 100 + 2 \times 10 + 6 \times 1$

(iii) $4 \times 10,000 + 5 \times 1,000 + 7 \times 100 + 8 \times 10 + 9 \times 1$

(iv) $6 \times 10,00,000 + 8 \times 1,00,000 + 0 \times 10,000 + 4 \times 1,000 + 0 \times 100 + 2 \times 10 + 7 \times 1$

(v) $8 \times 10,00,000 + 5 \times 10,000 + 0 \times 1,000 + 4 \times 100 + 7 \times 10 + 3 \times 1$

Project work

1. **Find the population of your local level with the help of your guardian or teacher and present it in a place value table.**

2. **Do you know of any other counting systems besides the ones we've discussed? Make a list of such counting systems. You can get information about such counting systems from your guardian.**

4.3 Numbers up to seven digits in words

Activity 1

Study the place value table below and answer the questions that follow.

Ten lakhs	Lakhs	Ten thousand	Thousand	Hundred	Tens	One
7	1	2	6	5	3	0

i. How many lakhs are there?
ii. How many thousands are there?
iii. How many hundreds are there?
iv. What is the number made of last two digits?
v. How to read and write the number ?

We can read the above number as seventy one lakh twenty six thousand five hundred and thirty and this number is written as 71,26,530.

A first comma, is placed after the third number from the left, and a second comma is placed after every second digit towards the left.

Example 2

According to the census 2068 BS the population of Kathmandu was 17,44,240. There are 9,13,0001 male and 8,31,239. Write these numbers in word .

Solution

Presenting the number in tabular form

Ten lakhs	Lakhs	Ten thousand	Thousand	Hundred	Ten	One	
1	7	4	4	2	4	0	Total population
	9	1	3	0	3	1	Male population
	8	3	1	2	0	9	Female population

Here,
Total population= = 17,44,240
Male population = 9,13,001
Female population = 8,31,239

In words,
Total population= Seventeen lakh forty four thousand two hundred and forty
Male population= Nine lakh thirteen thousand and one
Female population= Eight lakh thirty one thousand two hundred and thirty nine

Example 2

Shreekrishna received a government-subsidized loan from the Agricultural Development Bank for his livestock farm. He received a total of sixty-five lakhs fifty-three thousand five hundred and three rupees. Write the amount he received from the bank in number separated by commas.

Solution

Here
Shreekrishna's loan amount=65,00,000 + 53,000 + 500 + 3
= Rs. 65,53,503

To show using place-value table,

Ten lakhs	lakhs	ten thousand	thousand	hundred	ten	one
6	5	5	3	5	0	3

Exercise

1. Fill in the blanks

i. There are.....lakhs in 1215230.

ii. There are .....lakhs in 2505110.

iii. There are .....lakhs in 2000010.

iv. There are .....lakhs in

2. Put the comma in the appropriate position in the following numerals and write them in words.

(i) 2520344 (ii) 1000230 (iii) 6524000

(iv) 5820525 (v) 732008

3. Write in numerical form.

i. One lakh sixty one thousand five hundred and six.

ii. Five lakh twenty seven thousand and eight hundred.

iii. forty two lakh twenty three thousand five hundred and eighty two.

iv. Seventy lakh nine thousand seven hundred and twenty seven.

v. Eighty eight lakh fifty five thousand four hundred and forty two.

vi. Twenty lakh five thousand and five.

vii. Eighty three lakh thirty thousand four hundred and one.

viii. Five lakh eight thousand four hundred and seventy three.

ix. Thirty five lakh two thousand seven hundred and ninty one.

x. Fifty one lakh twelve thousand nine hundred and twenty three.

xi. Twenty one lakh fifteen thousand three hundred and seventy five.

xii. Seven lakh six thousand and fifty seven.

4. Write the following numerals in word in both English and Nepali scripts.

(i) 6,24,005 (ii) 25,27,003 (iii) 26,18,598

(iv) 48,02,212 (v) 24,00,005 (vi) 92,51,000

Project work

1. Inquire with your parents about the cost of various items in your household. Present the prices of items in the place value table.

4.4 Rounding off of numbers

Activity 1

Assume you live 100 meters from your school. On the way to home, it begins to rain. You don't have an umbrella. There are no places to halt and wait for the rain to stop. In the following case, what are you most likely to do?

i. The rain started after you walk for 20 m.

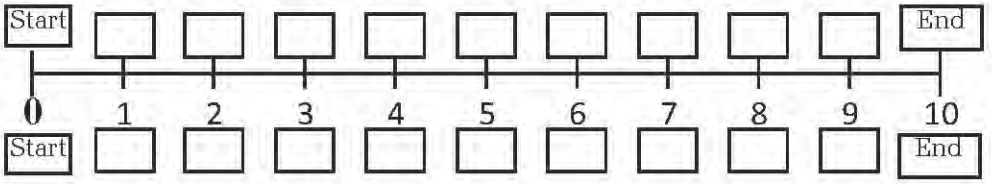
ii. The rain started after you walk for 50 m.

iii. The rain started after you walk for 60 m.

iv. The rain started after you walk for 85 m.

Activity 2

Divide the students into two groups. Go to the ground. Make a number line on the ground like the one shown below.



Each student group should stand on the opposite side of the line. Each group will send one student to play. The winner will receive one point. The team with the most points wins the game. The game's rules are as follows:

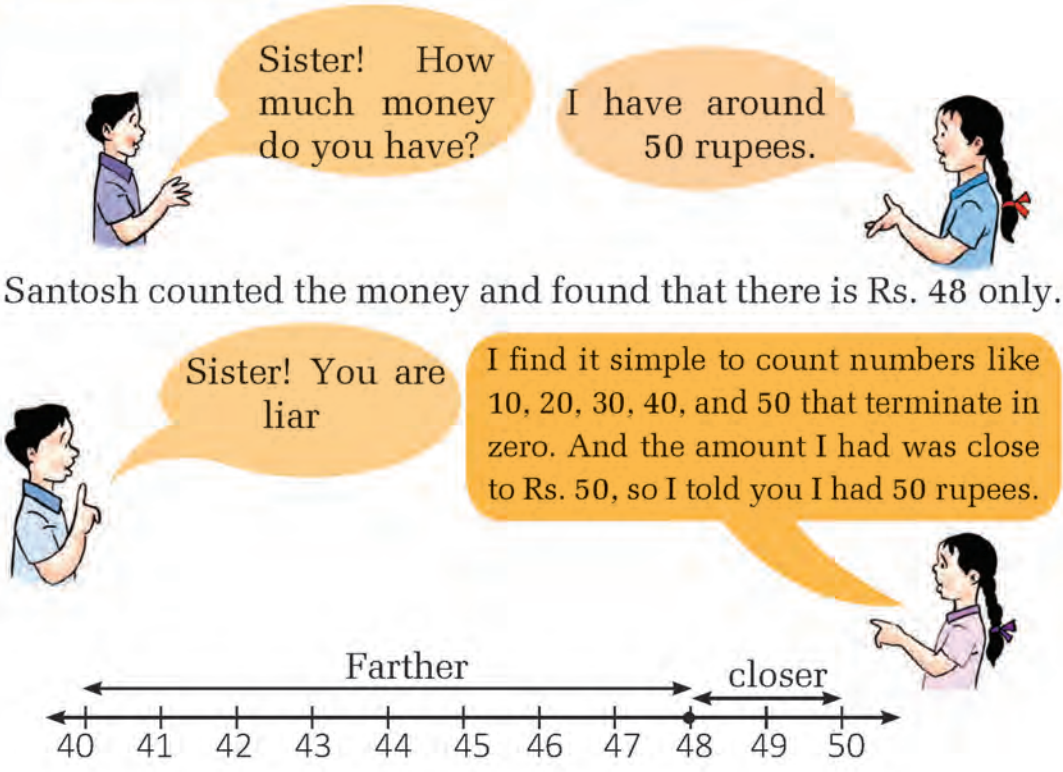
i. One player from each group will stand at the beginning position.

ii. Someone will be playing Madal. Student should leap from one box to the next till Madal plays.

iii. When Madal stops, both players should stop wherever they are. If the stop position is 5 or greater, the player will be advanced to the final position. If the player's stop position is less than five, the player will return to the starting position.

iv. The winner will be decided based on their score.

Activity 3



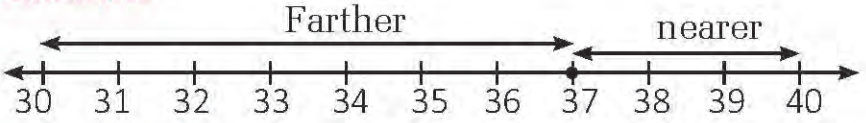
On the number line, 50 is closer to 48 than to 40. Thus, Round off is the process of writing any other numbers into numerals that end in zero, such as 20,30,.....,100,200,300.....

Numbers that are rounded to the nearest tens: 10,20,30,...120, 130, 150,... 2350.
Numbers that are rounded to the nearest hundred: 100, 200, ... 2300 etc.

Example 1

Round off 37 to nearest tens.

Solution

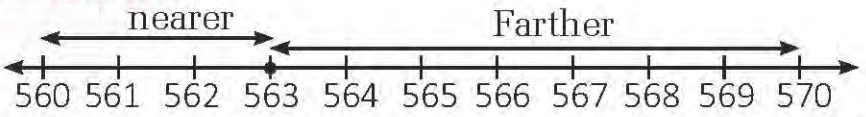


37 is very close to 40. So, the round off value of 37 is 40.

Example 2

Round off 563 to nearest tens.

Solution

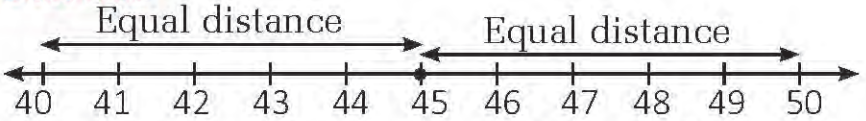


563 is very close to 560. So, the round off value of 563 is 560.

Example 3

Round off 45 to nearest tens.

Solution

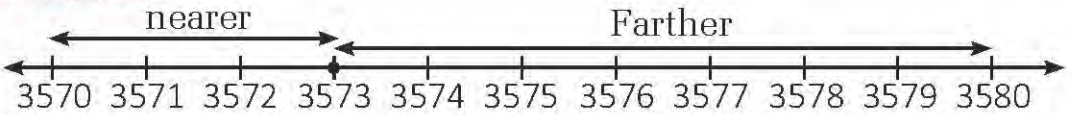


45 is equidistance from 40 and 50 both. However, we round off it to 50.

Example 4

Round off 3573 to nearest tens.

Solution

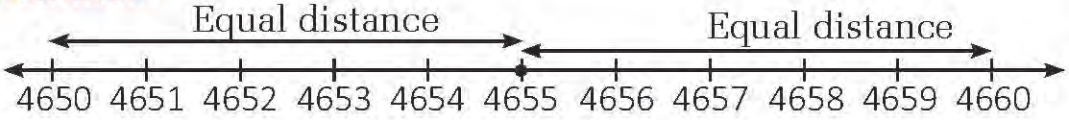


3573 is very close to 3570. So, the round off value of 3573 is 3570.

Example 5

Round off 4655 to nearest tens.

Solution

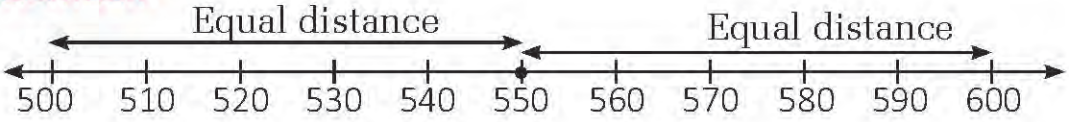


4650 is equidistance from 4650 and 4660. However, we round off it to 4660

Example 6

Round off 550 to nearest hundred.

Solution

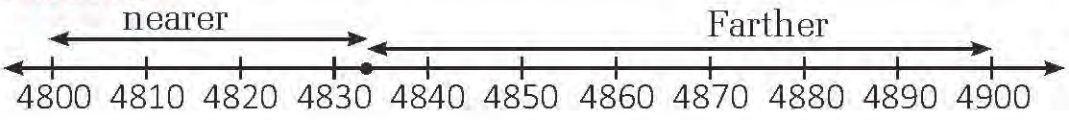


550 equidistance from 500 and 600. However, we round off it to 600.

Example 7

4833 to nrearest hundred.

Solution

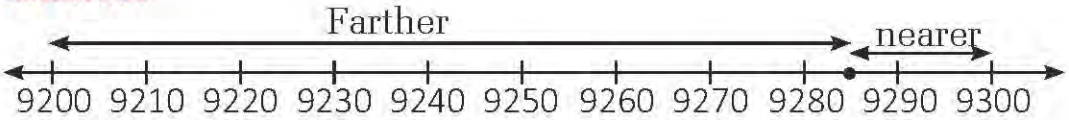


4833 very close to 4800. So, the round off value of 4833 it 4800.

Example 8

9285 to nearest hundred.

Solution



9285 is closer to 9300 so, the round off value of 9285 to nearest hundred is 9300.

When we round off a given number to the nearest place, we must seek for the digit at one step below place (If you round off to the nearest hundred, search for the digit in the tens place) . If the digit at the lower place is 5 or greater, add one to the digit at the round off place. If the digit in the lower position is less than 5, it should be changed to zero.

Exercise

1. Fill in the blanks

i. The ten below 15 is ..... and above 15 is .....

ii. The ten below 426 is ..... and above 426 is .....

iii. The ten below 4824 is ..... and above 4824 is .....

iv. The ten below 832 is ..... and above 832 is .....

v. The ten below 7542 is ..... and above 7542 is .....

2. Round off the following numbers in nearest ten.

(i) 16 (ii) 78 (iii) 245 (iv) 561

(v) 1680 (vi) 7825 (vii) 2456

3. Round off the following numbers in nearest hundred.

(i) 390 (ii) 505 (iii) 450 (iv) 5820

(v) 4850 (vi) 8270 (vii) 9234

Project work

Find the distance from Kathmandu to Pokhara, Kathmandu to Dumre, and Kathmandu to Muglin from any source. Round off them to nearest tens.

5.1 Review

A. Study the following question and discuss in the class.

i. You have Rs. 115 and your mother has given you Rs. 225. How much money do you have now?

ii. You went to the store(shop) to purchase an item, the cost of which was Rs. 295. If you gave the shopkeeper a 500 rupees note, find the amount that will be refunded to you.

iii. How much money will you have if your father gives you twelve 50-rupee notes?

iv. You have 20 toffies. You wish to share them equally among five close friends. How many toffies will each of your friends receive?

The addition, subtraction, multiplication and division are four basic operations.

B. Fill the blank box with suitable digit.

(i)

$$\begin{array}{r} 4\ \square\ 4\ 3 \\ +\ \square\ 2\ 3\ \square \\ \hline 9\ 8\ 7\ 5 \end{array}$$

(ii)

$$\begin{array}{r} \square\ \square\ 5\ 7\ 8 \\ +\ 6\ 3\ 4 \\ \hline \square\ \square\ \square\ \square \end{array}$$

(iii)

$$\begin{array}{r} \square\ 6\ 9\ \square \\ -\ 2\ 1\ \square\ 5 \\ \hline 7\ 5\ 3\ 1 \end{array}$$

(iv)

$$\begin{array}{r} \square\ \square\ 5\ 0\ 4 \\ -\ 2\ 3\ 8 \\ \hline \square\ \square\ \square \end{array}$$

(v) $24 \times 57 =$ ☐

(vi) $42 \times 56 =$ ☐

2. Find the sum as shown in the example below.

Example: 6 ones + 7 ones =13 ones =1 ten and 3 ones.

5 ones +9 ones=.....

8 ones + 9 ones=.....

5 ones +5 ones=.....

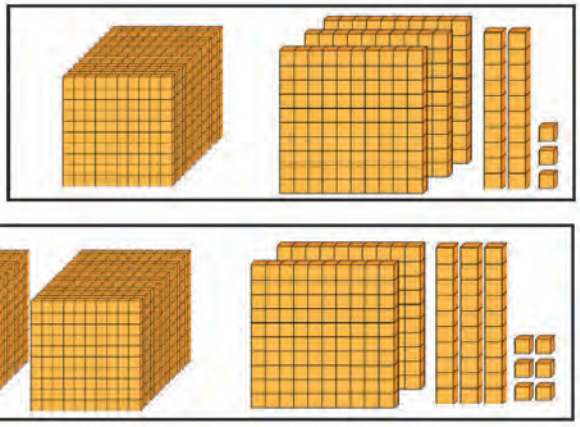
2 ones +8 ones=.....

5.2. Addition

Activity 1

Count the given base 10 blocks, fill in the numbers in the place value table, and calculate the sum.

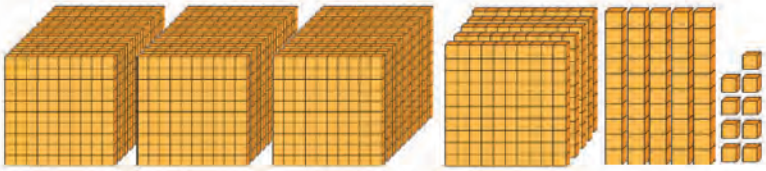
	Thousnd	Hundred	Ten	One
+				



There are three blocks of one, two blocks of ten, three blocks of hundreds, and one block of thousands in the first set of blocks. Similarly, there are six blocks of one, three blocks of ten, two blocks of hundreds, and two blocks of thousands in the second set of blocks. It can be written in place value table as:

	Thousnd	Hundred	Ten	One
	1	3	2	3
+	2	2	3	6

After mixing the both set of blocks together,



there are nine blocks of one, five blocks of ten, five blocks of hundreds, and three blocks of thousands. It can be written in place value table as:

	Thousnd	Hundred	Ten	One
	1	3	2	3
+	2	2	3	6
	3	5	5	9

Words like combining or gathering things of one group with another describes addition.

Activity 2

Guessing the price, and adding

For example:

Teacher: How much does it cost for one television?

Student: Rs. 54,450

Teacher: How much does it cost for one motorcycle?

Student: Rs. 2,15,000

Teacher: What will be the total price of both TV and motorcycle?

Student:

$$\begin{array}{r} 54{,}450 \\ +\ 2{,}15{,}000 \\ \hline 2{,}69{,}450 \end{array}$$

It is Rs. 2,69,450

Example 1

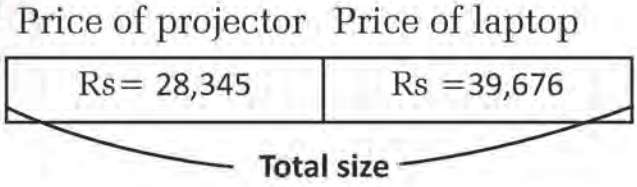
Add:

$$\begin{array}{rccccc} & 8 & 3 & 5 & 7 & 6 \\ + & 2 & 3 & 4 & 1 & 2 \\ \hline & 10 & 6 & 9 & 8 & 8 \end{array}$$

Example 2

Sujan requires a laptop and a projector. He went to the store to buy them. The projector costs Rs 28,345 and the laptop costs Rs 39,676. He purchased both. How much money would he pay for a laptop and a projector?

Solution




Rs. 39,676

Rs =28,345 + Rs =39,676 = ?

Adding them using place value table.


Rs. 28,345

	Ten thousand	Thousnd	Hundred	Ten	One
	2	8	3	4	5
+	3	9	6	7	6

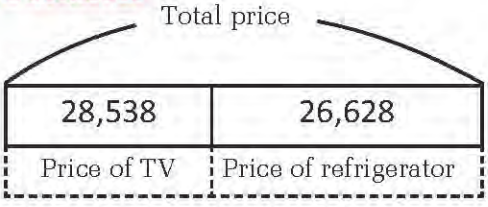
	Ten thousand	Thousnd	Hundred	Ten	One
	①	①	①	①	
	2	8	3	4	5
+	3	9	6	7	6
	6	8	0	2	1

He should pay a total of Rs. 68021

Example 3

Sujal bought a television and a refrigerator. The cost of TV was 28538 and the cost of Refrigerator was 26628. Find The total price of both items.

Solution



	①	①		①	
Rs.	2	8	5	3	8
+Rs.	2	6	6	2	8
Rs.	5	5	1	6	6

∴The total cost for a Television and a refrigerator was 55,166.

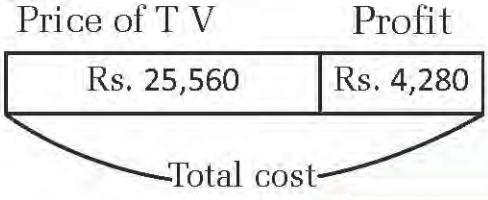
Example 4

A shopkeeper paid Rs. 25,560 for a television.At What price he should sell it for the profit of Rs. 4280?

Solution

The cost price = Rs. 25,560

Profit = Rs. 4,280



Selling price Rs.= ?

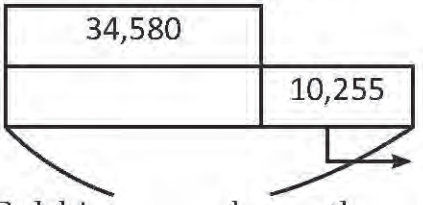
$$\begin{array}{r} \overset{1}{} \\ 25560 \\ +\ 04280 \\ \hline 29840 \end{array}$$

∴ The shopkeeper should sell this TV in Rs. 29840 to get the desired profit.

Example 5

In the first month, a copy manufacturer sold 34,580 copies. The manufacturer sold 10,255 more copies in the second month. Find out the number of copies manufacturer sold in the second month.

Sold in first month:



Solution

The number of copies sold in first month= 34,580
The total number of copies sold in second month =34,580+10,255
In second month, the shopkeeper sold 44,835 copies.

$$\begin{array}{r} \overset{1}{} \\ 34580 \\ +\ 10255 \\ \hline 44835 \end{array}$$

Exercise

In second monthe, the shopkeeper sold 44,835 copies.

1. Tick (√) for the correct statements and cross (×) for false ones.

i. There are 10 tens in one hundred. ☐

ii. 10 ones are equals to 1 ten. ☐

iii. There are 8 hundred in 1 thousand. ☐

iv. 10 thousand is equals to 1 ten thousand. ☐

2. Add:

(i)
$$\begin{array}{r} 3\,4\,5\,8\,0 \\ +\,1\,0\,2\,5\,5 \\ \hline \end{array}$$

(ii)
$$\begin{array}{r} 2\,8\,3\,2\,5 \\ +\,6\,8\,7\,3\,5 \\ \hline \end{array}$$

(iii)
$$\begin{array}{r} 8\,8\,3\,2\,7 \\ +\,2\,1\,6\,7\,3 \\ \hline \end{array}$$

(iv)
$$\begin{array}{r} 1\,2\,4\,5\,6 \\ +\,9\,7\,8\,5\,4 \\ \hline \end{array}$$

(v) 37256 + 28645

(vi) 85647 + 24632

(vii)
$$\begin{array}{r} 1\,2\,4\,8\,5 \\ 2\,3\,4\,2\,6 \\ +\,1\,7\,3\,2\,5 \\ \hline \end{array}$$

(viii)
$$\begin{array}{r} 4\,2\,6\,3\,9 \\ 8\,8\,4\,2\,1 \\ +\,5\,6\,7\,8\,2 \\ \hline \end{array}$$

3. Answer of the following questions.

i. Sabina's family spent Rs. 15,550 on rent and Rs 25780 on food. Find the total amount spent in rent and food.

ii. Samjhana earns Rs. 48,950 monthly from her shop and Rs. 15,280 from agriculture farm. Find the total income of Samjhana altogether.

iii. Simran buys a home in Rs. 7,52,000. She spend Rs. 25650 for the maintenance of the home. Find her total expenses altogether.

iv. A shopkeeper buys a computer for Rs. 25,680 and sell it at a gain of Rs. 5,320. At what price and he sell the

computer?

v. A shopkeeper sold an article at Rs. 15,280. By selling the article he loses Rs. 3520. Calculate the buying cost of the article.

vi. There are 58760 females and 75280 males in a municipality. Find the total population of the municipality.

vii. The table below shows the population distribution of a municipality. Study the following table and answer the questions that follow:

Senior citizens	Youth	Children
28,250	42,000	36,445

i. Find the total population of senior citizens and youths.

ii. Find the total population of youths and children.

iii. Find the total population of the municipality.

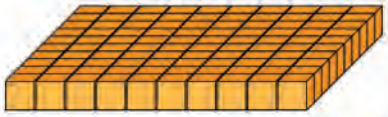
viii. Sushant deposited Rs. 75,780 at a bank during the first month. He deposited Rs 15,233 more in the second month than he did in the first. Find the total amount of money deposited altogether.

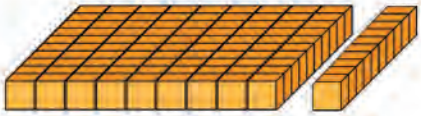
ix. There are 1726 entrance ticket sold from the ticket counter till 11:00 AM. From 11:00 AM to 5 P.M 8003 tickets are sold. Find the total number of tickets sold altogether on that day.

5.3. Subtraction

Activity 1

From the blocks given below 10 blocks are removed. Find, how many blocks are left?





There are a total of 100 blocks. After removing 10 blocks, there are 90 blocks remaining.

Mathematically,

100-10=90

And 90+10=100. This is how the addition and subtraction are related.

There are 40 marbles in the plate given below. If 30 marbles are removed from the plate, how many marbles will be left at the plate?

If we remove 30 marbles from the plate, then 10 marbles will be left at the plate. In mathematical sentence,

40 - 30 = 10. 30 + 10 = 40.

The process of subtraction is explained using terms like eliminating, taking out, and choosing out from a group of things. The outcome of subtraction can be checked.

Activity 2

Make a subtraction problem and ask a friend to solve it. Get a similar problem from the friend and solve it. Discuss the results of the problems in the class.

Example 1

Sarala went to the market. She had Rs. 58437. She spent Rs. 45,326 at the market. Find the money she had left over after she finished her shopping.

Solution:

The amount of money Sarala had:

Rs. 58,437	
Rs= 45,326	?
Money spent at shopping	left over

Mathematically,

Rs= 58,437 - Rs= 45,326

Subtracting using place value table,

	ten thousand	thousand	hundred	ten	one
	5	8	4	3	7
-	4	5	3	2	6

7 one – 6 one = 1 one
3 ten – 2 ten = 1 ten
4 hundred – 3 hundred = 1 hundred
8 thousand – 5 thousand = 3 thousand
5 ten thousand – 4 ten thousand = 1 ten thousand

	ten thousand	thousand	hundred	ten	one
	5	8	4	3	7
-	4	5	3	2	6
	1	3	1	1	1

Checking the result,

45,326
+ 13,111
58,437

Example 2

How much it will be when 26132 is subtracted from 98763

Solution:

$$\begin{array}{r} 9\ 8\ 7\ 6\ 3 \\ -\ 2\ 6\ 1\ 3\ 2 \\ \hline 7\ 2\ 6\ 3\ 1 \end{array}$$

Checking the result

$$\begin{array}{r} 2\ 6\ 1\ 3\ 2 \\ +\ 7\ 2\ 6\ 3\ 1 \\ \hline 9\ 8\ 7\ 6\ 3 \end{array}$$

∴Our calculation was correct.

Example 3

Harinarayan receives Rs. 68,325 as a salary and allowances from the bank per month. He spends Rs. 39,576 in school fees and travelling. He saves the remaining amount. Find the amount he saves per month.

Solution:

Harinarayan's Income	Rs. =68,325
Rs. 39,576	
Harinarayan's Expenditure	Remaining saving amount

Mathematically,

Rs. 68,325 - 39,576

Subtracting using place value table,

	ten thousand	thousand	hundred	ten	one
	6	8	3	2	5
-	~~3~~	~~9~~	~~5~~	~~7~~	~~6~~

	ten thousand	thousand	hundred	ten	one
	5	17	12	11	15
	6	8	3	2	5
-	3	9	5	7	6
	2	8	7	4	9

5 cannot be subtracted from 6. Let's Borrow 1 ten from the place of 10. It makes a total of 5+10=15.
Similarly, in the place of ten, 7 cannot be subtracted from 1. So, lets borrow 1 hundred= 10 ten from the place of Hundred. Now the total tens become 1+10=11.
Similarly, in the place of hundred, 5 cannot be subtracted from 2. So, lets borrow 1 thousand= 10 hundred from the place of thousand. Now the total hundred become 2+10=12.
Similarly, in the place of thousand, 9 cannot be subtracted from 7. So, lets borrow 1 thousand= 10 hundred from the place of thousand. Now the total hundred becomes 7+10=17 and finally 5 is left in the place of ten thousand.

Checking the results,

$$\begin{array}{r} 3\ 9\ 5\ 7\ 6 \\ +\ 2\ 8\ 7\ 4\ 9 \\ \hline 6\ 8\ 3\ 2\ 5 \end{array}$$

∴Hence, our calculation was correct. So, Harinaryan's saving of the month is Rs. 28,749.

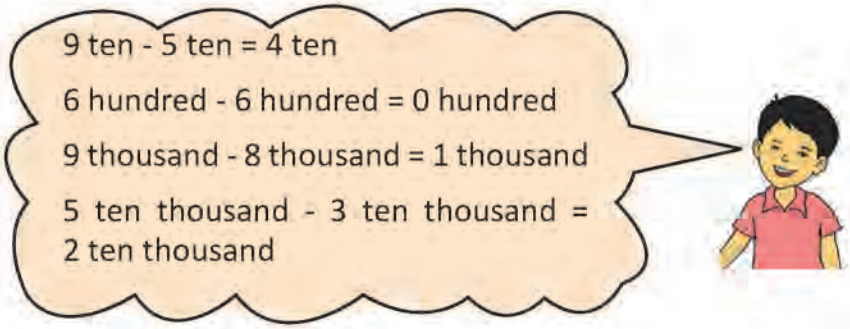
Example 4

In the election of the federal parliament. There were 59,700 valid votes cast. How many votes were granted to the opposition if the winning candidates received 38654 votes?

$$\begin{array}{r} \ \ \ \ 9 \\ \ \ 6\ 10\ 10 \\ 5\ 9\ 7\ \cancel{0}\ 0 \\ -\ 3\ 8\ \cancel{6}\ \cancel{5}\ \cancel{4} \\ \hline 2\ 1\ 0\ 4\ 6 \end{array}$$

Digit 4 cannot be subtracted from 0. We have to borrow 1 ten from the place of 10. But the place of ten itself has 0. So, borrowing 1 hundred= 10 tens from the place of Hundred to the place of ten. So, 6 will be remained in the place of hundred

Now, the total tens become 0+10=10 tens. Borrowing 1 ten from the place of ten. 9 ten will be left in the place of ten.

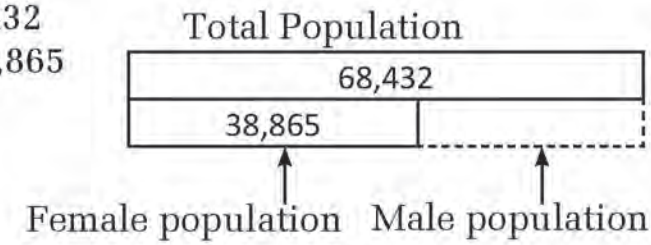


The subtraction above is called subtraction by borrowing. If we have to subtract a bigger digit from the smaller one, we have to borrow 1 from the one place higher. If the borrowing is not possible from one place higher, we have to borrow from two place higher and then subtract. This type of question is discussed in the previous example.

Example 5

There are 68432 people in a town. The female population of the town is 38865. Find the population of male.

Solution:
Total population = 68,432
Female population = 38,865
Male population = ?



$$\begin{array}{rrrrrr} & 5 & 17 & 13 & 12 & 12 \\ & \not{6} & \not{8} & \not{4} & \not{3} & \not{2} \\ - & 3 & 8 & 8 & 6 & 5 \\ \hline & 2 & 9 & 5 & 6 & 7 \end{array}$$

Checking the answers

$$\begin{array}{rrrrrr} & 3 & 8 & 8 & 6 & 5 \\ + & 2 & 9 & 5 & 6 & 7 \\ \hline & 6 & 8 & 4 & 3 & 2 \end{array}$$

∴Hence, the male population of the town is 29567.

Example 6

Pramila's monthly salary is Rs 42500. Sarala's monthly salary is 35800. How much is Sarala's salary lower than Pramila's?

Solution

Mathematically

42,500 - 35,800 = ☐

pramila's salary

Rs. 42,500	
Rs. 35,800	

Sarala's salary | difference on salaries

Subtracting,

$$\begin{array}{r} 4\ 2\ 5\ 0\ 0 \\ -\ 3\ 5\ 8\ 0\ 0 \\ \hline 0\ 6\ 7\ 0\ 0 \end{array}$$

checking the solution,

$$\begin{array}{r} 3\ 5\ 8\ 0\ 0 \\ +\ \ 6\ 7\ 0\ 0 \\ \hline 4\ 2\ 5\ 0\ 0 \end{array}$$

∴Hence, Pramila's salary higher than Sarala's by 6,700

Example 7

The central zoo in Jawalakhel sold 15,367 tickets on Saturday in the first week of Mangshir. The number of tickets sold on Saturday in the third week of the same month is down by 1089 when compared to the first week. Determine the number of tickets sold on the third week's Saturday.

Solution

Mathematically

15,367 – 1089 = ☐

tickets sold in first week

15,367	
1089	

Sales of tickets decreased by | sales in third week

Subtracting,

$$\begin{array}{r} 1\ 5\ 3\ 6\ 7 \\ -\ \ 1\ 0\ 8\ 9 \\ \hline 1\ 4\ 2\ 7\ 8 \end{array}$$

Checking answer,

$$\begin{array}{r} 1\ 4\ 2\ 7\ 8 \\ +\ \ 1\ 0\ 8\ 9 \\ \hline 1\ 5\ 3\ 6\ 7 \end{array}$$

∴Hence, the number of tickets sold on the third week's Saturday is 14,278.

Example 8

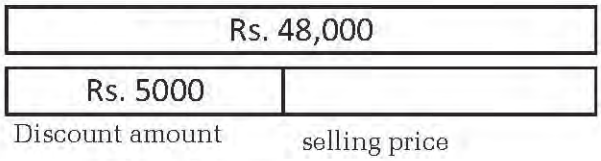
An article that costs 48000 was sold by allowing a discount of Rs. 5000. Find out the price it was sold for.

Solution

Mathematically

48,000 - 5000 = ☐

Costs of article



Subtracting,

$$\begin{array}{r} 4\ 8\ 0\ 0\ 0 \\ -\quad 5\ 0\ 0\ 0 \\ \hline 4\ 3\ 0\ 0\ 0 \end{array}$$

Checking answer

$$\begin{array}{r} 4\ 3\ 0\ 0\ 0 \\ +\quad 5\ 0\ 0\ 0 \\ \hline 4\ 8\ 0\ 0\ 0 \end{array}$$

∴Hence the article was sold for Rs. 43,000

Exercise

1. Find the missing digit in the following calculation

(i) $\begin{array}{r} 5\ 2\ 6 \\ -\,4\ 1\ 5 \\ \hline 1\ \ldots\ 1 \end{array}$ (ii) $\begin{array}{r} 9\ 5\ 5 \\ -\,4\ 6\ \ldots \\ \hline 4\ \ldots\ 2 \end{array}$ (iii) $\begin{array}{r} \ldots\ 6\ \ldots \\ -\,2\ \ldots\ 4 \\ \hline 6\ 2\ 5 \end{array}$

(iv) $\begin{array}{r} 4\ \ldots\ 8 \\ -\,\ldots\ 2\ \ldots \\ \hline 2\ 3\ 6 \end{array}$ (v) $\begin{array}{r} 4\ \ldots\ 3\ 2 \\ -\,3\ 9\ \ldots\ 2 \\ \hline \ldots\ 0\ 2\ 0 \end{array}$

2. Answer the following questions.

I. Find the number to be subtracted from 650 to make it 310.

II. Find the number that should be added to 180 to make it 290.

3. Shivam broke his piggy bank on his birthday. He found a total of Rs. 4383 collected in the piggy bank. Then,

i. Shivam's father thanks him for saving money. His father added some money to his saving. If the total money became Rs. 5200, then find the money added by his father.

ii. Shivam spent Rs. 495 on chocolates after his father gave him money. How much money is left with Shivam now?

iii. Shivam later deposited Rs. 555 in the children's fund. How much money is left with Shivam finally?

4. Sujan has Rs 32850. He spent Rs. 28,225 to buy a television. Find the remaining amount of money with Sujan after purchasing a television.

5. Subtract and check your results.

(i) $\begin{array}{r} 87543 \\ -\ 54231 \\ \hline \end{array}$ (ii) $\begin{array}{r} 94537 \\ -\ 28758 \\ \hline \end{array}$ (iii) $\begin{array}{r} 54832 \\ -\ 47951 \\ \hline \end{array}$

(iv) $\begin{array}{r} 55264 \\ -\ 48585 \\ \hline \end{array}$ (v) $\begin{array}{r} 58070 \\ -\ 39893 \\ \hline \end{array}$ (vi) $\begin{array}{r} 33000 \\ -\ 28538 \\ \hline \end{array}$

(vii) $\begin{array}{r} 50000 \\ -\ 38976 \\ \hline \end{array}$ (viii) $\begin{array}{r} 80000 \\ -\ 69873 \\ \hline \end{array}$ (ix) 65260 – 28870

(x) 98010 – 79855

6. Answer the following questions

i. There are a total of 1480 students in a school. Among them, there are 862 boys. Find the number of girls.

ii. Salman bought an item at Rs. 23,250. He sold it at Rs. 28,580. Find the profit earned by Salman.

iii. Ritu bought an item at Rs. 23,250. She sold it at Rs. 28,580. Find the loss beared by Ritu.

iv. A television costs Rs. 25,480. If a shopkeeper sold it at a discount of Rs. 4280, then find the selling price of the television.

v. Samjhana's father had Rs. 68280 in his bank account. If he withdraws Rs. 12,876 from the bank account, find the amount left in his bank account.

vi. Barsha's family has a monthly income of Rs. 32468 and the monthly expenses of Rs. 28,665. Find their monthly saving.

vii. The sum of the two numbers is 68250, if the first number is 24,380, find the second number.

viii. What should be added to 4230 to make it 6240.

ix. Nagdhunga Police Post keeps the record of the vehicles entering Kathmandu Valley. The record shows that the number of vehicles entered till a day ago was 25,314. On the next day, the record increased to 46,987. Find the number of vehicles entered the next day.

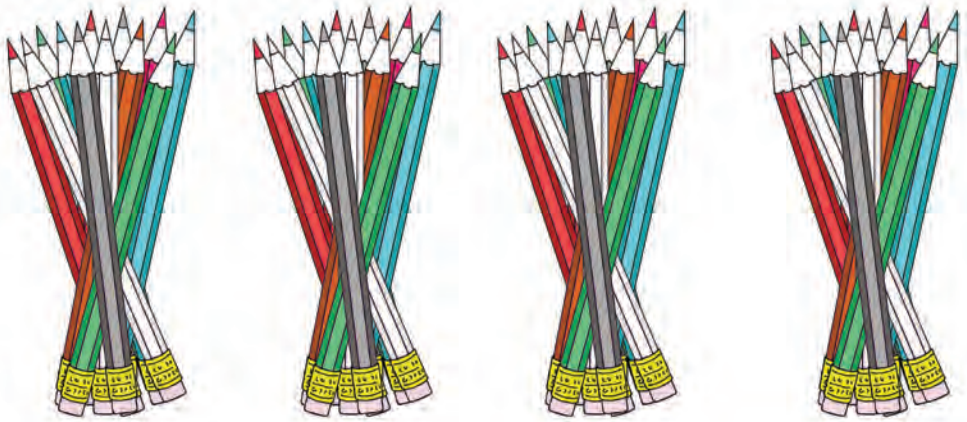
x. Jagannath's salary is less than that of Ganesh's salary by Rs. 8760. If Ganesh's salary is 52316, then find Jagannath's salary.

xi. A basic level school has Rs. 5,32,460 in its bank account. The school distributed one month's salary to its staff. Rs.2,95,205 is left in their bank account after distributing their salary. Find the school's expenses for the salary.

5.4 Multiplication

Activity 1

Mina's mother bought 4 dozen pencils for Mina. Her mother asked Mina about the total number of pencils purchased.
To find the number of pencils Mina put them in the groups of twelve as shown below.

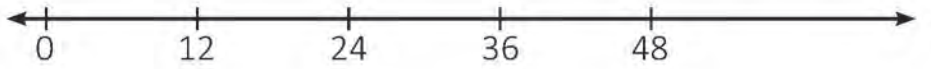


Total pencils = 12 + 12 + 12 + 12

= 48

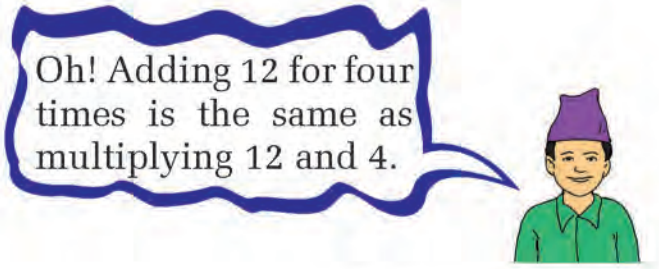
If you were Mina, how would you calculate?

Above problem can be solved in the following ways.



Here,
There are 4 times 12 pencils so, expressing it in terms of multiplication.

So total pencil = 48

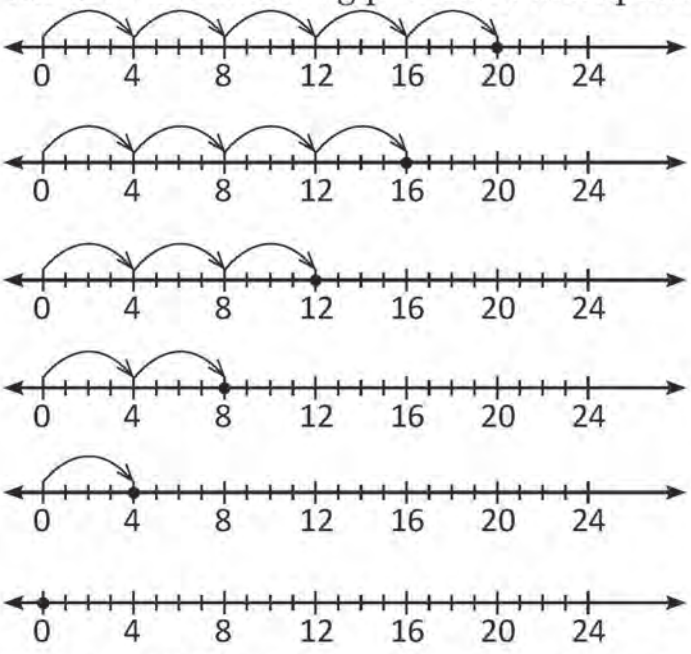


Activity 2

Look at the multiplication table and discuss

Multiplications	Presenting in figure
4 x 5	
4 x 4	
4 x 3	
4 x 2	
4 x 1	
4 x 0	

Observe the following pattern of multiplication using number line



The multiplication pattern is $4 \times 0 = 0$

The multiplication of any number with zero is always zero.

Example 1

The charity organization distributed Rs. 935 per-person to the 142 flood victims. Find the total amount distributed to the victims.

Solution

One of the charity organizations distributed Rs. 935 per-person to the 142 flood victims. To find the total amount distributed, 935 should be added for 142 times. But the addition is same as multiplying 935 and 142. So, multiplying we get,

$$\begin{array}{r} 935 \\ \times\ 142 \\ \hline 1870 \\ 37400 \\ +\ 93500 \\ \hline 132770 \end{array}$$

Adding all of the products

Multiplying 935 by two ones

$$\begin{array}{r} {\scriptstyle (1)(1)} \\ 935 \\ \times\ 2 \\ \hline 1870 \end{array}$$

Multiplying 935 by 4 tens

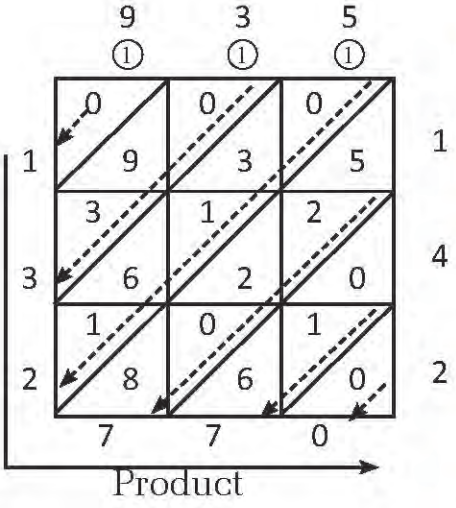
$$\begin{array}{r} {\scriptstyle (1)(2)} \\ 935 \\ \times\ 40 \\ \hline 37400 \end{array}$$

Multiplying 935 by 1 hundred

$$\begin{array}{r} 935 \\ \times\ 100 \\ \hline 93500 \end{array}$$

∴ The charity organization distributed a total of Rs. 1,32,770 to the flood victims.

Multiplying using lattice method



$\therefore$ 142 x 935 = 1,32,770

Thus, Rs. 1,32,770 distributed.

Each cell is splited into two sections, the lower representing ones and the top representing tens. The result of multiplying 2 and 5 is 10. 1 is written at the top and 0 is written at the bottom part of the cell. The product of 2 and 3 is 6. W As a result, we put a 0 in the upper part and a 6 in the below part. The direction of the arrow is used to find the total. The carryover digit is encircled on the top row. The final answer is obtained collecting digits of outside following the arrow.

Example 2

A book costs Rs. 220. How much would be the cost of 37 such books?

Solution

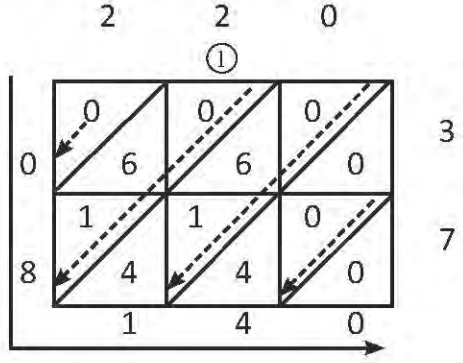
Mathematically

220 × 37 = ☐

Multiplying we get

$$\begin{array}{r} 220 \\ \times\ 37 \\ \hline 1540 \\ +\ 660 \\ \hline 8140 \end{array}$$

Multiplying using lattice method,



$\therefore$ The price of 37 such books is Rs. 8,140.

Exercise

1. Fill in the blanks.

i. The price of an exercise book is Rs. 20. The price of 5 such exercise book = Rs.....

ii. A packet contains 12 pencils. There are ..... pencils in 6 such packets.

iii. The price of one kg grapes is Rs. 320. The price for 8 kg grapes is .....

iv. One minutes has 60 seconds. There are .....seconds in 10 minutes.

v. One week has 7 days. There are .....days in 12 week.

2. Multiply.

(i) 122 × 243

(ii) 220 × 112

(iii) 965 × 420

(iv) 868 × 560

(v) 520 × 400

(vi) 668 × 495

(vii) 280 × 570

(viii) 735 × 648

(ix) 534 × 68

(x) 632 × 97

3. Solve the following questions

i. A box of sweets contains 135 sweets. How many sweets are there in 115 similar boxes?

ii. Tomato plants are planted in rows in an agricultural farm. A row has 125 plants planted in it, and there are 165 rows in all. Calculate the total number of plants that have been planted in the farm.

iii. A school plans to take 135 students from classes 4 and 5 to a picnic. It has been agreed to collect Rs 650 from each student. Determine the total amount of money to be collected. By how much tens is the coflected amount more than one lakh?

iv. There are 125 crates of apples in a fruits market. Each crate contains 110 apples, find the total number of apples in the crate. By how much more are the total apples in the crates than 10,000?

v. A book contrains 220 pages. Find the total number of pages in 312 such books.

Project work

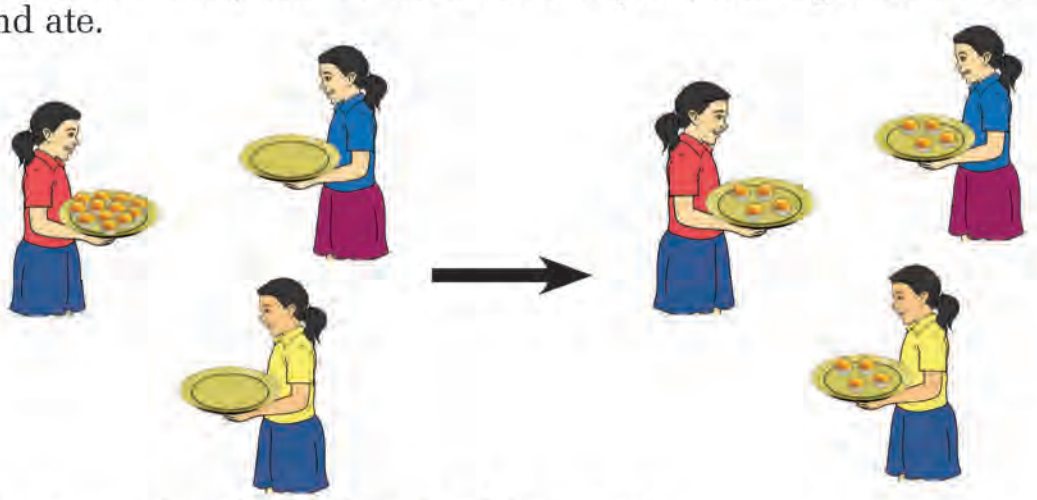
The table below shows grocery items purchased by Ramesh family in a month (including the rate and quantity). Find the total monthly expenditure of Ramesh's family.

Items	Quantity	Unit price	Total price
Rice			
Oil			
Sugar			
Salt			
Milk			

5.5 Division

Activity 1

Dolma, Dhaniya, and Sarita are best friends. They all sat together for tiffin. Dhaniya takes out her tiffin box. Her tiffin box contains 12 Laddus. They shared the Laddus equally among themselves and ate.



How many Laddus did each of them eat?

Dhaniya gave out Laddus to her friends one by one till the Laddu was finished. Each of them got 4 Laddus. The 4 Laddus were distributed in three position. So, $4 \times 3 = 12$.

How many Laddus were distributed in the first round of distribution among them? How many distribution rounds are necessary to finish the Laddus in the box?

In the first round of distribution, three Laddus were distributed. Distributing 1 Laddus to each of them will decrease the number of Laddus by 3 in each round from the box.

$12 - 3 = 9$ First round
$9 - 3 = 6$ Second Round
$6 - 3 = 3$ Third Round
$3 - 3 = 0$ Fourth Round

There are four rounds of subtraction.

In this way, every time the number of Laddus was decreased by 3. In 4 rounds of distribution, the Laddus were finished.

In short, it can be done as

$$3\overline{)12}\ 4,\quad -12,\quad 0$$

The number of times 3 can be subtracted from 12 is 4.

This is how 12 laddus divided among three people results in four laddus in each person.

Here 3 is called the divisor, 4 is called the quotient, and 12 is called the dividend. The result of the division can be checked using following relation:

Dividend = divisor × quotient + remainder

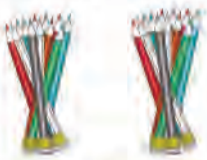
or, $12 = 3 \times 4 + 0$

or, $12 = 12$ (equal result)

The division is the short form of repetitive subtraction.

Activity 2

Krishna, Rajan and Saroj are three brothers. Their father has



bought 2 dozens of pencils for them. They must distribute the pencils equally among them.They start figuring out how many pencils each of them gets.

Saroj : We will get 8 pencils each.

Krishna : How is it?

Saroj : Because $8 \times 3 = 24$

Rajan : Oh! Distributing 24 pencils equally among 3 people is equivalent to finding a number that multiplies by 3, resulting in the answer 24. Is not it?

$\square \times 3 = 24$ $\qquad$ $\boxed{8} \times 3 = 24$

Activity 3

378 copies are distributed among 11 people equally. Find the number of copies each person gets. How many copies are left after distributing equally? In this question, 11 is the divisor and 378 is the dividend. First of all, let's put divisor and dividend as shown below.

$$11\overline{)378}$$

Before the division, we have to construct the multiplication table of the divisor. The multiplication table of 11 is given on the right.

Multiplication table		
11×1	=	11
11×2	=	22
11×3	=	33
11×4	=	44
11×5	=	55
11×6	=	66
11×7	=	77
11×8	=	88
11×9	=	99
11×10	=	110

Therefore we should take the two digit of the highest place of the divisor and see how many times it divides. Now, let's look at the multiplication table to see how many times 37 is divided. 4 times 11 is 44 which is greater than 37. Therefore 33 is 3 times 11 so subtracting 33 from 37 gives 4. Stepping down 8 will makes it 48.

Similarly, Look for the values in the table(i.e. 44) which is less than or equal to the number taken from the dividend (i.e. 48). As 4 times 11 is 44 so subtracting 44 from 48 gives 4 again.

$$\begin{array}{r} 34 \\ 11\overline{)378} \\ \underline{-33}\downarrow \\ 48 \\ \underline{-44} \\ 4 \end{array}$$

As the remaining 4 is not divisible by 11, it is the remainder. 34 is the quotient. When 378 copies are distributed among 11 people equally, each person will get 34 copies and 4 copies will be leftover.

How would we know whether the work we've done so far is correct?

We use the following relation to check our work.

Dividend=divisor×quotient+remainder

Checking the results :

$378 = 11 \times 34 + 4$

or, $378 = 374 + 4$

or, $378 = 378$ ($\therefore$ Values from both sides are equal. Hence, our result is correct.

Example 1

15 pens cost Rs.375. Find the price of a pen.

Solution:

To find the price of one pen Rs. 375 should be divided by 15.

So, dividing, we get

$$\begin{array}{r} 25 \\ 15\overline{)375} \\ -30\downarrow \\ \hline 75 \\ -75 \\ \hline 0 \end{array}$$

$\therefore$ The price of one pencil is Rs. 25.

Checking the results

Dividend=divisor×quotient+equivalent

or, $375 = 25 \times 15$

or, $375 = 375$

Both sides are equal. Hence, the result is correct.

Example 1

Divide and check your result.

$162 \div 18$

Dividing,

$$18\overline{)162}\ 9$$
$$-162$$
$$6$$

9 divisor; 6 remainder

Checking the result

Dividend = divisor × quotient + remainder

or, $162 = 18 \times 9$

or, $162 = 162$

Both sides are equal. Hence, the result is correct.

Hence the quotient is 9.

Multiplication table		
18×1	=	18
18×2	=	36
18×3	=	54
18×4	=	72
18×5	=	90
18×6	=	108
18×7	=	126
18×8	=	144
18×9	=	162
18×10	=	180

Example 3

Divide and check your result.

$978 \div 36$

Dividing,

$$36\overline{)978}\ 27$$
$$-72$$
$$258$$
$$-252$$
$$6$$

27 divisor; 6 remainder

Checking the result

Dividend = divisor × quotient + remainder

or, $978 = 36 \times 27 + 6$

or, $978 = 972 + 6$

or, $978 = 978$ (Both sides are equal. Hence. the result is correct.)

Multiplication table		
36×1	=	36
36×2	=	72
36×3	=	108
36×4	=	144
36×5	=	180
36×6	=	216
36×7	=	252
36×8	=	288
36×9	=	324
36×10	=	360

Exercise

1. Fill in the blanks

i. Divisor × Quotient + ... = Dividend

ii. Dividend= .....×quotient+Remainder

iii. If 18÷6=3, Divisor=....., Dividend =..... Qutient=.....

iv. If Divisor is 4, Quotient is 5 and remainder is 3 then dividend =.....

v. If Divisor is 3, Quotient is 8 and remainder is 0 then dividend =.....

2. Divide and check your result.

(i) $24\overline{)480}$ (ii) $38\overline{)204}$ (iii) $68\overline{)894}$ (iv) $72\overline{)868}$

(v) $55\overline{)995}$ (vi) 568 ÷ 22 (vii) 654 ÷ 42 (viii) 735 ÷ 23

(ix) 943 ÷ 32 (x) $5\overline{)555}$ (xi) $9\overline{)585}$ (xii) $4\overline{)420}$

3. Answer these question:

i. The sum of Rs. 765 is divided equally among 85 people. How much money does each person receive?

ii. A box can contain 65 chocolates. How many such boxes are needed for 350 the chocolates? How many chocolates will remain?

iii. A bus travels 45 kilometers in an hour. Find the number of hours to travel 675 kilometers at the same speed.

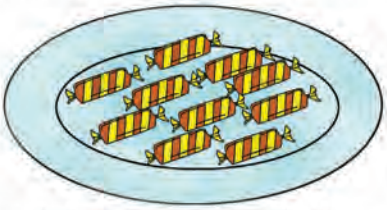
iv. 565 pens are divided equally among 45 students of class 2. Determine the number of pens each student gets. How many pens are left? Find the additional number of pens required so that each student gets 1 more pen.

v. One kilogram of rice costs Rs. 75. How many kilograms of rice can Sushanta buy for Rs. 975? Find the amount of change that Susanta received if he gave the shopkeeper Rs. 1000.

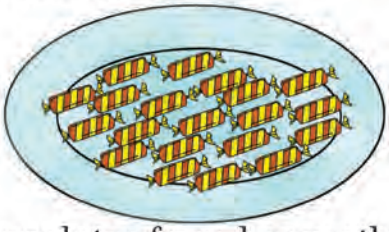
5.6 Simplification

Activity 3

Aakriti received 20 chocolates from her mother and 10 chocolates from her father on her birthday. She gave five chocolates to her brother. How many chocolates are left with her?

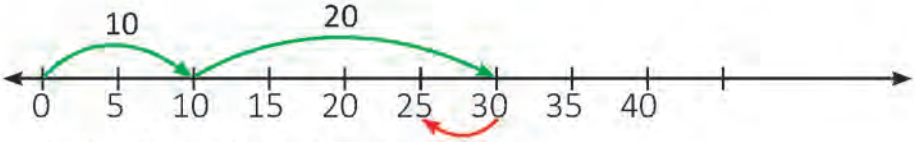


Chocolates from her father



Chocolates from her mother

Let's use the number line to represent the given problem.



She only had 25 chocolates left.
Mathematically,

$$10 + 20 - 5$$
$$= 30 - 5 \text{ (Doing addition first.)}$$
$$= 25$$

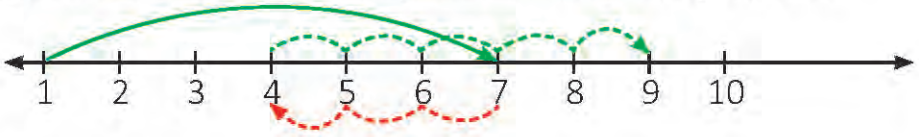
Hence, 25 chocolates are left with her.

Example 1

Suman had seven pencils. As a birthday present, he gave three pencils to his friend Sangita. After a few days, his mother purchased 5 pencils for him. Find the total number of pencils he now has.

Solution:

Using the number line to represent the given problem



Total pencils:

Subtracting first

Hence, he has 9 pencils now.

Exercise

1. Tick (√) for the correct and cross (×) mark for the incorrect expression.

(i) 8 – 2 - 5 = 11 ☐

(ii) 12 – 5 + 3 = 10 ☐

(iii) 15 + 4 - 5 = 12 ☐

(iv) 11 + 12 + 3 = 26 ☐

(v) 8 – 4 + 1 = 5 ☐

2. simplify

(i) 28963 – 38745 + 44444

(ii) 78934 – 25803 – 38768

(iii) 99999 + 8463 – 78923

(iv) 10000 – 3784 + 2835

3. Convert the following verbal statements into mathematical form.

i. Sunita had a total of 10 candies. She gave a candy to each of her six friends. She went out and purchased five more candies. Calculate how many candies she has now.

ii. Radhika had Rs.30 with her. Her father gave her Rs. 45. She bought a copy for Rs. 60. Find how much money is left with her.

iii. Find the result when 5 is subtracted from the sum of 12 and 6.

iv. What is the value if the positive difference of 8 and 5 is added to 3?

v. There are 15 apples in a box. 5 rotten apples are removed from the box and 4 apples are added to the box. Find the number of apples in the box now.

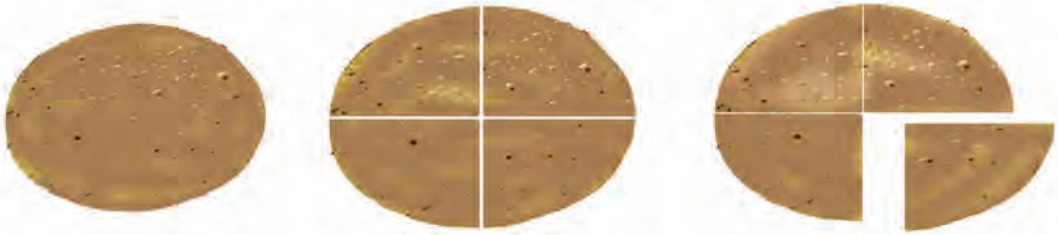
Lesson 6 Fraction, Decimal and Percentage

6.1 Fraction

6.1.1 Review

Activity 1

Salman divided a pancake into four equal parts. He ate one of the parts. How can we express the part eaten by him in fractional form? How we can write the remaining part in fractional form?



Salman ate 1 part out of four equal parts of the pancake. So, the part can be written in fractional form as $\frac{1}{4}$.
Again, there are 3 other parts left.
So, it is 3 numbers of $\frac{1}{4}$

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

Example 1

Ashira bought an 8-equally sliced pizza from a restaurant. She gave 2 slices to her brother. She took 1 slice. The rest of the slices of pizza are kept for her father and mother. Represent the part of pizza eaten by Ashira in fractional form. How can we represent the part of pizza given to her brother in the fractional form?

Solution:

Here, the pizza eaten by Ashira is 1 part out of eight parts. So it is written as $\frac{1}{8}$

Ashira's brother got 2 slices of pizza of same size as Ashira

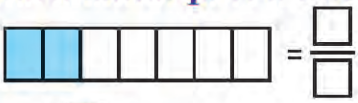
So 2 slices of $\frac{1}{8} = \frac{2}{8}$

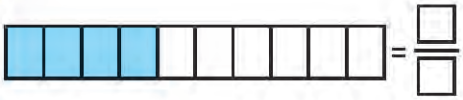
There are 5 slices left. So, 5 slices of $\frac{1}{8} = \frac{5}{8}$

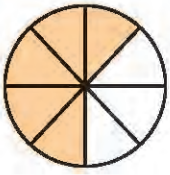
The fraction having 1 in the numerator is called unit fraction. We can describe other fraction easily with the help of unit fraction.

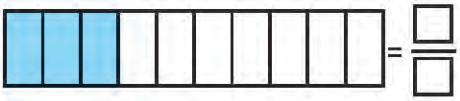
Exercise

1. State the shaded part as fraction.

(i)  = $\frac{\square}{\square}$

(ii)  = $\frac{\square}{\square}$

(iii)  = $\frac{\square}{\square}$

(iv)  = $\frac{\square}{\square}$

(v)  = $\frac{\square}{\square}$

2. Write each of the following statements as fraction.

i. Half = ...

ii. One third = ...

iii. Two third = ...

iv. One forth = ...

v. Two forth: = ...

vi. Three forth = ...

vii. 3 part out of seven part = ...

viii 9 part out of fifteen part = ...

ix. 30 part out of 100 part = ...

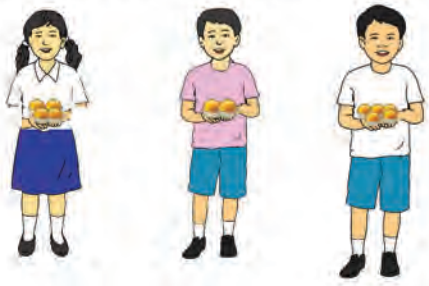
1. **Purushottam served apple pieces to his guests at his home. He took 3 apples and cut them into 4 pieces each. One of the guests took only 2 pieces of apple. Express the part of apple taken by the guest as a fraction of all apples.**

2. **Khilnarayan divided his birthday cake into 12 equal pieces. He gave 2 pieces to his wife, 1 piece to his son, and 2 pieces to his daughter. He ate 2 pieces himself. He put the rest of the pieces in a refrigerator. Express the pieces consumed in the fraction. Also, express the remaining pieces in the fraction.**

6.1.2 Comparison of fractions having equal denominator

Example 1

Sushila, Aman, and John went to the school canteen. They purchased some Laddus. Sushil took the $\frac{4}{11}$ part, Suman took the $\frac{2}{11}$ part, and Rajan took the $\frac{5}{11}$ part of the Laddus purchased. State who had taken the highest and the lowest number of Laddus. Discuss in the class.



Solution:

The number of Laddus taken by Sushila $= \frac{4}{11}$

$= 4$'s $\frac{1}{11}$

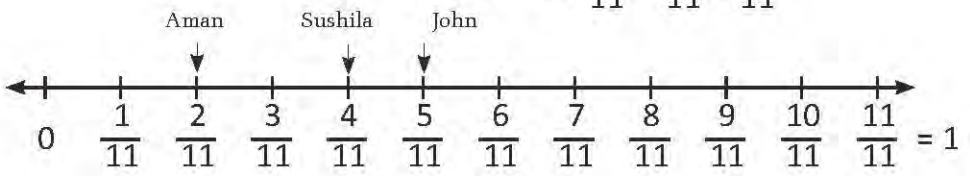
The number of Laddus taken by Aman $= \frac{2}{11}$

$= 2$'s $\frac{1}{11}$

The number of Laddus taken by John $= \frac{5}{11}$

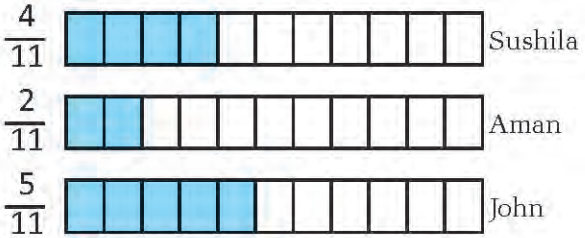
$= 5$'s $\frac{1}{11}$

$= 5 > 4 > 2$ so, $\frac{5}{11} > \frac{4}{11} > \frac{2}{11}$



John had taken the highest number of Laddus and Aman had taken the lowest number of Laddus.

Representing the given information in the diagram,



Here the denominator of the fractions are equal. The shaded part is larger in the figure representing John's part. The shaded part is smaller in the figure representing Aman's part.

So, John ate more Laddus than Aman.

Exercise

1. Put < or > sign in the box in between the fractions.

(i) $\frac{3}{8} \square \frac{7}{8}$

(ii) $\frac{2}{5} \square \frac{1}{5}$

(iii) $\frac{8}{11} \square \frac{4}{11}$

(iv) $\frac{2}{5} \square \frac{3}{5}$

(v) $\frac{1}{6} \square \frac{5}{6}$

2. Arrange the given fractions in ascending order.

(i) $\frac{3}{11}, \frac{8}{11}, \frac{5}{11}$ (ii) $\frac{5}{9}, \frac{1}{9}, \frac{4}{9}$ (iii) $\frac{1}{5}, \frac{4}{5}, \frac{3}{5}$

(iv) $\frac{5}{13}, \frac{1}{13}, \frac{7}{13}$ (v) $\frac{1}{7}, \frac{6}{7}, \frac{4}{7}$

3. Arrange the fractions in descending order.

(i) $\frac{6}{7}, \frac{4}{7}, \frac{5}{7}$ (ii) $\frac{1}{6}, \frac{5}{6}, \frac{3}{6}$ (iii) $\frac{3}{8}, \frac{7}{8}, \frac{5}{8}$

(iv) $\frac{9}{11}, \frac{5}{11}, \frac{10}{11}$ (v) $\frac{4}{5}, \frac{1}{5}, \frac{2}{5}$

4. Solve the following problems.

i. Simran had taken $\frac{2}{5}$ part of a cake in the morning and $\frac{3}{5}$ part of the cake in the evening. At which time did she take more cake?

(ii) A painter painted $\frac{5}{9}$ part of a home on the first day. On the second day, he painted $\frac{4}{9}$ part of the home. On which day did he paint more?

Project work

Riya obtained 95 marks in mathematics examination out of 100, while Saroj obtained 93. Express the marks obtained by them in the fraction. Find who has got more marks. Find out the grades they will obtain with the help of your teacher.

6.1.3 Proper fraction, improper fraction and mixed numerals

Proper and improper fraction

Activity 1

Bhrikuti and Som are discussing on 'fraction' in their class.

Som : Bhrikuti! How can we represent the fraction 5/3 in a shaded diagram? Do you know?

Bhrikuti : I don't know about it but, it may be like this:

Som : If you don't know, let us go and ask our teacher.

Bhrikuti : Yes. (Both of them went to ask the teacher)

Bhrikuti : Sir, how do we represent $\frac{5}{3}$

Teacher : Look here sincerely. First, let us shade $\frac{1}{3}$ How can it be explained? 

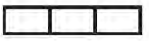
Som : It means one of the three parts, sir.

Bhrikuti : Sir, As it is written $\frac{1}{3}$ It can also be called one $\frac{1}{3}$

Teacher : Okey, tell me again if the shadow is in two parts, how is it expressed?

Bhrikuti : sir! It is two $\frac{1}{3}$ and written as $\frac{2}{3}$ 

Teacher : Now can you show $\frac{4}{3}$ by shadowing?

Som : Bhrukuti! It is only divided into three equal parts. How can we show four $\frac{1}{3}$ 

Teacher : Yes, you are right. It is divided into three equal parts. Add another rectangle to show the fourth. Now, look at this. There are four $\frac{1}{3}$ Both of you,

to show $\frac{5}{3}$ in the shaded diagram.

Som and Bhrikuti : In this case also, two rectangles should be divided into three equal parts each. Now, we have to shade five parts like this. 

Teacher : Yes, you are right. Can you draw any conclusions based on this activity?

Bhrikuti : When the numerator is smaller than the denominator we can represent it directly by dividing a rectangle into equal parts and shadowing the required parts. For example: $\frac{1}{3}$, $\frac{2}{3}$

Som : When the numerator of a fraction is greater than the denominator, dividing a rectangle into equal parts is not enough, another rectangle has to be added, i.e. $\frac{4}{3}, \frac{5}{3}$

Activity 2

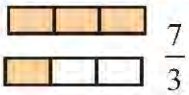
Take some rectangular strips of paper!

Represent $\frac{2}{5}$ and $\frac{7}{3}$ in the shaded diagram.

$\frac{2}{5}$ is a proper fraction. And $\frac{7}{3}$ is the improper fraction.

Discuss in the classroom and draw your conclusion regarding the proper and improper fraction. 

$\frac{2}{5}$



$\frac{7}{3}$

Here, In $\frac{2}{5}$ numerator is less than the denominator. In $\frac{7}{3}$ numerator is greater than the denominator.

Such fractions whose numerator is less than the denominator are called proper fractions. When the numerator is greater than the denominator, the fraction is called an improper fraction. For example: $\frac{2}{5}, \frac{1}{3}, \frac{2}{3}$ are proper fractions and $\frac{7}{3}, \frac{4}{3}, \frac{5}{3}$ are improper fractions.

Example 1

Identify the proper and improper fractions $\frac{5}{6}, \frac{3}{4}, \frac{7}{4}, \frac{8}{5}$ and $\frac{3}{5}$

Solution

Here, in $\frac{5}{6}, \frac{3}{4}$ and $\frac{3}{5}$ numerator is less than the denominator so these are proper fractions. In $\frac{7}{4}$ and $\frac{8}{5}$ numerator is greater than the denominator, so these fractions are improper fractions.

Improper fraction and mixed number

Activity 3

Rina had gone to Pokhara for an educational tour with the 14 students of class IV.
They went to a restaurant for lunch. They were served four pizzas each divided into four slices. Hari was very hungry so he ate a slice of the pizza. Now,they started talking about the pizza.
The topics of discussion were as follows:
How many pizzas did we order?
How do we write in a fraction a slice eaten by Hari?
How about writing the rest of the pizza in a fraction?

Here, they ordered 4 pizzas. Hari ate one-fourth part of a pizza. The eaten portion is written as $\frac{1}{4}$.

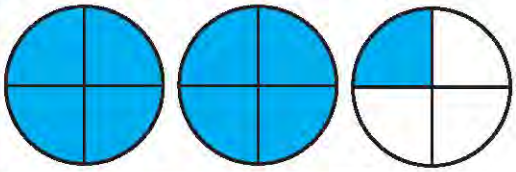
The rest part of the pizza can be written in two ways:
Method 1: Three whole and $\frac{3}{4}$ part of one. Hence it is $3\frac{1}{4}$

Method 2: Each whole pizza is divided into four slices. 15 slices are left. One slice can be written in the fraction as $\frac{1}{4}$

So the rest 15 slices are written as 15 slices of $\frac{1}{4} = \frac{15}{4}$

If the numerator is greater than the denominator, it is said to be the improper fraction. While expressing it in a combination ofa whole number and the fraction is called a mixed number.

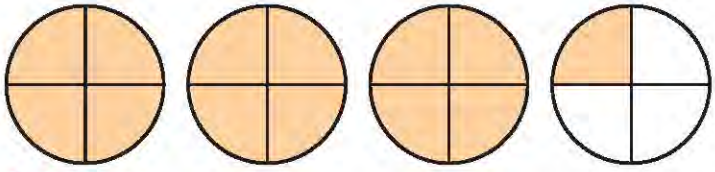
For example, if you write $\frac{9}{4}$ for the shadow part of a given picture, then it is an improper fraction. If you write it as



$2\frac{1}{4}$ then it is a mixed number.

Example 2

Write the shaded part in the picture below in improper fractions and mixed numbers.



Solution:

Here are 13 numbers of $\frac{1}{4}$ So, it is $\frac{13}{4}$ in improper fraction.

Similarly, it has 3 whole and one $\frac{1}{4}$. So the mixed number is

$3\frac{1}{4}$

उदाहरण 3

Identify the proper, improper and mixed number in $\frac{5}{6}$, $3\frac{3}{4}$, $\frac{7}{4}$, $\frac{1}{5}$ and $2\frac{3}{4}$

Solution:

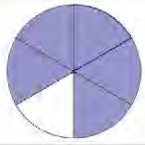
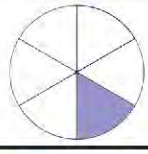
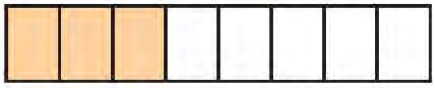
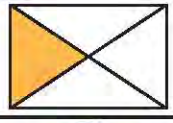
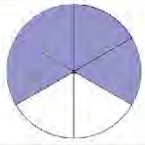
$\frac{5}{6}$ and $\frac{1}{5}$ are proper fractions.

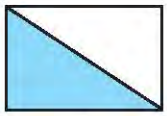
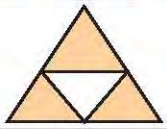
$\frac{7}{4}$ is an improper fraction

Exercise

$3\frac{3}{4}$ and $2\frac{3}{5}$ are mixed numbers.

1. How much does the painted part in the picture below indicate? Choose the correct answer and write on your copy.

1.		$\frac{1}{2}$	$\frac{3}{6}$	$\frac{5}{6}$	$\frac{1}{6}$	$\frac{6}{3}$
2.		$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{5}$
3.		$\frac{1}{2}$	$\frac{3}{8}$	$\frac{1}{6}$	$\frac{1}{7}$	$\frac{6}{8}$
4.		$\frac{1}{3}$	$\frac{3}{6}$	$\frac{1}{2}$	$\frac{1}{5}$	$\frac{1}{4}$
5.		$\frac{4}{5}$	$\frac{5}{6}$	$\frac{4}{5}$	$\frac{1}{6}$	$\frac{3}{5}$

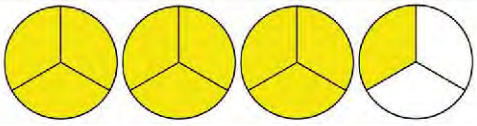
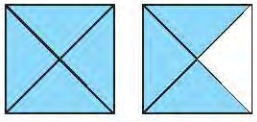
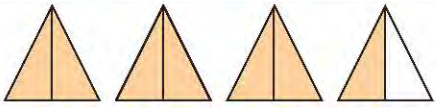
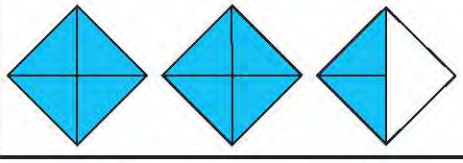
6.		$\frac{1}{3}$ $\frac{1}{4}$ $\frac{1}{2}$ $\frac{1}{5}$ $\frac{2}{1}$
7.		$\frac{1}{2}$ $\frac{3}{4}$ $\frac{5}{6}$ $\frac{1}{4}$ $\frac{4}{3}$
8.		$\frac{1}{6}$ $\frac{2}{3}$ $\frac{3}{3}$ $\frac{1}{3}$ $\frac{2}{5}$
9.		$\frac{3}{5}$ $\frac{3}{4}$ $\frac{5}{4}$ $\frac{4}{6}$ $\frac{4}{5}$

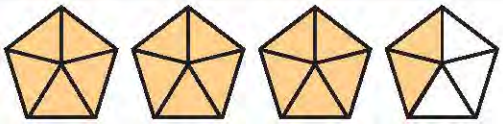
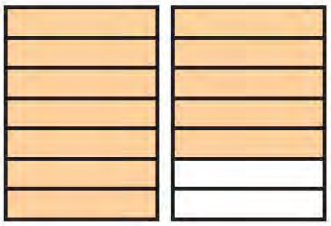
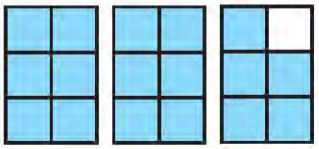
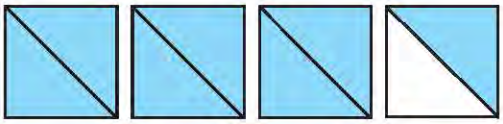
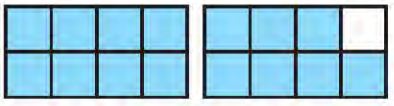
2. Identify the proper fraction , improper fraction and mixed numbers given below.

$2\frac{1}{3}$ $\frac{7}{4}$ $\frac{1}{2}$ $\frac{5}{3}$ $\frac{2}{4}$ $\frac{6}{4}$ $\frac{15}{9}$ $\frac{1}{3}$ $\frac{8}{5}$ $\frac{6}{3}$

3. Write any three examples of each proper fraction, improper fraction and mixed numbers.

4. Write the correct improper fraction or mixed numbers for the shaded part as in the first row of the table.

1.		$\frac{10}{3}$	$3\frac{1}{3}$
2.			
3.			
4.			

5.			
6.			
7.			
8.			
9.			
10.			

6. Make a picture showing the given fraction and fill it with colour.

(a) $1\frac{7}{8}$ (b) $\frac{7}{4}$ (c) $\frac{7}{10}$

Project work)

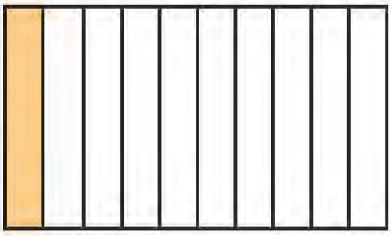
Take rectangular or circular paper strips. Prepare the models of proper fraction, improper fraction and mixed numbers and stick them on the same cardboard paper and present it in the classroom.

6.2 Decimal

6.2.1 Tenths and Hundredths

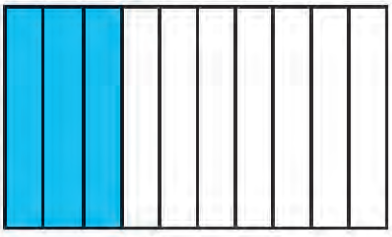
Activity 1

In the first picture on the right, a rectangle is divided into 10 equal parts. One of the part is shaded yellow. The shaded part is written as $\frac{1}{10}$ This is called a tenth. It is written as 0.1 in the decimal. It is read as zero point one.



$\frac{1}{10} = 0.1$

In the second picture, a rectangle is divided in 10 equal parts. 3 of the parts are shaded in blue. The painted part is written as $\frac{3}{10}$ in the fractional form. This is called three tenths. It is written in decimal as 0.3. It can also be presented in the following way.



$\frac{3}{10} = 0.3$

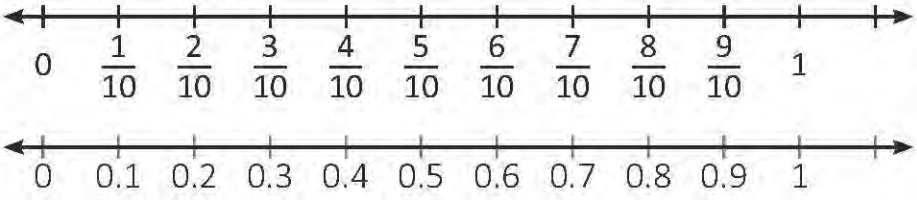
$\frac{1}{10}$ = 1's = 1's 0.1 = 0.1

$\frac{3}{10}$ = 3's $\frac{1}{10}$ = 3's 0.1 = 0.3

Similarly,

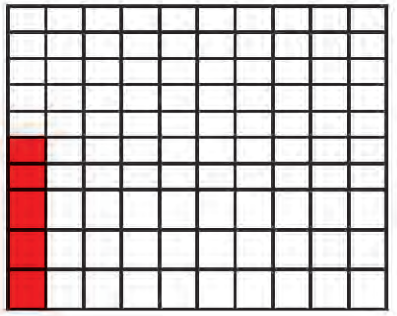
$\frac{4}{10}$ = 4's $\frac{1}{10}$ = 4's 0.1 = 0.4

Representing the numbers in the number line.

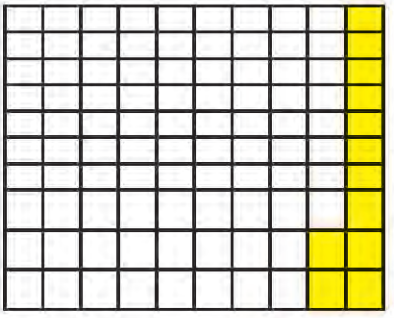


Fractions $\frac{1}{10}$, $\frac{2}{10}$, $\frac{4}{10}$, $\frac{5}{10}$ has 10 in their denominator. So it is called tenth. It is written as 0.1, 0.2, 0.3, 0.4, 0.5. in the decimal.

Activity 2



In the figure on the right, a rectangle is divided into 100 equal parts. 5 parts are shaded with red colour. It is written in fraction as $\frac{5}{100}$ and is called 5 hundredth. In decimal it is 0.05. It is read as zero point zero five. Similarly, in the second figure, 12 parts has been shaded with yellow colour. The shaded part is written in fraction as $\frac{12}{100}$ and read as 12 hundredth. It is written in decimal as 0.12. We read it as zero point one two. There is 100 in the denominator of every one of fractions $\frac{5}{100}$, $\frac{9}{100}$, $\frac{18}{100}$, $\frac{45}{100}$ So, they are called hundredth and written in decimal as 0.05, 0.09, 0.18, 0.45.



The discussion above can be explained as:

$\frac{1}{100}$ = 1's $\frac{1}{100}$ = 1' 0.01 = 0.01

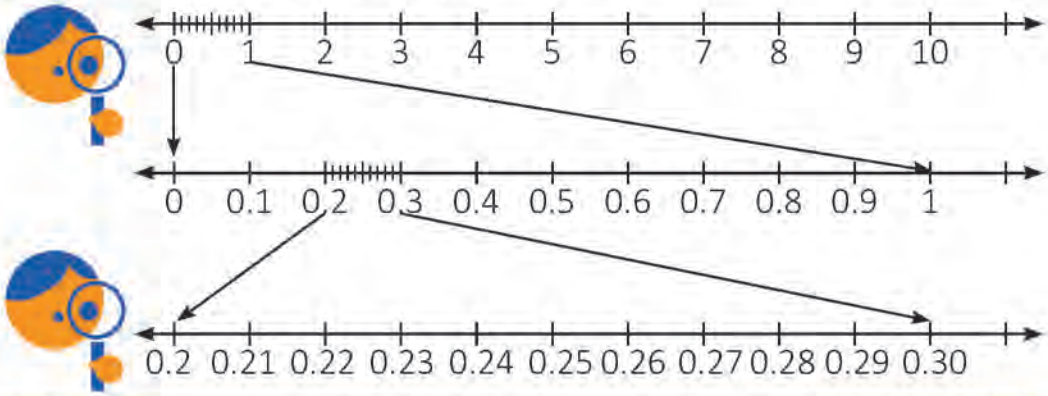
$\frac{5}{100}$ = 5s $\frac{1}{100}$ = 5's 0.01 = 0.05

$\frac{18}{100}$ = 18's $\frac{1}{100}$ = 18's 0.01 = 0.18

Similarly,

$\frac{45}{100}$ = 45's $\frac{1}{100}$ = 45's 0.01 = 0.45

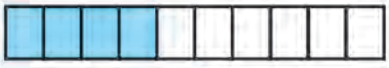
The following number line shows the tenth and hundredth. Study the number line shown below



If the denominator of a fraction is 10, it is called tenth, and if the denominator is 100, it is called hundredth.

Example 1

Write the shaded areas of the diagrams in fractions and decimals

(i) 

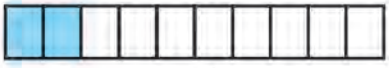
Fraction = $\frac{4}{10}$

Decimal = 0.4

(ii) 

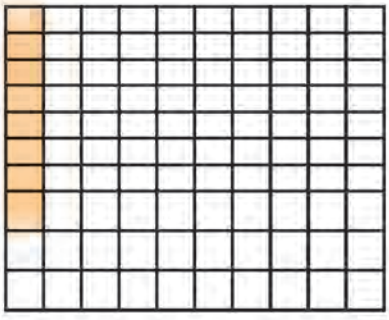
Fractio = $\frac{6}{10}$

Decimal = 0.6

(iii) 

Fraction = $\frac{2}{10}$

Decimal = 0.2

(iv) 

Fraction = $\frac{8}{100}$

Decimal = 0.08

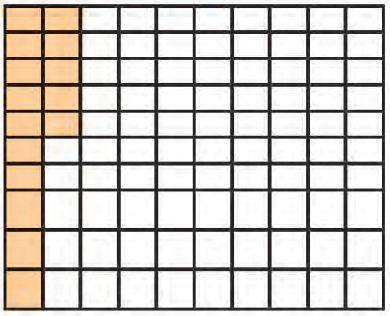
Exercise

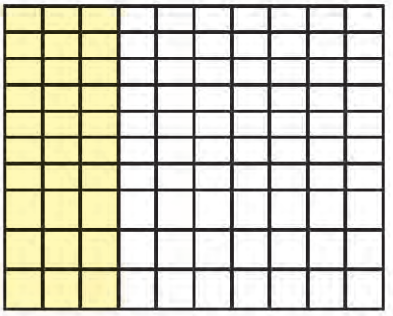
1. Write the shaded areas of the diagrams given below in fractions and decimals.

(i) 

(ii) 

(iii) 

(iv) 

(v) 

2. Convert the fractions given below to the decimal.

(i) $\frac{3}{10}$ (ii) $\frac{8}{10}$ (iii) $\frac{7}{10}$ (iv) $\frac{1}{10}$ (v) $\frac{4}{10}$

(vi) $\frac{3}{100}$ (vii) $\frac{5}{100}$ (viii) $\frac{9}{100}$ (ix) $\frac{25}{100}$ (x) $\frac{48}{100}$

(xi) $\frac{65}{100}$ (xii) $\frac{95}{100}$

3. Write the decimal numbers below in the fraction.

(i) 0.5 (ii) 0.9 (iii) 0.8 (iv) 2.4 (v) 3.5

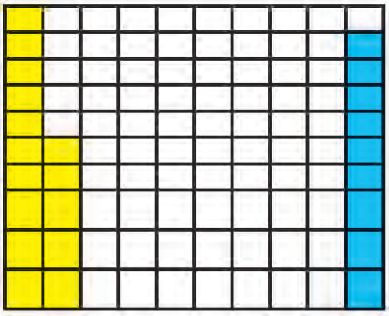
(vi) 0.37 (vii) 0.48 (viii) 0.32 (ix) 0.68 (x) 0.85

(xi) 0.08 (xii) 0.02 (xiii) 0.07

6.3 Percentage

Activity 1

A square piece of paper is divided into 100 equal parts. 15 parts are shaded. The shaded part is written in the fraction as $\frac{15}{100}$ and read as 15 hundredths. In decimal form, it is written as 0.15. Whereas, in percentage, it is 15%. Similarly, nine parts are shaded in blue. When written in fraction, decimal, and percentage, it becomes $\frac{9}{100}$, 0.09, and 9%, respectively.



If the denominator of the fraction is 100, the numerator of the fraction is the percentage. The % symbol is used to indicate the percentage.

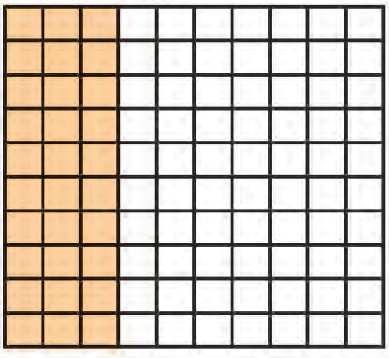
Example 2

Take a square piece of paper. Divide it into 10 equal parts and shade it in three parts, as shown in the figure.How much will the shaded part represent? Express it in fraction and decimal. Certainty, it is written as $\frac{3}{10}$ and 0.3. Now, How do we write it in percentages?

$\frac{3}{10}$ = 0.3

To write in percentage, there should be 100 in the denominator of the fraction. For this, divide the paper from the horizontal side of the square into ten equal parts.

Now, the total number of rooms becomes 100 and 30 rooms will appear to have the shadow. In the fraction and decimal, it is written as $\frac{30}{100}$ and 0.30 respectively. Which is 30% .



Mathematically it is,

$$\frac{3}{10} = \frac{3 \times 10}{10 \times 10}$$

$$= \frac{30}{100}$$

$$= 30\%$$

To make the denominator 100, both numerator and denominator are multiplied by 10.

Example 1

45 out of 100 students in Class 4 of Saraswati Basic School are girls. Express the number of boys and girls in the school in the fractions and percentages.

Solution

Total Student Number = 100

Number of girls = 45

Number of boys = 100 - 45 = 55

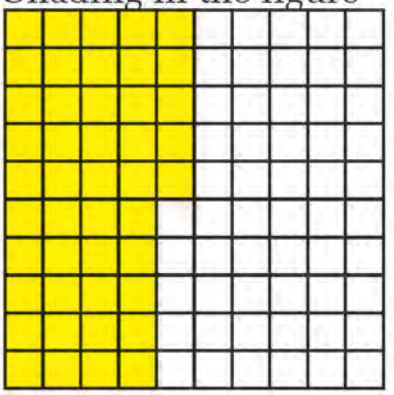
the number of girls in a fraction, $\frac{45}{100}$

the number of boys in a fraction, $\frac{55}{100}$

Writing in percentage,

girl = 45% and boy = 55%

Shading in the figure



Example 2

Salina obtained 6 marks out of 10 full marks in the first-trimester examination in mathematics. Write down the scores she had got in the decimal and percentages.

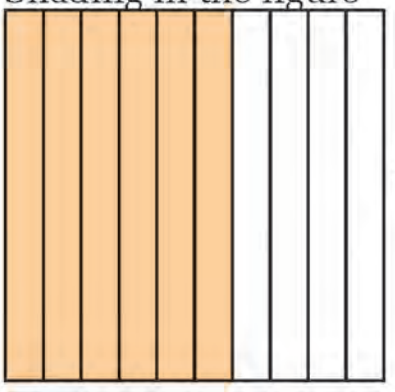
Solutions:

Full marks = 10

Salina scores = 6

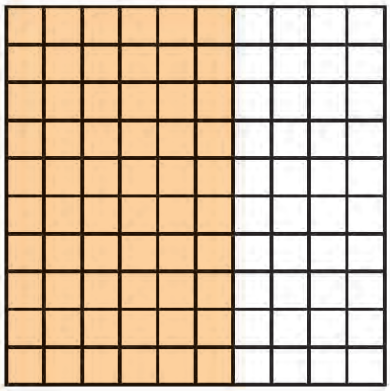
Salina's score in a fraction, $\frac{6}{10}$

Shading in the figure



$\frac{6}{10}$

To convert Salina's score into a percentage, the denominator of the fraction should be made 100. So, the figure is further divided into100 equal parts. The shaded part of the figure represents $\frac{60}{100}$ in the fraction. Therefore, she scored 60% in mathematics.

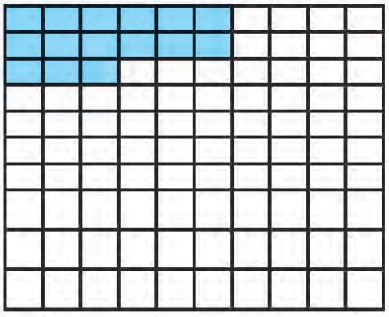


$\frac{60}{100}$

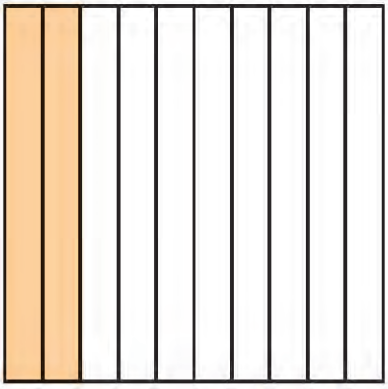
Exercise

1. Write the fractions, decimals, and percentages represented by the shaded part in the figure given below.

(i)



(ii)



2. Write each sentence below in a fraction, decimal and percentage:

i. Hareram has scored 80 marks in mathematics examination of full marks 100.

Marks obtained (in fractional form) =

Marks obtained (in the Decimal form) =

Marks obtained (in the Percentage form) =

ii. In Class 4, there are 45 boys out of a total of 100 students.

Number of boys (in fractional form) =

Number of boys (in the Decimal form) =

Number of boys (in the Percentage form)

iii. Eight of the 100 students in Class 4 are absent.

Absent students (in fractional form) =

Absent students (in the Decimal form) =

Absent students (in the Percentage form) =

iv) A shopkeeper sold an article for Rs.100, he made a profit of Rs. 10.

Profit (in fractional form) =

Profit (in the Decimal form) =

Profit (in the Percentage form) =

v) A shopkeeper gives 1 Rupee discount for an article that costs Rs. 100.

Discount (in fractional form) =

Discount (in the Decimal form) =

Discount (in the Percentage form) =

3. Write each of the following fractions and decimals in percentage:

(i) $\frac{20}{100}$ = ... %

(ii) $\frac{45}{100}$ = ... %

(iii) $\frac{4}{10}$ = ... %

(iv) $\frac{5}{10}$ = ... %

(v) 0.03 = ... %

(vi) 0.15 = ... %

(vii) 0.65 = ... %

(viii) 0.3 = ... %

(ix) 0.35 = ... %

(x) $\frac{98}{100}$ = ... %

4 . Write each of the following percentages in a fraction and decimal:

(i) 25%

(ii) 20%

(iii) 35%

(iv) 75%

(v) 5%

(vi) 3%

Miscellaneous Exercise

1. Circle (O) to the correct answer.

i. Which of the following is correct according to the national system?

(a) 4,5,67, 893 (b) 45,67,893

(c) 4, 567, 8 93 (d) 4,56,78,93

ii. Which of the following is correct according to the national system?

(a) 6,89,34,58 (b) 6,893,458

(c) 689,34,58 (d) 68,93,458

iii. Which number below is the five lakhs five thousand and five?

(a) 505005 (b) 5005005

(c) 500505 (d) 50505

iv. Which of the following numbers is the eight lakhs and eight?

(a) 800 0008 (b) 800080

(c) 800008 (d) 808000

v. How many thousands are there in Ten Lakhs?

(a) 10 (b) 100 (c) 1000 (d) 10000

vi. Which sign below is used in an empty box for the expression $\frac{1}{4} \square \frac{1}{4}$

(a) = (b) > (c) < (d) ≥

vii. Which of the following symbols is used in an empty box for the expression $\frac{9}{13} \square \frac{8}{13}$

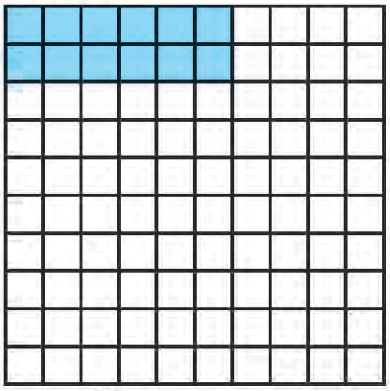
(a) = (b) > (c) < (d) ≥

viii. Which of the following pairs are mixed number and improper fraction?

(a) $\frac{1}{5}$ र $\frac{3}{2}$ (b) $2\frac{1}{5}$ र $\frac{6}{7}$

(c) $\frac{6}{5}$ र $\frac{8}{7}$ (d) $5\frac{2}{3}$ र $\frac{6}{5}$

ix. Which of the following shows the shaded part in the picture below?



(a) $\frac{12}{100}$ (b) 0.12 (c) 12% (d) माथिको सबै

2. Fill the blanks:

i. In 57345, there are .....ten thousands.

ii. There are .....lakhs in the number 846390.

iii. Rounding off 693 to the nearest hundred is .....

iv. Rounding off 883 to the nearest hundred is .....

v. In the fraction, the three quarter is written as .....

vi. In the fraction, a quarter is written as .....

vii. $6\frac{7}{9}$ to an improper fraction is.....

viii. Writing $\frac{9}{10}$ in decimal .....

3. **Write the place value of 6 in the numbers below:**

(i) 526389 (ii) 263893

(iii) 6348007 (iv) 5690003

4. **Use comma as in the national system for the numbers given below.**

(i) 303865 (ii) 4893473

(iii) 6563039 (iv) 635678

5. **A school bank account had Rs.20,00,000 in it. The municipality office transferred Rs. 7,89,563 into the school bank account to pay the teachers' salaries. On the month of Chaitra, the school paid a total salary of Rs. 6,38,689 from its bank account. Determine the remaining funds in the school's bank account.**

6. **The bank account of Shri Janata school at Nepal Bank Ltd had Rs 25,30,638. School paid an advance amount of Rs. 50,000 to the contractor for the construction of toilet. After the completion of construction, school paid additional Rs. 7,12,352 to the contractor. Calculate the amount remained at school account.**

7. **A book has 225 pages. How many pages are there in 200 such books? By how much the total number of pages is less than 50,000?**

8. **There are 8 dozen bananas in a box. How many bananas are there in 125 such boxes? If 15000 bananas are required, calculate the insufficient number of bananas.**

9. **An institution has given 500 copies to the students of class 4. There are 42 students in the class, and copies were distributed equally. How many copies will each of them get? How many copies were remained at school?**

10. Sameer divided his birthday cake in 12 equal parts. He gave $\frac{3}{20}$ part to his friend, Abdul and $\frac{7}{20}$ part to his friend Genial. Who got more part of the cake? And why?

11. Rita divided a cane into 12 equal pieces. She took $\frac{5}{12}$ part. She gave $\frac{7}{12}$ part to Jenny. Who got more part of the cane? And, why?

12. Shovakhar cut his birthday cake as shown below. Look at the figure and answer the questions that follow:

Write the part of cake aten by the son, Shovit and daughter, Shovina in fraction.

Who got more cake?

Find the remaining amount of cake in fraction.

13. Mahendra Gram Secondary School provides lunch to its students upto class 5 at the school. School bought 480 bananas for the students.

i. Each student got 2 bananas. The banana was adequate for the students up to class 5. Find the number of students up to class 5.

ii. A dozen of bananas costs Rs 100. Find the total cost of buying all the bananas.

iii. The school gets Rs. 15 daily for a student for the lunch. Calculate the total amount received by the school for the lunch.

iv. Is the amount sufficient for the day? If not, calculate the deficit/ surplus amount.

14. A school bought a bus for Rs. 2816540.

i. Use commas to express the number in the National system and write it in words.

ii. Write the place and the place value of 8.

iii. The school had Rs. 25,00,000. School took a loan for the insufficient fund to buy the bus. Calculate the loan amount.

15. Janta Secondary School took its 53 students of class 4 for educational tour. The total expense of the tour amounts to Rs. 257580.

i. Use commas to express the number in the National system and write it in words.

ii. Round off the total expense to the nearest hundred.

iii. Calculate the expenses per student for the tour.

iv. The school had collected Rs. 5,000 per student. Calculate the deficit/ surplus amount per student.

Lesson 7 Time

7.1 Review

Discuss the following questions:

i. If the third month according to the Nepali calendar is Asar, what is the tenth month?

ii. What is the number of days in a week and how many days are there in 4 weeks?

iii. How many weeks and how many days are there in 19 days?

iv. How many months are there in 5 years?

v. How many years and how many months are there in 16 months?

Activity 1

This is Rita's watch. On the watch, it is written from 1 to 12. The shortest hand is the hour hand of the clock. It will be 12 hours when the hour hand of the clock makes one complete turn. The longer and the thicker hand of the clock is the minute hand. And, the longer but thinner hand is called the second hand. It takes 60 minutes to make a complete turn.

When the minute hand of the clock makes one complete turn the hour hand goes from one digit to another. It takes 60 minutes to make a complete turn.

Similarly, the second hand of the clock takes 60 seconds to make a complete turn.

So, 1 days=24 hours

1 hour= 60 minutes 1minute= 60 second

Now, the hour hand of the watch shows between 8 and 9, and the minute hand shows the 3. So, the current time shown by the watch is 15 minutes past 8 and written as 8:15.

Similarly, look at the watch at a different time and discuss.

Activity 2

Rita also has a digital watch. The digital watch does not have hands. There are two dots displayed in the middle. On the right of the dots the numbers 01,02,03....to 59 are displayed but not 60. Instead, 1 is added to the left and 00 at the right.

7.2 Conversion of units of time to each other

Activity 1

It takes 15 minutes for Rama to walk from home to school. How can we change it to the seconds? Discuss and present it in the classroom.

One minute is 60 seconds.

Two minutes is $60+60=120$ seconds.

Three minutes is $60+60+60=180$ seconds.

Four minutes is $60+60+60+60=240$ seconds.

How many seconds are there in 5 minutes? Discuss in the class.

Adding like this makes the calculation longer

So,

1 minute has 60 seconds.

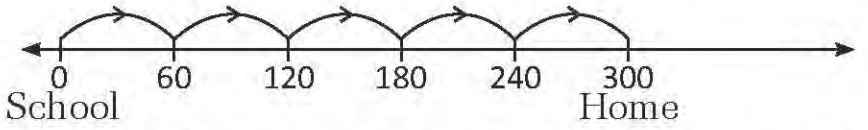
Two minutes have $60+60=60\times2=120$ seconds.

Three minutes have $60+60+60=60\times3=180$ seconds.

15 minutes has $60\times15=900$ seconds.

To convert from minutes to the second, we have to multiply minutes by 60.

It takes 300 seconds for Rama to return home from school. Find the time takenbyrama in minutes. what can be done to convert seconds into minutes?

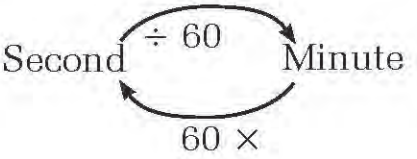


It took 5 minutes for Rama to return home from school.

Here,

60 seconds is equal to 1 minutes.
120 seconds is equals to 120 ÷ 60 = 2 minutes.
180 seconds is equals to 180 ÷ 60 = 3 minutes.
240 seconds is equals to 240 ÷ 60 = 4 minutes.
300 seconds is equals to 300 ÷ 60 = 5 minutes.

To convert seconds into minutes divide it by 60.



We must multiply to convert from higher to lower units, and we must divide to convert from lower to higher units.

Activity 2

Discuss based on the following questions:

i. How many seconds does it take if it takes 5 minutes to you to go from home to the nearest store?

ii. You take 25 minutes to take your lunch. Find the number of seconds it takes.

iii. Rohan and his friends played ball on the school playground for 540 seconds. How many minutes did they play?

Here,

The time to reach the shop is 5 minutes.

1 minutes=60 seconds

1 min= 60 sec

5 minutes = 60×5 seconds =300 seconds

Similar to the questions above ,

The time to eat the lunch=25 minutes.

1 minutes=60 seconds

25 minutes = 60×25 seconds =1500 seconds

The time Rohan and his friends played for=540 seconds to reach the shop is 5 minutes.

60 seconds =1 minutes

540 seconds = 540÷60=9 minutes

Activity 3

The calendar for the year 2078 is given below. Answer the following questions.

(i) How many days and weeks are there in the month of Kartik?

(ii) How many days are there in one year?

(iii) Add the number of days of each month

Normally = 1 year = 365 days but the leap year = 366 days.

Note: In the Nepali calendar months have 29,30,31 and 32 days.

Generally, we consider 1 month = 30 days.

Example 1

It takes Sunita 3 minutes and 20 seconds to cross a distance of 500 m meters by running. Calculate the number of seconds she took to cross the distance.

1 min=60 sec.

Solution:

3 minutes 20 seconds = 3 minutes +20 seconds
= 60×3 seconds +20 seconds
=180 seconds +20 seconds
=200 seconds

Example 2

Convert 180 seconds in minutes

60 sec = 1min

Solution

180 seconds=(60+60+60) seconds
= 3 minutes

180 sec = 180 ÷ 60

60) 180 (3

- 180

0

Thus, 180 second = 3 minutes

Example 3

Convert 200 seconds in minutes

Solution

200 seconds = (60+60+60+20) seconds
= 3 minutes 20 seconds

200 sec = 200 ÷ 60

60) 200 (3

- 180

20

Example 4

It takes three years and 6 days to construct a cooperative building. Find in the number of days, the time to construct the building.

Solution:

1 year = 365 days

3 years = (3 × 365) days = 1095 days

3 years 6 days = 1095 days + 6 days = 1101 days

Example 5

Convert 730 days into year

365 days = 1 year

Solution:

365 days = 1 year

730 days = $\frac{730}{365}$ year = 2 year

Exercise

1. Answer the questions given below.

(i) 6 minutes = ☐ seconds

(ii) 120 seconds = ☐ minutes

(iii) 1095 day = ☐ year

(iv) 8 year = ☐ day

2. Convert the following into seconds.

(i) 15 minutes

(ii) 21 minutes

(iii) 3 minutes 11 seconds

(iv) 14 minutes 30 seconds

3. Convert the seconds into minutes.

(i) 110 seconds

(ii) 320 seconds

(iii) 190 seconds

(iv) 170 seconds

4. Convert months into days and days into months

(i) 11 months 20 days
(ii) 18 months
(iii) 30 months 15 days
(iv) 300 days
(v) 960 days
(vi) 525 days

5. Convert weeks into days and days into weeks.

(i) 42 weeks
(ii) 36 weeks 4 days
(iii) 54 weeks 6 days
(iv) 238 days
(v) 588 days
(vi) 475 days

6. Convert years into days and days into years.

(i) 730 days
(ii) 550 days
(iii) 20 years
(iv) 1095 days
(v) 590 days
(vi) 25 years
(vii) 18 years

7. Dhanesh takes 21 minutes to reach his school from his home. Find the time he takes in seconds.

8. Aahana danced 260 seconds in a cultural program. Calculate the dancing duration in minutes and seconds.

9. Convert 5 years 20 days into days.

10. How many years and days are there in 308 days?

Project work

List out all the activities you have done yesterday from early in the morning to throughout the day. Write the time for each activity in minutes. Convert it into seconds.

7.3 Addition of time

Activity 1

Look at the clock alongside and discuss the following questions:

i. What time is it in the clock?

ii. Where will be the clock hands pointing after 2 hours 30 minutes?

iii. If you add 1 hour 15 minutes at the time after 2 hours 30 minutes time, then where will be the clock hands pointing?

It is 10 minutes past 10 in the clock. To find the time after 2 hours 30 minutes, observe the clock by turning the hands by 2 hours 30 minutes. Where does the hands of the clock pointing? Again turn the hands by one hour 15 minutes. Observe where the clock hands are showing.

Activity 2

Look at the yearly work plan calender of your school and answer the following questions.

i. In this academic year, how many months has the school been open?

ii. How many months are left for the end of this academic session?

iii. How many weeks are there in the remaining months?

iv. The classes run for six hours everyday. Find out how many hours the classes are run in six days.

Example 1

Uttam did his homework for 1 hour and 25 minutes on saturday. He played futsal for 2 hours and 12 minutes. He watched television for 3 hours and 10 minutes. Find out how long it took to complete these tasks.

Solution

Time taken to complete the homework = 1 Hours 25 minutes

Time taken to play Futsal = 2 Hours 12minutes

Time taken to watch television = 3 Hours 10 minutes

Now, the total time taken,

	Hours	minutes
	1	25
	2	12
+	3	10
	6 Hours	47 minutes

It took 6 hours and 47 minutes for Uttam to complete the task.

The same units are added together when we add time. For example hours with hours, minutes with minutes.

Example 2

Arya and her friends started doing their homework at 5:30 in the evening. They finished their homework in 40 minutes. At what time did they finish their homework? Show the time on the clock.

Solution:

The time Arya and her friend started doing homework = 5 Hours 30 minutes

Time to do homework = 40 minutes

You need to add these times to calculate the finishing time,

	5 Hours	30 minutes
		40 minutes
	5	70
+	1	- 60
	6	10

60 min = 1 Hours

Hence, they finished their homework at 10 minutes past 6.

Example 3

Sarina planted some mango trees i nBaishakh, 2075. It began to bear the fruit after two years and 10 months. Find out the month and the year when it began to bear the fruit.

Solution

Time of plantation: = 2075 years 1 month

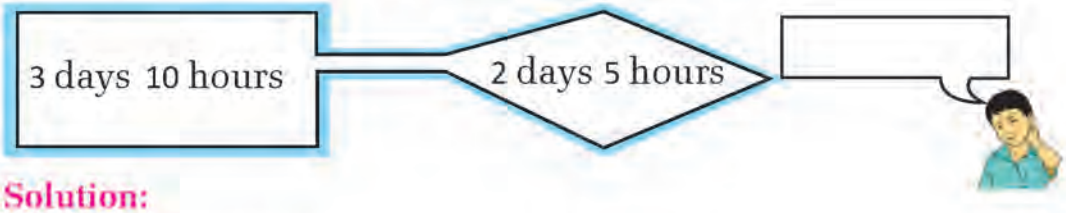
Time to begin to bear the fruit: = 2 years 10 month

	years	month
	2075	1
+	2	10
	2077 years	11 month

∴ The plant began to bear fruit from the month of falgun of 2077.

Example 4

Write the answer in the box.



Solution:

	days	hours
	3	10
+	2	5
	5days	15hours

Hence, 5 days 15 hours should be written in the box.

Example 5

In the year 2076 BS, Ratna Rajya School conducted sports activities for 2 weeks and four days. The other extracurricular activities were conducted for 1 week and 3 days. Calculate how long the activities were conducted?

Solution

Time of sporting activities: = 2 weeks 4 days

Time of other extracurricular activities:= 1 week 3 days

Finding the sum,

week	day
2	4
+ 1	3
3	7
+ 1	
4	0

7 days = 1 week

∴Hence, the program was conducted for 4 weeks.

Exercise

1. Find the sum of the time given below.

(a)

year	month
3	4
+5	2

(b)

year	month
6	7
+9	8

(c)

year	hour
3	12
+5	13

(d)

year	hours
1	14
+2	20

(e)

hour	minute
7	8
+4	12

(f)

hour	minute
2	37
+1	48

(g)

week	day
2	2
+5	4

(h)

week	day
3	5
+2	4

(i)

minute	second
35	25
+10	40

(g)

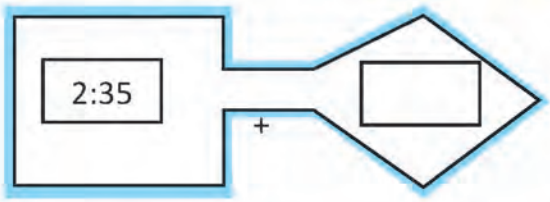
hour	minute	second
3	45	30
+ 4	50	40

(g)

minute	second
45	30
+ 55	25

2. Look at the watch alongside. Find the time after 45 minutes.

3. Write the suitable time in the box.



=

4. Sonam's age at present is 11 years 5 months. Calculate the Sonam's age after 12 years and 2 months.

5. Nilima spends 4 hours and 5 minutes completing homework and the project work on mathematics. She spends 3 hours and 7 minutes completing homework and the project work on Nepali. Find the total time for completion of both works.

6. Basketball players practise for one week and four days during the month of Magh. In the month of Falgun, the players practise for two weeks and five days. Find the total number of days they practise.

7. It took 2 weeks and 2 days for the farmers to construct a plastic tunnel. It took 1 week and 5 days to prepare land and plantation of seedlings. How long does it take to complete all of the work?

Project work

Make a note of all the work you will do next Saturday. How long will it take to do this? Prepare a report on the time it takes to complete the entire task and present it in the classroom.

7.4 Subtraction of time

Activity 1

(a) Math class starting time

(b) Math class ending time

Look at the time indicated by the clocks in the given picture and discuss:

(i) At what time is school over?

(ii) What time did the maths class start?

(iii) The maths class is one hour long. When will the maths class end?

(iv) The physical education class starts at 2:35. Calculate the difference in time between maths class and physical education class?

(v) Calculate the duration of five between the start of maths class and the end of school.

The clock alongside shows that the maths class started at 1:15, so, it ends at 2:15. The school is over at 4:00. To find the time between the physical education class and the maths class,the ending time of the math class should be subtracted from the starting time of physical education class.

For this, let's put the hour and minute in separate columns.

	Hours	Minutes
	2	35
−	2	15
	0	20

There is 20 minutes gap between the completion of the maths class and the start of the physical education class.

To find out the time from the beginning of mathematics class to the school ends; 1:15 should be subtracted from 4:00. The school ending time is only in hours. But,the starting time for mathematics class is in hours and minutes. What can be done to subtract it from hours only?

hours	minutes
3	60
~~4~~	0
− 1	15
2	45

1 hours = 60 minutes
So, borrow 1 hour (60 minutes) from 4 hours Then, subtract 15 minutes.

There are two hours 45minutes left until school ends.
As in the addition of time, only identical units are subtracted in the subtraction of time.

Example 1

Hikesh sat down to watch television at 8:45 in the evening. He watched his favorite program till 10:15. How long did he been watch television?

Solution

The time Hikesh started watching television = 8:45
The time he stopped watching television = 10:15

To find the time between, we subtract

hours	minutes		hour	minutes
10	15		9	60+15 = 75
−8	45	⇒	−8	45
			1	30

He watched television for one hour and 30 minutes.

Example 2

The earthquake of the year 2072 collapsed a school building. The reconstruction of the school building started on 1st Ashwin, 2074. The construction was completed at the end of Chaitra 2077. Calculate how long it took for the reconstruction of the building.

Solution:

The reconstruction of the school building started: 1st Ashwin, 2074
The construction was completed: end of Chaitra 2077

Subtracting,

year	month
2077	12
−2074	5
3 year	7 month

It took 3 years and 7 months to complete the construction.

Example 3

A five days educational tour from Gorkha to Mahendranagar was organized. How many hours of the tour will remain after the completion of 70 hours?

Solution:

5 days = (24×5) hours = 120 hours

Now, the remaining hours = $120 - 70 = 50$ hours

Exercise

1. find the difference in time as indicated below:

(i)

days	hours
6	10
- 4	15

(ii)

hours	minutes
9	48
- 6	50

(iii)

days	hours
12	20
- 8	15

(iv)

days	hours
22	4
- 14	10

(v)

week	days
13	8
- 9	5

(vi)

weeks	days
19	6
- 11	5

(vii)

years	months
15	20
- 10	11

(viii)

years	months
8	12
- 4	11

(ix)

minutes	seconds
34	45
- 16	25

(x)

minutes	seconds
40	20
- 19	45

(viii)

hours	minutes	seconds
5	30	20
- 2	40	30

2. Dorje went to the market at 7:30 in the morning. Dorje returned home at 10:45. Find his shopping hours in the market.

3. **What should be added to 3 years and 6 months to make it 8 years and 7 months?**

4. **Ram took 6 hours 30 minutes to travel from Kathmandu to Pokhara in a minibus.The bus, that left Kathmandu in the morning, reached Muglin in 3 hours and 10 minutes. Find out how long it took to complete the rest of the journey.**

5. **A worker has taken the contract of putting up a wall in 3 weeks 6 days. He worked for 2 weeks and left. Find out how much time is needed for the completion of the work.**

6. **Deepika started doing her homework at 6:45 in the morning. She completed all her homework by 8:30. How long does she take to complete her homework?**

Project work

List out the name of daily used materials. Note their expiry date. Calculate the days left for expiry. Present it in your classroom.

Lesson 8 Currency

8.1 Review

Observe the following notes of Nepali currency

Currencies are in the form of notes or coins. Paisa is the smallest unit of Nepali Currency. 100 paisa make one rupee. We write P for Paisa and Re. 1 for a rupee and Rs. for rupees in short. Discuss how many paisas are there in Rs. 5, Rs. 10, and Rs. 50.

8.2 Multiplication related to money

Activity 1

Rs. 40 per apple

Rs.15 per orange

Rs. 55 per pomegranate

Rs. 10 and 50 Paisa per banana

Discuss the following questions based on the figures above.

i. How much is the cost of 3 apples?

ii. What is the cost of 8 bananas?

iii. What is the total cost of 5 oranges and 3 pomegranates?

iv. If you have Rs. 150, what fruits will you buy? What will be the number of each type of fruit?

Total Cost = Cost of one object × number of objects.

Example 1

Look at the price list of the following food items. Answer the following questions.

Todays' price list	
Food items	**Cost**
Tea	Rs. 20 per cup
Milk	Rs. 25 per cup
Samosa	Rs. 16 per piece
Chowmin	Rs. 60 per plate

Questions

(i) What is the cost of 5 cups of tea?

(ii) What is the cost of 3 pieces of Samosas?

(iii) What is the total cost of 2 cups of milk and two plates of Chowmin?

(iv) What will be the total cost of 6 pieces of Samosas, a cup of tea, and a cup of milk?

Solution

i. The cost of 1 cup of tea is Rs. 20.

The cost of 5 cups of tea is 5× Rs. 20 = Rs. 100

ii. The cost of 1 piece of Samosa is Rs. 16.

The cost of 3 pieces of Samosa is 3× Rs. 16= Rs. 48.

iii. The cost of 1 cup of milk is Rs. 25.

The cost of 2 cups of milk is 2× Rs. 25= Rs. 50

Again,

The cost of 1 plate of Chowmin is Rs. 60.

The cost of 2 plates of Chownin is 2× Rs. 60 = Rs. 120

Now, the total cost of 2 cups of milk and two plates of Chowmin = Rs. 50 + Rs. 120

= Rs. 170

(iii) The cost of 1 pieces of Samosa = Rs. 16

The cost of 3 pieces of Samosa= Rs. 16 × 3

= Rs. 48

300 Paisa = 3 Rupees

(iv) The cost of 6 pieces of Samosa = Rs. 16 × 6

= Rs. 96

The cost of 1 cup of tea = Rs. 20

The cost of 1 cup of milk . Rs.. 25

Total cost= Rs. 96 + Rs. 20 + Rs. 25 = Rs. 141.

Example 2

The cost of a pen is Rs. 25. Hira bought 5 pens. How much did she pay for 5 pens?

Solution

The cost of 1 pen = Rs. 25

The cost of 5 pens = Rs. 25 + Rs. 25 + Rs. 25 + Rs. 25 + Rs. 25

= 5× Rs 25

= Rs. 125

Example 3

The children of Bhrikuti Child Club decided to organize a football game. For this, If members collected Rs. 100 from each of them. They went to a shop and asked about the cost of a football. The cost of a football was Rs. 350. They decided to buy 3 footballs. Find whether they had enough money to buy 3 footballs.

Solution

The money collected by 11 members = 11 × Rs. 100
= Rs. 1100

The cost of 1 football = Rs. 350

The of 3 footballs = 3 × Rs. 350
= Rs. 1050

The money they have = Rs. 1100
= 1100 > 1050

Remining money = Rs. 1100 - Rs. 1050
= Rs. 50.

The money collected by them was enough for buying 3 footballs.

Exercise

1) Convert into Paisa.

i) Rs. 6 and 8 Paisa
ii) Rs. 7 and 25 Paisa
iii) Rs. 10 and 50 Paisa
iv) Rs. 15 and 30 Paisa

2) Multiply the following.

i) Rs. 4 and 25 P by 15
ii) 8 P by 25
iii) Rs. 4 and 75 P by 9
iv) Rs. 2 and 5P by 88

3) There were 10 notebooks brought for a prize distribution program of a school. A notebook costs Rs. 50. Find the total cost of the notebooks.

4) The cost of 1 Kg of apples is Rs. 280. Find the cost of 15 Kg of apples.

5) Bimal bought a toy car at the cost of Rs. 85 and 50 paisa and Nirmal bought beblet at the cost of Rs. 120. Find how much they spent in total.




(a) Rs. 75 Rs. 980 and 50 P Rs. 75 and 25 P (d) Rs. 230

6) The price list of a stationery shop is given below. Look at the price and answer the questions that follow:

(i) How much do 5 pens cost?

(ii) What is the total cost of a diary and 2 geometric boxes?

(ii) How much is returned if you gave Rs. 100 and bought a diary?

(iv) What will be the total cost of 3 calculators?

Project work

Collect five objects from your home. Ask about the costs with your parents and write the costs. Find the total cost of all those items.

8.3 Division related to money

Activity 1

It is assumed that there are 34 students in your class. You all decided to buy a wall clock for your classroom to know about time by collecting an equal amount of money. The cost of a wall clock was Rs. 680. How much money each of you should collect? Discuss.

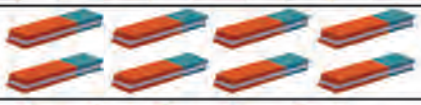
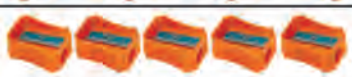
For discussion, the cost of a wallclock = Rs. 680, Number of students in class = 34. How much should one pay?

The amount to be paid by a person= Rs. 680 ÷ 34= Rs. 20

One student needs to pay Rs. 24.

Activity 2

Complete the following table:

Number of items	Total Cost	Cost of a item
1. 	Rs. 100	
2. 	Rs. 400	
3. 	Rs. 80	
4. 	Rs. 52	

To find the cost of one item, we need to divide the total cost by the number of items.

Example 1

The cost of four packets of biscuits is Rs. 324. What is the cost of one packet of biscuits?

Solution

The cost of 4 packets of biscuits is Rs. 324

The cost of 1 packet of biscuits = Rs. 324÷ 4

$$
\begin{array}{r}
81 \\
4 \overline{)\,324} \\
-32\downarrow \\
\hline
4 \\
-4 \\
\hline
0
\end{array}
$$

The cost of a packet of biscuits is Rs. 81.

Exercise

(1) Nikita spent Rs. 354 to her six friends for her birth-day celebration. How much did she spendon one friend? Find.

(2) 12 persons working in an industry get their salary of Rs. 12, 000 in a month. Find the salary of each person.

(3) If the cost of 3 pens is Rs. 185. Find the cost of a pen.

(4) If the cost of 5 kg. of rice is Rs. 854, find the cost of 1 kg. of rice.

(5) Find the cost of one item from the following table.

No of items	Total cost	Rate
1. 	Rs. 2250	
2. 	Rs. 3300	
3. 	Rs. 3850	

Project work

Look at the bill of recently bought items at your home. Note the total cost and cost of one item from the bill. Present in your class.

Lesson 9 Distance

9.1 Review

Write the appropriate unit, estimated length, and an exact measure of the length of the following objects or the distance between two places in the following table.

Description	Appropriate Unit	Estimation	Measure
(i) Your Maths Book			
(ii) Your eraser			
(iii) Whiteboard/Blackboard			
(iv) The distance of your home from the school			
(v) The distance for Kathmandu to Hetauda			

The units, millimeter (mm), centimeter (cm), meter (m), kilometer (km), etc. are used to measure distance.

9.2 Conversion of unit of distance to each other

A. Milimetre and centimetre)

Activity 1

Use a ruler to measure the length of your pencil

(i) Which unit is appropriate to measure the length of a pencil?

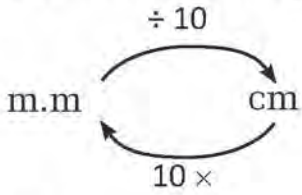
(ii) Why is a ruler used to measure the length of a pencil?

(iii) What is the length of your pencil?

There are ten thin lines between 10 cm and 11 cm. The distance between two thin lines is 1 millimeter. The length of the pencil is 10 centimeters and 4 millimeters. How many millimeters are there in 10 centimeters? What should be done to convert centimeter to meter? Discuss.

1 cm= 10 mm

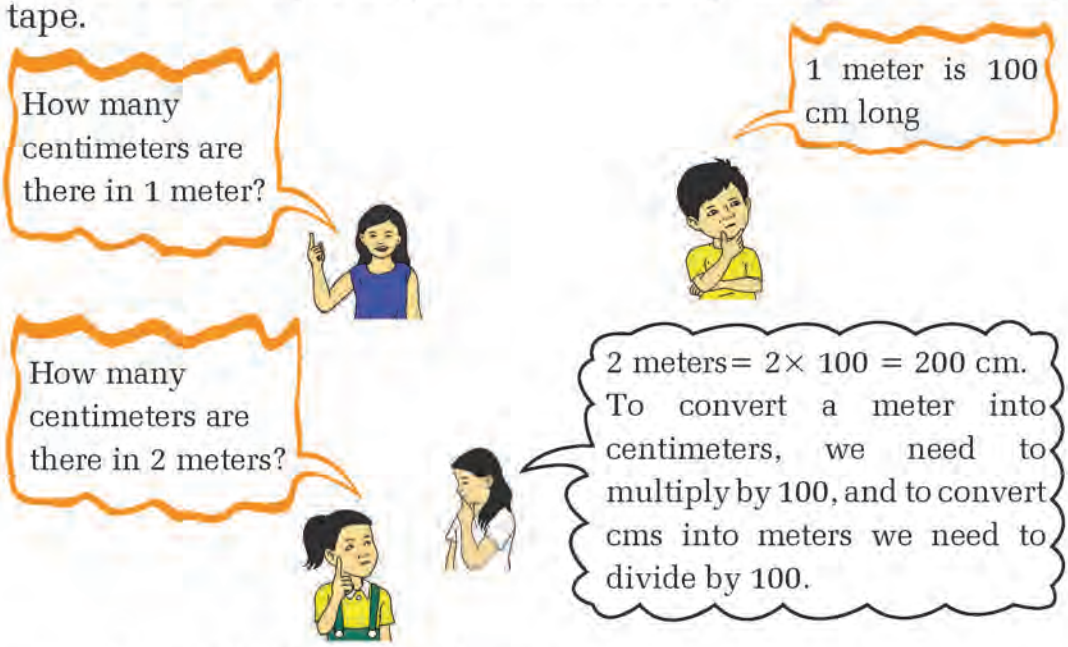
To convert cm into mm, we need to multiply by 10 and to convert mm into cm, we need to multiply by 10.



B. Centimetre and Metre

Activity 2

Measure the length of your classroom by using a measuring tape.



i. What is the length of the room?

ii. What should be done to convert the length of the room into centimeters?

C. Metre and Kilometre

Activity 3

What units are used in measuring length or distance in the following situation? What should be done to convert it into another unit? Discuss in your group.

(i) Length of the playground of a school
(ii) Distance between your classroom and library
(iii) Distance of bus station from your home
(iv) the length of Prithvi highway (Kathmandu- Pokhara)

The suitable unit of measurement for (i), (ii), and (iii) can be meter or kilometer as per the situation. The length of the Prithvi Highway is suitable in kilometers.

Discuss in your group: How can we convert meter (m) into kilometer (km) and kilometer into meters?

1 kilometer= 100 meter. We need to divide by 1000 to convert meters into kilometers. We need to multiply by 1000 to convert the kilometer into meters.

Example 1

The length of your pen is 12 centimeters. Find the length of the pen in millimeters.

1 centimeter = 10 milimeter

Solution:

Length of my pen = 12 cm

12 cm= 12×10 mm= 120 mm

Example 2

The length of nylon rope used for drying the clothes is 5 meters 20 centimeters. Find the total length in centimeters.

Solution

Length of rope= 5 m 20 cm

We know that,

1 m = 100 cm

Then, 5 m = 5× 100 = 500 cm

Now, 5 m 20 cm = 500 cm + 20 cm

= 520 cm

Example 3

The length of a room is 750 centermeter. Find the length of the room in meter and centimeter.

Solution

Length of a room = 750 cm

$= \frac{750}{100}$ m.

1 meter = 100 centimeter

= 100)750(7

− 700

50

7 meter 50 centimeter

Example 4

The distance of Langtang from Dhunche is 33 kilometer 600 meter. Find the total distance in meter.

Solution

Distance of Langtang from Dhunche = 33 km 600 m

= 33 × 1000 m + 600 m

= 33000 m + 600 m

= 33600 m

1 km = 1000 m

The distance of Langtang from Dhunche is 33600 m.

Example 5

The distance of Thankot Check-Post from Kalanki, Kathmandu is measured to be 8091 meters. Find the distance in kilometers and meters.

Solution

Length of the road from Kalanki to Thankot = 8091 m.

= 8000 m + 91 m

= 8 km 91 m

1000 m = 1 km

$8091 \text{ m} = \frac{8091}{1000} \text{ km}$

$$1000 \overline{)8091} \; 8 \text{ km}$$

$$-\,8000$$

$$91 \text{ m}$$

Thus, the length of road from Kalanki to Thankot Check-Post is 8 kilometer 91 meter.

Exercise

1. Fill in the blanks.

(i) 10 cm = ☐ milimeter

(ii) 1000m = 1 ☐

(iii) The 7-meter length road is = ☐ centimeter.

(iv) ☐ centimeter = 3meter.

(v) The kilometer length road is of = ☐ meter.

2. Convert as indicated in the brackets.

(i) 3 meter 20 centimeter (into centimeter)

(ii) 15 Km (into m)

(iii) 5 cm 3 mm (into mm

(iv) 2 km 200 m (into m)

(v) 250 cm (into m)

(vi) 12000 m (into Km)

(vii) 22 mm (into cm)

3. **The length of a table is 2 meters. Find the length in centimeters.**

4. **The straight distance of Kathmandu from Gorkha is 143 km 159 m. Find the distance in km.**

5. **The breadth of a house is 15 meters. Find the breadth in centimeters.**

6. **The breadth of a book is 14 cm. Find the breadth in mm.**

7. **Five ribbons each of 40 cm in length are joined to make a long ribbon. Find the length of the long ribbon in the meter.**

Project work

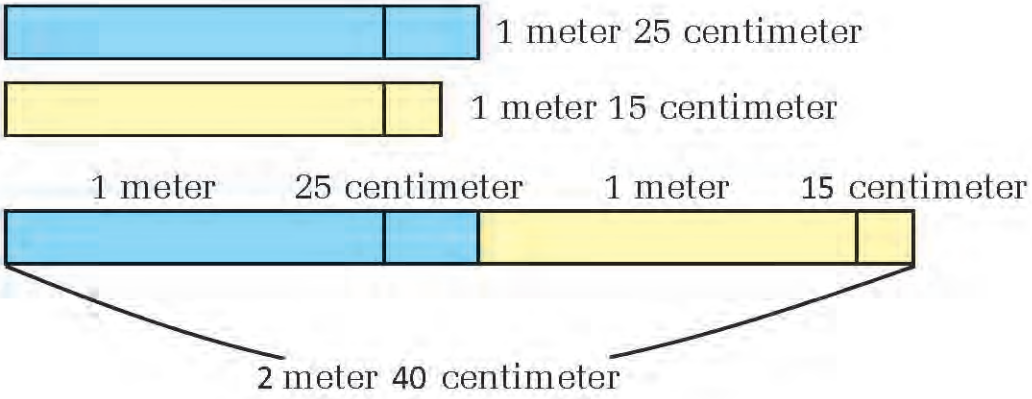
Measure the length and breadth of the furniture (bedroom, table, bed, etc.) available in your home. Express the measures in meters and centimeters and present them in your classroom.

9.3 Addition related to centimeter, meter and kilometer

Activity 1

Take two sticks of different lengths. Measure each stick differently. Join two sticks and measure the whole length. Find the relationship between the measurement obtained in two separate sticks and joined sticks.

For example,
Length of the first stick = 1 meter 25 centimeter
Length of the second stick = 1 meter 15 centimeter
Length of stick obtained by adding both sticks= 2 meters 40 centimeter



	meter	centimeter
	1	25
+	1	15
	2 meter	40 centimeter

Same units are added when we add the length.

The sum of the lengths of two sticks is the same as the length of a stick by adding two sticks.

Example 1

Suppose the distance between your classroom and the Principal's Office is 10 m 50 cm. The distance between the Principal's Office and the library is 9 m 85 cm. Find the distance between your classroom and library measured through the Principal's Office.

Solution

The distance from classroom to Principal's Office =10 m 50 cm

The distance from the Principal's Office to Library = 9 m 85 cm

	meter	centimeter
	10	50
+	9	85
	19 meter	135 centimeter
	1 meter	
	20 meter	35 centimeter

100 cm = 1m
135 cm = 1 m 35 cm

Example 2

A farmer's vegetable farming field is 1 km 200m far from his home. The vegetable market is 950 m far from the farming field. What is the distance travelled by the farmer from his home to the market?

Solution

Here,

The distance between vegetable farm and home = 1 km 200 m

The distance between vegetable farm and market = 950 m

	kilometer	meter
	1	200
+		950
	1	1150
	1	
	2 kilometer	150 meter

1. Add the following:

Exercise

(i)

m.	cm.
50	35
+ 15	51

(ii)

m.	cm.
17	22
+ 19	85

(iii)

km.	m.
250	500
+ 300	200

(iv)

km.	m.	cm.
15	150	12
+ 20	120	16

(v)

km.	m.	cm.
95	880	50
+ 15	200	40

2. **In a school, the length of the playground for senior students is 200 m 50 cm. The length of the playground for junior students is 100 m 85 cm. What is the total length of both playgrounds?**

3. **The length of the road from Godawari, Lalitpur to Koteswor, Kathmandu is 10 km 800 m. The length of the road from Koteswor, Kathmandu to Nagarkot, Bhaktapur is 21 km 300 m. Find the total length of the road from Godawari to Nagarkot along Koteswor.**

4. **The length of a road is 12 km, 750 m, and 50 cm, and the length of another road is 9 km, 300 m, and 15 cm. Find the total length of the two roads.**

Project work

Measure the length of your classroom and Principal's Office and add the lengths and present in your classroom.

9.4 Subtraction related to centimeter, meter and kilometer

Activity 1

Read the following dialogue and discuss.

Ask to measure the length of a rope.
Ask to cut some parts from the rope.
Ask to find the length of the remaining part of the rope.

5 meter 50 centimeter

A tree was 5 m 50 cm high. The upper 2 m 20 cm was broken by the wind. How high is it?

For that, we need to subtract the broken height from the total height.

How to subtract?

Arrange the values in the column of the same units and subtract.

meter	centimeter
5	50
-2	20
3 meter	30 centimeter

Example 1

The length of a conference hall is 10 m 50 cm. Its breadth is 8 m 75 cm. By how much the length is larger than the breadth?

Solution

Here, the length of the conference hall = 10 m 50 cm

The breadth of the conference hall= 8 m 75 cm

meter	centimeter
~~10~~ 9	100 + 50 = 150
- 8	75
1 meter	75 centimeter

Thus, the length of the hall is 1 m 75 cm larger than the breadth.

Exercise

1. Subtract the following:

(i)

m.	cm.
25	12
- 11	10

(ii)

m.	cm.
270	15
- 11	10

(iii)

m.	cm.
3	25
- 1	65

(iv)

m.	cm.
52	80
- 45	92

(v) 1 km. - 450 m.

(vi)

km.	m.
32	652
- 14	368

(iii)

cm.	m.
54	750
- 17	875

(iv)

km.	m.	cm.
15	460	55
- 8	750	35

2. **There was a wall having length of 25-meter 52 centimeters. But 10-meter 35 centimeter of the wall was broken due to heavy rain during the rainy season. How many centimeter is remained now?**

3. **Sabina had a ribbon of 4-meter 35 cm long. She gave some of the parts of the ribbon to Khusi by cutting it. She had 1 meter 85 centimeters left with her. Find the length of the ribbon given to Khusi.**

4. **A bus must travel 250 km. After traveling 95 km 750 m the bus reached to fuel station to fill the fuel. Find how much distance remains to travel.**

5. **The road distance between Furba's house and district headquarter is 28 km 350 m. Only 22 km and 550m of the road is cemented. Find the length of the road that is not cemented.**

Project work

Measure the length and breadth of your classroom. Find how much the length is larger than the breadth.

Lesson 10 Capacity

10.1 Review

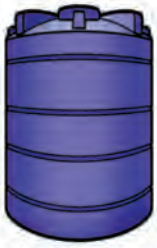
Discuss based on the following objects.


250 *ml.*


1 *ltr.*


2 *ltr.*


20 *ltr.*


1000 *ltr.*

In the figure, each object shows the capacity that contains liquid objects within. The units are given in liter and milliliter. Similarly, discuss the pots in which we put liquid.

The units of measuring capacity are milliliter (*ml*) and liter (*l*). The capacity is the amount of liquid that can be within the pot.

10.2 Conversion of liter and mililiter each other.

Example 1

Answer the following questions based on the following capacity.


200 *ml*


500 *ml*


1 *liter*


2 *liter*


20 *liter*

(i) How many times should the water of a 200 *ml* pot be put into the bottle of 1 liter to make it full?

(ii) How many times should the water of a 500 *ml* pot be put into the bottle of 1 liter to make it full?

(iii) How many milliliters are there in 20 liters? How many times should the water of a 500 *ml* pot be put into the jar to make it full?

Here,

(i) When poured five times by the water of 200 ml, the bottle of 1 liter is full.

For, 200 *ml* × 5 = 1000 *ml* = 1 *l*

(ii) When poured two times by the water of 500 ml, the bottle of 1 liter is full.

For, 500 *ml* × 2 = 1000 *ml* = 1 *l*

(iii) 20 *l* = 20× 1000 ml = 20000 *ml*

To make a full of 20 *l* jar by 500 ml pot, we need to pour 40 times because 40×500 *ml*= 20000ml.

Example 2

Take your water bottle. Guess the capacity of the bottle. What should we do it we need to convert the capacity in liter into milliliter and the capacity in milliliter into liter?

We multiply by 1000 to covert liter into milliliter and we divide by 1000 to convert milliliter into liter.

Example 1

The capacity of the water tank at your home is 500 liter. What is its capacity in terms of milliliter?

Solution

1 *l* = 1000 *ml*

500 *l* = 500× 1000 *ml* = 5,00,000 *ml*

Example 1

The capacity of a small bottle of milk is 250 *ml*. How many times should the milk be poured to make full the big pot of capacity 2 *l* ?

Solution

Capacity of small pot= 250 *ml*

Capacity of big pot= 2 *l* = 2× 1000 *ml* = 20000 *ml*

Let's count the number, we pour from small pot to big pot;

250 *ml*+ 250 *ml* + 250 *ml* + 250 *ml* + 250 *ml* + 250 *ml* + 250 *ml* + 250 *ml* = 2000 *ml*

8× 250 *ml* = 2000 *ml*

Thus, it should be poured 8 times.

Let's look by dividing

2000 ÷ 250

250)2000(8

−2000

0

∴ Thus the milk should be kept 8 times.

Example 3

How many liters and milliliters are there in 2500 milliliter? Write.

Solution

2500 *ml* = 2000 *ml* + 500 *ml*

= 2 l. 500 *ml*

1000 *ml*. = 1 *l*.

Let's look by dividing;

2500 ÷ 1000

1000)2500(2

- 2000

500

Thus,2500 *ml* = 2 *l* and 500 *ml*.

Exercise

1. Convert into milliliter (*ml*)

(i) 15 liter (*l*) = _____ *ml*

(ii) 9 *l* 90 *ml* = _____ *ml*

(iii) 6 *l* 400 *ml* = _____ *ml*

(iv) 22 *l* 200 *ml* = _____ *ml*

(v) 56 *l* 600 *ml* = _____ *ml*

(vi) 23 *l* 150 *ml* = _____ *ml*

2. Convert into liter and milliliter

(i) 7500 *ml* (ii) 6350 *ml*

(iii) 3571 *ml* (iv) 1575 *ml*

(v) 3300 *ml*

3. What is the measuring unit of the jar shown in the oil jar? Convert the capacity into milliliter.

4. What should be the capacity of a pot in liter to hold 5200 milliliters of milk into it?

5. The capacity of a watertank is 750 liter. What is the capacity in milliliter?

Project work

Collect 10 pots that can be used to keep liquid. Estimate the capacity of those pots. Note the capacity. Convert the capacity into liter if the capacity is given in milliliter and convert the capacity into milliliter if the capacity is given in liter.

10.3 Addition and subtraction of litre and mililitre

Activity 1

The following figure is about the daily used materials. Study the capacity given. Answer the following questions.


500 *ml*


1 *liter*


5 *liter*


20 *liter*

(i) How many glass of water will make cattle full?
(ii) How many kettle of water will make a jar full?
(iii) Find the total amount of water in all the pots: glass, jug, kettle, and jar.
(iv) If 1 kettle and a jug of water are removed from t he water in the jar, find how much water remains in the jar.

Example 1

A dairy company collects 20 *l* and 750 *ml* of milk from a farm and 30 *l* and 450 *ml* of milk from another farm. Find how much total milk is collected.

Solution

Here, Milk collected from firm farm = 20 *l* 750 *ml*
Milk collected from second farm= 30 *l* 450 *ml*

liters	milliliters
20	750
+ 30	450
50	1200
1	
51 liters	200 milliliters

1200 *ml.* = (1000 + 200) *ml.*
= 1 *l* . 200 *ml.*

Note: *ml* and *l* to be replaced in place of Nepali words.)

Therefore, 51 *l* and 200 *ml* of milk is collected in the company.

Example 2

There was 4 *l* and 250 *ml* of petrol in a motorbike. 1 *l* and 750 *ml* was consumed while travelling. Find how much petrol is remained in the motorbike.

Solution

liters	milliliters
4	250
- 1	750

we need to subtract to find the remaining petrol.

liters	milliliters
~~4~~ 3	1000 + 250 = 1250
- 1	750
2 liters	500 *ml.*

1 *l* = 1000 *ml.*

There was 2 *l* 500 *ml* of petrol in the motorbike.

Example 3

2 *liter* 1 *liter* 3 *liter* 250 *mililiter*

Find the total amount of juice based on the following figure.

Solution

Here,

l.	*ml.*
2	0
1	0
+ 3	250
6 *l.*	250 milliliters

Therefore, the total amount of juice in three pots is 6 *l* and 250 *ml.*

Exercise

1. Fill in the box by calculating from the figure.

(i) 60 *ml.* + 5 *ml.* = ☐

(ii) *ml.* - 100 *ml.* = ☐

(iii) 1000 *l.* + 5000 *l.* = ☐

(iv) 20 *l.* + 3 *l.* = ☐

(v) 5 *l.* + 1 *l.* = ☐

(vi) 4 *l.* + ☐ = ☐

2. Add the following

(i) 750 *ml* + 670 *ml* = _____

(ii) 2 *ml* 650 *ml* + 1 *l* 300 *ml* = _____

(iii) 690 *ml* +860 *ml* = _____

(iv) 3 *l* 600 *ml* + 2 *l* 800 *ml* = _____

3. Subtract

(i)

l.	*ml.*
6	400
- 2	500

(ii)

l.	*ml.*
49	380
- 44	290

(iii)

l.	*ml.*
12	770
- 5	355

(iv)

l.	*ml.*
22	250
- 11	450

4. A pot has 4 *l* and 660 *ml* of water in it. If you add 1 *l* and 550 *ml* of water to fill the pot. What is the capacity of the pot?

5. How many times should the 500 *ml* of bottle be poured to full the $1\frac{1}{2}$ *l* of a jar?

6. A patient bought 500 *ml* of medicine in liquid form. As per the doctor's prescription, the patient drinks 10 *ml* in the morning and 10 *ml* in the evening.

(i) How much amount of medicine is consumed in 3 days?

(ii) The patient stopped taking the medicine after 8 days. Find how much medicine is left.

7. Rama sold 1 *l* and 15 *ml* of tea from the thermos of 2 *l* and 770 *ml* of tea kept in a thermos. Find how much tea is in the thermos now.

Project work

Collects the pots available at your home to measure the capacity. Guess the capacity of the pots. Find the capacity of the pots by pouring water based on the known capacity of any pot.

Lesson 11 Weight

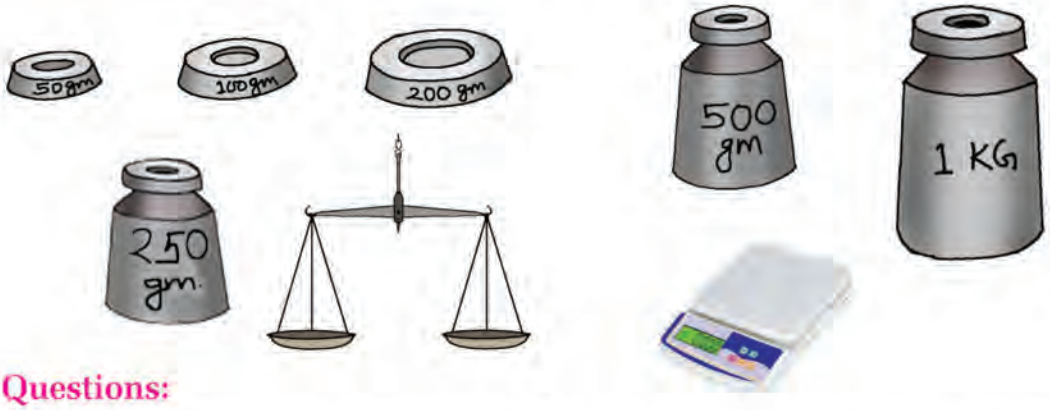
11.1 Review

We buy different goods from the market based on their weight. What types of materials are used to measure the weight?

11.2 Conversion of kilogram and gram each other

Activity 1

Discuss what type of machines are used to measure weight.



Questions:

(i) What types of weighing tools are used to measure weight in your market place?

(ii) What is the difference between beam balance and a digital weighing machine?

(iii) If 1 kg is placed on one side of the balance and how many 100 grams should be kept on another side to balance it?

(iv) How many 200 grams should be kept to balance for 1 kilogram?

(v) How many 500 grams should be kept to balance for 1 kilogram?

There are 5 weights of 200 grams (g) in 1 kilogram (kg). Similarly, there are two weights of 500g. There are 10 weights of 100 g in 1 kg.

Activity 2

Observe the following objects. Guess whether the kilogram or gram is an appropriate measure of the weight of the object. Discuss what should be done to convert gram into kilogram, and kilogram into gram. Present in your classroom the suitable measure of weighing the following objects.

We multiply by 1000 to convert kilogram to gram and divide by 1000 to convert gram into kilogram.

Example 1

Region bought 3 kg and 500 grams of apples from market. Find the weight of apples in grams.

Solution

$$\begin{aligned} 3 \text{ kg and } 500 \text{ g} &= (3 \times 1000) \text{ g} + 500 \text{ g} \\ &= 3000 \text{ g} + 500 \text{ g} \\ &= 3500 \text{ g} \end{aligned}$$

Example 2

A dozer took out 22000 grams of stone while constructing the road. Find the weight of the stone in kilograms.

Solution

Let's look by dividing

$22000 \div 1000$

$1000\,)22000(\,22$

$-\,2000$

2000

$-\,2000$

0

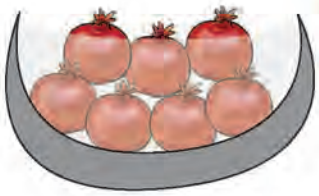
$1000\text{g} = 1\text{ kg}$

Thus, the weight of the stone is 22 kg.

Example 3

Find whether kg or g is suitable to measure the weight of the following objects.

(i)



(ii)

(iii)

(iv)

(V) If the weight of 7 pomegranates is 2 kg 500 grams. Find the weight in grams.

Solution

(i) Kilogram (ii) Gram (iii) Kilogram (iv) Gram

(V) The weight of 7 pomegranates $= 2\text{ kg } 500\text{ g}$

$= (1000 \times 2)\text{g} + 500\text{g}$

$= 2000\text{ g} + 500\text{g}$

$= 2500\text{g}$

11.3 Conversion of kilogram and quintal each other

Activity 1

Pasang : Oh! This truck is carrying heavy loads. How many kilograms would be there in the truck?

Salina : Yes. I think 10,000 kg. Let's ask our miss how many kilogram can a truck carry; (After they arrive at school)

Pasang : Miss, today, we have seen a truck carrying goods. How many kgs can a truck carry?

Miss : Did you guess? Yesterday, we read about kilogram and gram. Today, I will teach about your concern.

Salina : I think it was 10,000 g.

Miss : If there are more kilograms such as in the case of the truck, we can express it in quintals too. 100 kg makes a quintal. Salina, can you say how many quintals are there in 10,000 g?

Salina : Miss, 100 quintals.

Miss : How did you work out?

Salina : Miss, we learned that we need to divide by 1000 to convert gram into kilogram. (To divide to convert smaller units to bigger units). There is 100 kg in a quintal. Quintal is a bigger unit than kg. Thus I found it diving by 100.

Miss : Yes, you are correct.

Example 1

Shyama Chaudhary sold 15 quintal 75 kg of rice produced this year in his farm. Find the rice sold in kilogram.

Solution

15 quintals 75 kilograms $= (15 \times 100)$ kg + 75 kg

$= 1500$ kg + 75 kg

$= 15075$ kg

Example 2

A minitruck has carried 7500 kg of wheat. Find the wheat in quintals.

Solution

Let's divide

7500 ÷ 100

100)7500(75

- 700

500

- 500

0

∴ Thus, the minitruck has carried 75 quintals of wheat.

Exercise

1. Convert the following:

(i) 3 kg = _____ g

(ii) 3 kg 250 g= _____g

(iii) 1400 g= _____ kg _____g

(iv) 7 kg 500 g = _____ g

(v) 8 quintal 60 kg = _____ kg

(vi) 4560 kg = _____ quintal _____ kg

2. Convert the following into grams.

(i) 6 kg

(ii) 1 kg 300 g

(iii) 20 kg 500 g

(iv) 25 kg 700 g

(v) 7 kg 530 g

(vi) 8 kg 900 g

3. Express in kilogram and gram.

(i) 7500 g

(ii) 18300 g

(iii) 8770 g

(iv) 5100 g

(v) 2600 g

(vi) 5555 g

4. Convert into kilogram.

(i) 5 quintal

(ii) 7 quintal 50 kg

(iii) 15 quintal 65 kg

(iv) 11 quintal 7 kg

5. Express in quintal and kilogram.

(i) 415 kg

(ii) 609 kg

(iii) 725 kg

(iv) 1703 kg

6. The weight of Sipla's bag is 3 kg 250 g. Find the weight in gram.

7. **The weight of the dictionary available in the school's library is 2300 grams. Express the weight in kg.**

8. **A minitruck is carrying 7 quintals and 7 kg of food. Express the weight in kg.**

Project work

Collect any five items. Write the measuring unit; kilogram or gram used for measuring their weight.

Name of material					
Unit					

11.4 Addition and subtraction related to kilogram and gram

Activity 1

Take a digital weighing machine. Take weight by putting some objects in a bag. Keep on adding objects. Note the weight shown by the machine. Also, note the weight is in grams or kilograms.

Activity 2

Guess the weight of the following objects. Match the object with suitable weights.

(i) 

(ii) 

(iii) 

(iv) 

(v) 

(i) 

(ii) 

(iii) 

(iv) 

(v) 

Example 1

2 kg 260 gm

1 kg 500 gm

4 kg 800 gm

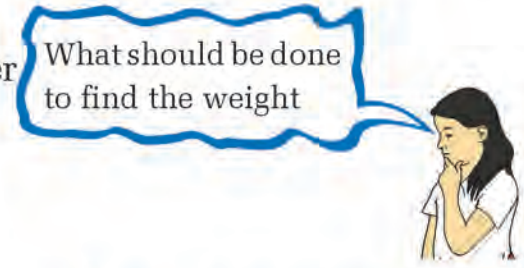
(i) What is the total weight of cucumber and bottle-gourd?

(ii) What is the total weight of bottle-gourd and carrot?

(iii) How much is the weight of a bottle-gourd greater than a carrot?

Solution

(i) Total weight of cucumber and bottle-gourd



kg.	g.
2	260
+ 4	800
6 kg.	1060 g.
1	
7 kg.	60 g.

Arrange kilogram and gram in columns. Add grams and add kilograms. As 1000 g= 1kg, gives us 1060 g= 1 kg 60 g.

The total weight is 7 kilograms and 60 grams.

(ii) The total weight of bottle-gourd and carrot

kg.	g.
4	800
+ 1	500
5 kg.	1300 g.
1	
6 kg.	300 g.

Thus, the total weight of bottle-gourd and carrot is 6kg 300 g.

(iii) The difference in the weight of bottle-gourd and carrot,

kg	g
4	800
− 1	500
3kg	300 g

By arranging weights in the columns of kg and g, subtract gram from gram and kg from kg.

The weight of a bottle-gourd is 3 kg 300g more than that of a carrot.

Activity 1

A pot contains 5 kg of sugar. If the pot has 3 kg 420 g of sugar, find how much sugar can be added to the pot.

Solution

kg.	g.
5	0
− 3	420

Solving by carrying out 1 kg to the gram,

kg.	g.
~~5~~ 4	1000
− 3	420
1 kg.	580 g.

Thus, 1kg 580g of sugar can be added to the pot.

11.5 Addition and subtraction related to quintal and kilogram

Activity 1

The adjoining figure is showing goods carried by a big and a small truck. Discuss the following questions based on the given figure.

(i) How many quintals and kilograms of goods are carried by the big truck and small truck respectively?

(ii) Find the total load carried by both trucks. Also, find in kg.

(iii) How much more goods wil lthe big truck have carried than the small truck?

Example 1

Hari Narayan grew 35 quintals 35 kg of maize in his 1 bigha of land and Dev Narayan grew 13 quintals 85 kg of maize in his one bigha of land.

(i) Find how much maize was grown by both.

(ii) Find the amount of maize to be grown up by Dev Narayan so that both would grow equal.

Solution

(i)

quintal	kg.
35	35
+ 13	85
48	120
1	
49	20

(ii)

kg.	g.
~~35~~ 34	35+100 = 135
- 13	85
21	50

Exercise

1. Add

(i)

kg.	g.
5	420
+ 4	100

(ii)

kg.	g.
7	600
+ 5	200

(iii)

kg.	g.
17	525
+ 13	663

(iv)

kg.	g.
51	152
+ 27	275

2. Subtract

(i)

kg.	g.
7	500
− 3	300

(ii)

kg.	g.
32	826
− 15	527

(iii)

kg.	g.
12	
− 10	616

(iv)

kg.	g.
88	524
− 69	811

3. Mother bought 3 kg 500 g of cereals and 2 kg 750 of wheat flour from the market. Find the total weight.

4. Sarala bought 1 kg of orange from the market. She found that 750 g of the orange was decayed. Find the weight of the good oranges.

5. A vegetable salesperson bought 24 kg of potato, 20 kg 300 g onion, and 15 kg 700 g beans from the wholesaler. Find the total weight of three items.

6. By increasing 7kg, 300g of weight, Nima is now 50kg 500g. Find her previous weight.

7. Raju's previous weight was 47 kg 300 g and now he is 50 kg 500 g. Find the increased weight.

8. A truck is carrying 13 quintals, 75 kg of food and another truck is carrying 7 quintals, 50 kg of food. Find the total food carried by both trucks.

Project work

Visit the nearest grocery shop and note the weight of any five goods. Make sure that they are in kg and g. Add their weights and present them to your class.

Lesson 12 Perimeter and Area

12.1 Perimeter

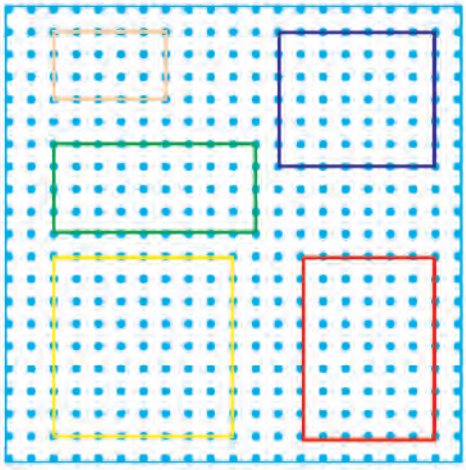
Activity 1

By observing the Geoboard on the right, discuss the following questions.

(i) Find the length of the sides of the red, blue, and yellow rectangles made by rubber bands. Which one of these is the longest?

(ii) Find the length of the sides of the green and violate rectangles. Which one is the shortest?

(iii) If the shortest distance between nails (i.e., the horizontal or vertical) is 3 cm, find the total length of rectangles and squares.



Geoboard is an aid made on a board of plywood by fixing nails and shapes are made with the help of rubber bands.

Activity 2

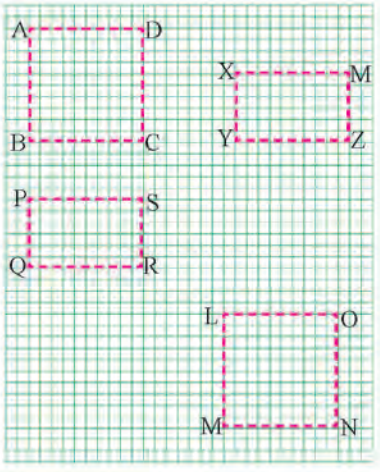
Find the answers to the following questions by observing the Graph-board on the right:

(i) What is the total length of the sides of the rectangles: ABCD, XYZM, and PQRS?

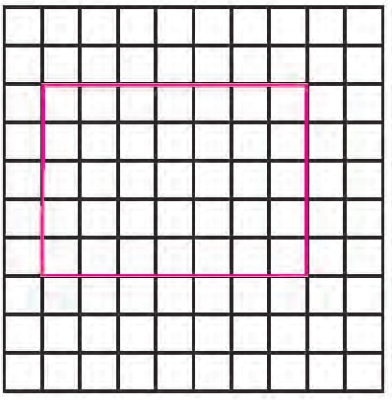
(ii) What is the length of the sides of the rectangle LMNO?

(iii) The graph is on a centimeter scale, find the length of all sides in each of the above figures.

(iv) Which figure has the longest side?



Activity 3



Form a group by making an appropriate number. Take a centimeter graph board by each group. Draw different rectangles on the graph board. Then, count the number of squares inside the rectangle(s) and present them in your class.

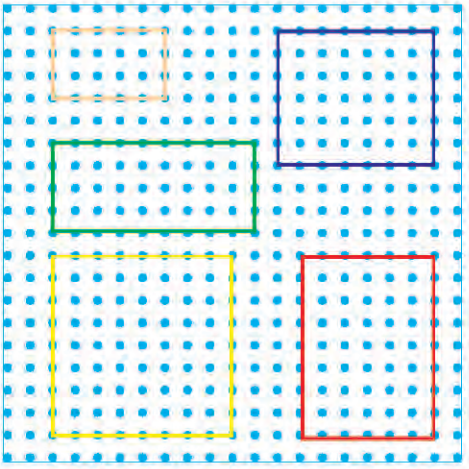
In the given figure, the rectangle contains 1cm × 1 cm of square rooms within it. Count the numbers of the rooms along all sides of the rectangle. There are 7 rooms on the length and 5 rooms on the breath.

Thus, perimeter of the rectangle = 7+7+5+5= 24 cm

Perimeter is the measure of the outer length of a shape.

12.2 Area

Activity 4



i. How many square rooms are there within the red and blue rectangles made with rubber bands?

ii. How many square rooms are there within the yellow and green rectangles made with rubber bands?

iii. If the area of 1 square room is 1 square unit, what is the area of all rectangles?

iv. In the previous activity of perimeter (Activity 2), find how many square rooms are there within rectangles ABCD, XYZM, PQRS, and LMNO.

(v) If the area of a square room is 1 square cm, then find the area of all the rectangles.

The area of the rectangle is the number of unit squares within the rectangle. The unit square is the square having a length of 1 unit.

Example 1

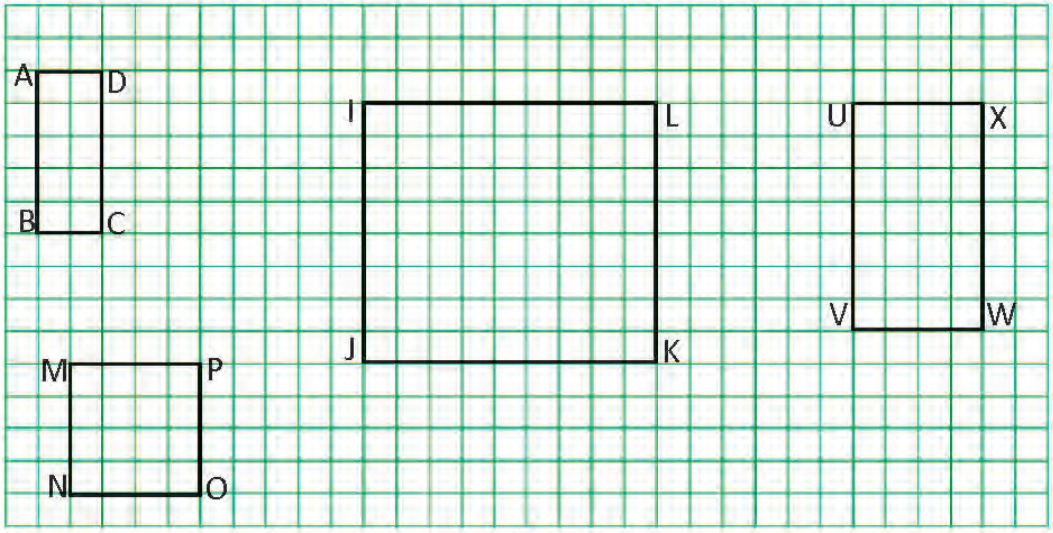
Study the following graph and answer the following questions:

(i) Find the area of rectangle ABCD by counting the unit squares.

(ii) How many unit squares are there in rectangle MNOP?

(iii) Find the perimeter of the IJKL by counting the rooms.

(iv) How many rooms are there in the length of UVWX and the breadth of UVWX?



Solution

(i) The unit squares on the length = 5

The unit squares on the breadth = 2

Area of rectangle ABCD= $5 \times 2 = 10$ square units.

Alternatively,

No of the unit squares within the rectangle = 10

Area of ABCD = 10 square units.

(ii) There are 16 square units in MNOP.

(iii) The number of unit squares along the length and breadth $= 9+8+9+8 = 34$

Therefore, perimeter = 34 units.

(iv) In UVWX, no of box along lenght = 7

no of box along breadth = 4

Example 2

Find the area and perimeter of the given shape by counting the unit squares along the length and breadth.

Solution

No of unit squares along length = 14

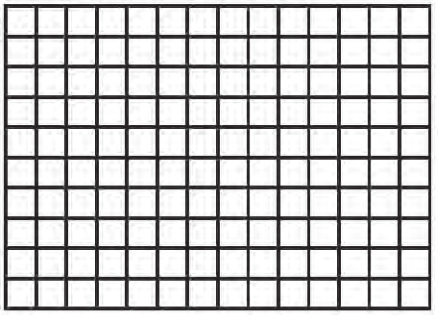
No of unit squares along breadth = 10

No of unit squares= 14×10 =140

Therefore area= 140 square units.

No of squares on the surrounding = 14+ 14+10+10= 48 units.

Therefore, perimeter = 48 units.

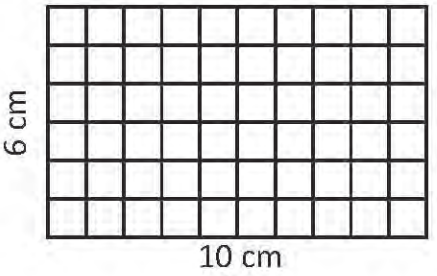


Example 3

Draw a rectangle having a length of 10 cm and a breadth of 6 cm. Find the area and perimeter of the rectangle by drawing square units.

Solution

Let's draw squares having 1 cm length and 1 cm breadth within the rectangle. There are 10 rooms on the length and 6 rooms on the breadth.



Total rooms = 10×6=60

Thus, the area = 60 square cm.

Similarly, number of rooms on the length= 10 + 10 = 20

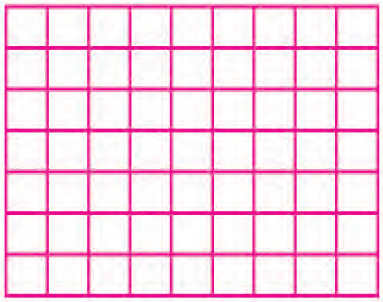
Number of the rooms on the breadth = 6+6 = 12

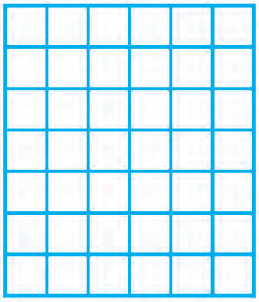
Total rooms = 10+10+6+6= 32.

Thus, perimeter= 32 cm.

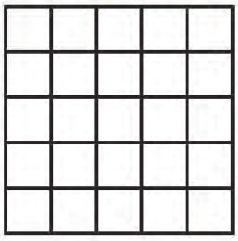
Exercise

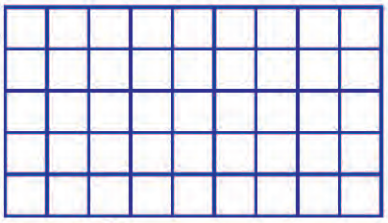
1. Find the area of rectangles by counting square rooms.

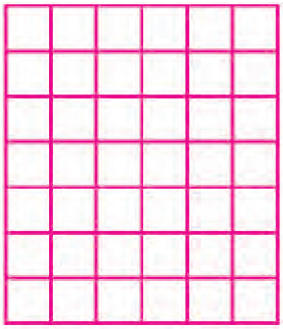
(i) 

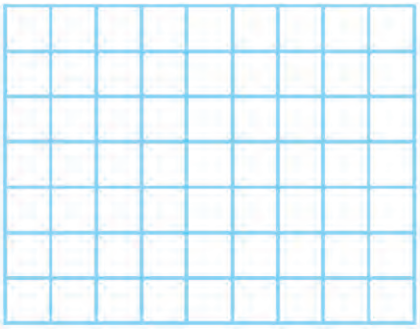
(ii) 

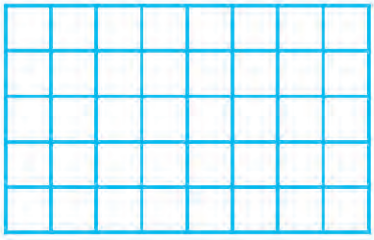
2. Find the perimeter and area of the following rectangular figures. (are of each box is 1 square cm.)

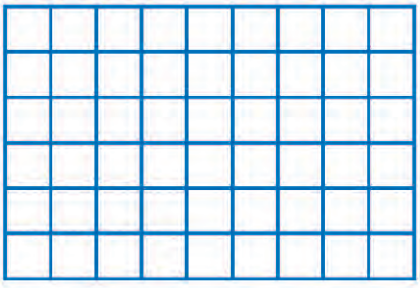
(iii) 

(iv) 

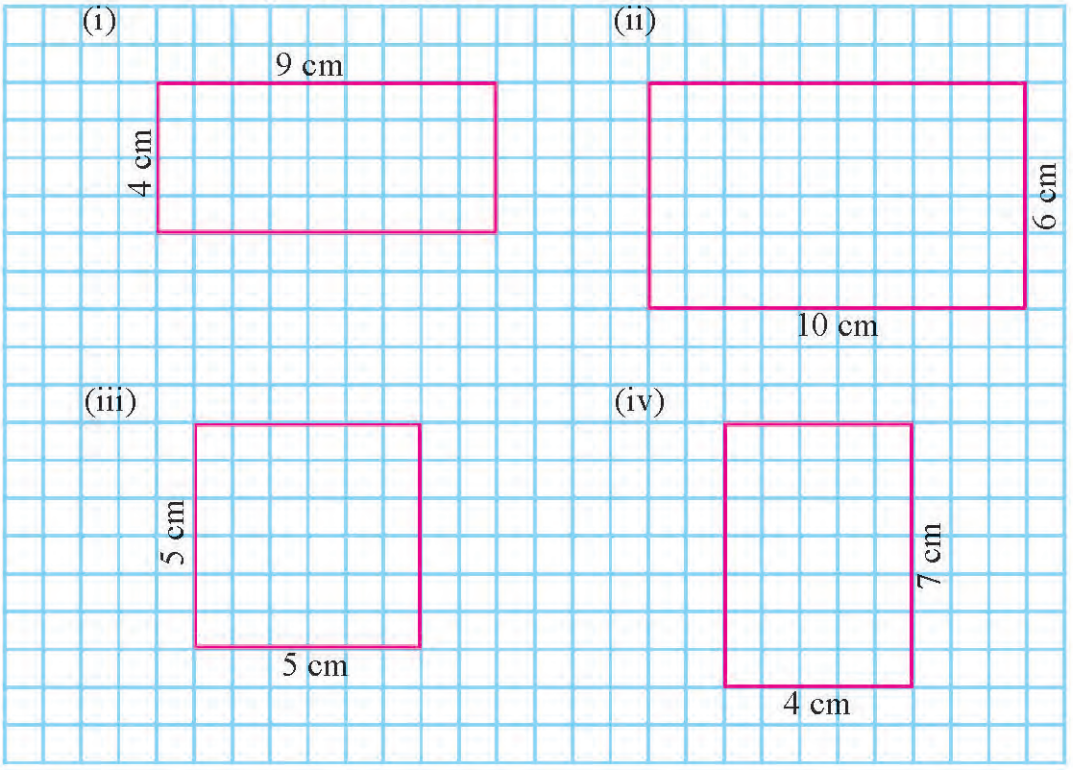
(i) 

(ii) 

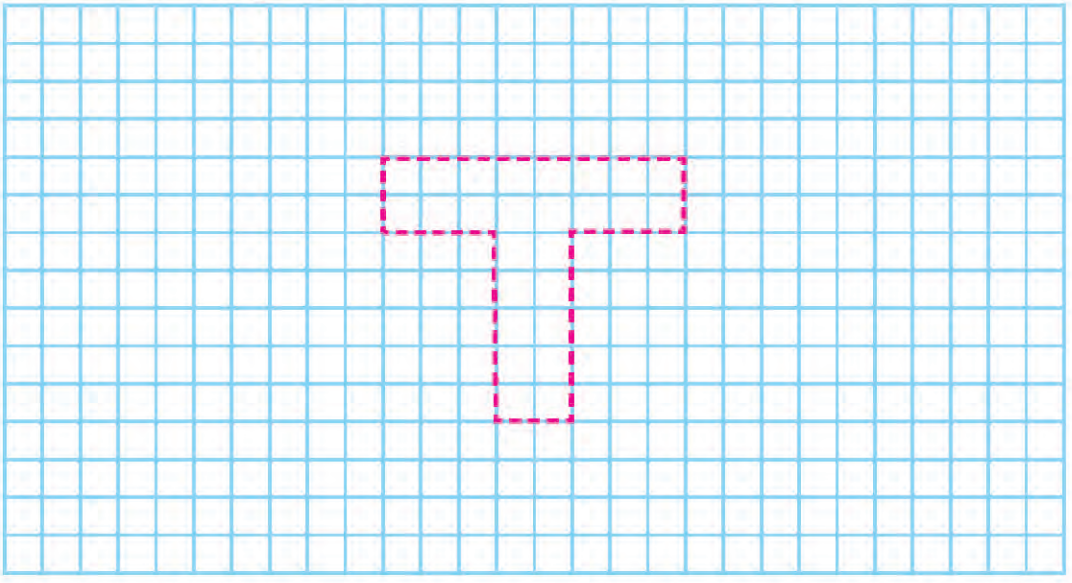
(iii) 

(iv) 

3. Draw the rectangle of the given measures. Find perimeter and area by counting the unit squares.



4. Find the perimeter and area of the given figure by counting the unit squares.



Project work

(i) Trace the upper surface of your Math Book on a chart paper. Draw unit squares in the tracing. Find the area and perimeter by counting the unit squares. Present in your class.

(ii) Draw the first letter of your name on a graph paper as done in question number 4. Find area and perimeter. Present in your class.

Mixed Exercise

1. circle (O) the correct answer.

(i) How many months are there in 3 years?

(a) 12 (b) 24 (c) 36 (d) 48

(ii) How many years are there in 730 days?

(a) 1 (b) 2 (c) 3 (d) 4

(iii) How many hours are there in 3 days?

(a) 24 (b) 36 (c) 48 (d) 72

(iv) How many seconds are there in 5 minutes and 12 seconds?

(a) 312 Seconds (b) 512 Seconds

(c) 300 Seconds (d) 600 Seconds

(v) The cost of 1 pen is Rs. 10. What is the cost of 10 pens?

(a) Rs. 8 (b) Rs. 10 (c) Rs. 18 (d) Rs. 80

(vi) How many centimeters are there in a meter?

(a) 10 (b) 100 (c) 1000 (d) 10000

(vii) Which measuring unit is appropriate to measure the length of your book?

(a) milimeter (b) centi-meter
(c) meter (d) kilometer

(viii) How many milliliters are there in a liter?

(a) 10 (b) 100 (c) 1000 (d) 10000

(ix) What will be when we add 200 l 50 ml and 180l980 ml?

(a) 380 l 30 ml (b) 380 l 1030 ml
(c) 381 l 30 ml (d) 381 l 300 ml

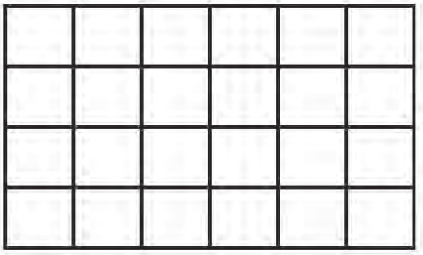
(x) How many kilograms are there in 2 quintals?

(a) 20 (b) 200 (c) 2000 (d) 20000

(xi) How many grams are there in 5 kilograms?

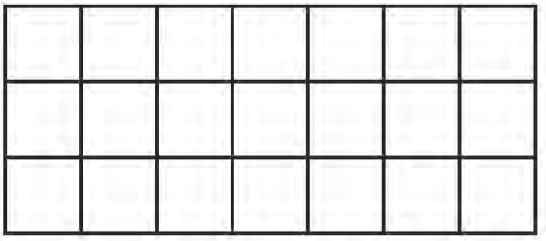
(a) 50 (b) 500 (c) 5000 (d) 50000

(xii) What is the perimeter of the given figure?



(a) 15 (b) 20 (c) 24 (d) 28

(xiii) What is the area of the given figure?



(a) 3 (b) 7 (c) 20 (d) 21

2. Fill in the blanks.

(i) 1 years = _____ days.

(ii) 2 hours = _____ minutes.

(iii) Rs. 5 = _____ Paisa.

(iv) 3 m = _____ m

(v) 2000 m = _____ km

(vi) 50 *l* = _____ *ml*

(vii) 3 kg = _____ g

3. Convert the following as indicated

(i) 5 years 3 months into months

(ii) 4 hours 45 minutes into minutes

(iii) 140 hours into days and hours

(iv) 25100 meter into kilo-meter

(v) 9 l 280 ml into ml

(vi) 55 kilogram into gram

4. The three books in the bag weigh 4 kg. If two of them weigh 1 kg 200 g. What is the weight of the third book?

5. If the cost of a waterbottle is Rs. 15 and 75 paisa, what will be the cost of such 9 bottles?

6. The sum of the ages of Sebika and Sohit is 20 years and 10 months. Sebika is now 8 years 11 months. What is the age of Sohit?

7. If the height of Mt. Everest is 8848 m and 86 cm, express the height into cm.

8. Prafulla sold 15 quintals, 65 kg of rice produced last year, and sold 11 quintals, 75 kg of rice produced this year.

(i) Find how much kg of rice was sold last year and this year.

(ii) How much is low this year as compared to last year?

(iii) What are the reasons for selling less rice this year?

9. If the weight of a packet of gram-nut is 2 kg 600 g, what will be the weight of such 5 packets?

10. If 20 *l* 840 *ml* is added to 11 *l* 727 *ml*, what will be the total? Find.

11. Shiva went to market with Rs. 100. He bought a pen for Rs 25 and 50 Paisa, a notebook for Rs. 30 and 25 Paisa, and 2 pencils for Rs. 10 and 50 Paisa. Find how many Rs. and Paisa is remaining with him now.

12. If the cost of 12 bottles of juice is Rs. 1806, find the cost of 1 bottle of such juice.

13. Vintuna visited her sick friend Prasila with 2 kg of pomegranates and 1-liter juice.

(i) The cost of pomegranate is Rs. 300 per kg and the cost of juice is Rs. 180. How much did Vintuna spend in total?

(ii) If she had Rs. 1000, how much was the remaining amount with her?

(iii) If 250 grams of pomegranate is given per day, for how many days will Prasila eat the fruit?

(iv) If the same amount of pomegranate is to give to Prasila for two weeks, find how much more is required now.

(v) 125 *ml* of juice is given at a time. Find out how many times will the juice be given to eat.

14. A truck carried 140 quintals of sugar from Lumbini Sugar Mill to Kathmandu.

(i) Find the sugar in Kg.

(ii) If each sack has 50 kg of sugar, find how many sacks were there.

(iii) If Rs. 300 per sack was the fare of transportation, find the total fare.

15. To construct a building in Rasuwa, 500 sacks of cement were transported from Hetauda Cement Industry.

(i) Each sack was 50 kg. Find the total cement in quintals.

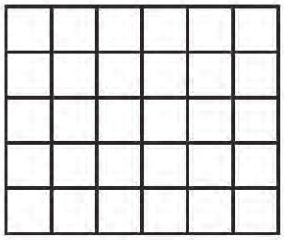
(ii) The fare is Rs. 500 per quintal. What is the total fare for transportation?

(iii) If Rs. 825 is paid per sack, how much should be paid to the industry?

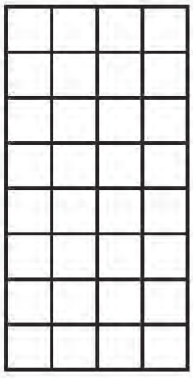
(iv) Find the total cost.

16. Observe the following figure. Answer the following questions.

(a)



(b)



(i) Find the area of the figure (a) and the area of figure (b).

(ii) Find the perimeter of the figure (a) and the perimeter of figure (b).

(iii) Why is the area different though the perimeter is the same?

(iv) Make a rectangle from the area of the figure

(a) that has a different perimeter.

(v) Find the difference in the perimeter of the rectangle made in (iv).

Lesson 13

Bill and Budget

13.1 Bill

You might have gone to market with your parents, brother, or sister. While buying goods in the market, you might have noticed the paper as given below. The shopkeeper gives the paper before paying the cost of all goods bought. You might have seen whether all the goods are there in the bag as per the amount mentioned in the paper. You might have noticed looking over the rate and total amount in the paper. Finally, you might have noticed paying the total amount of money from a purse or bag. The buyer keeps the paper for reference.

Pan No. 10369022 Bill No. 00023

Jal Agrovet Shop
Dhusa, Hiti

Buyer: Rishi Sapkota Date: 2078/06/01

SN	Description	Quantity	Rate	Amount (Rs.)
1.	Cabbage	5 kg	50	250
2.	Tomato	2 kg	40	80
3.	Cucumber	6 kg	35	210
4.	Pumpkin	3 kg	40	120
5.	Radish	4 kg	45	180
Total				840

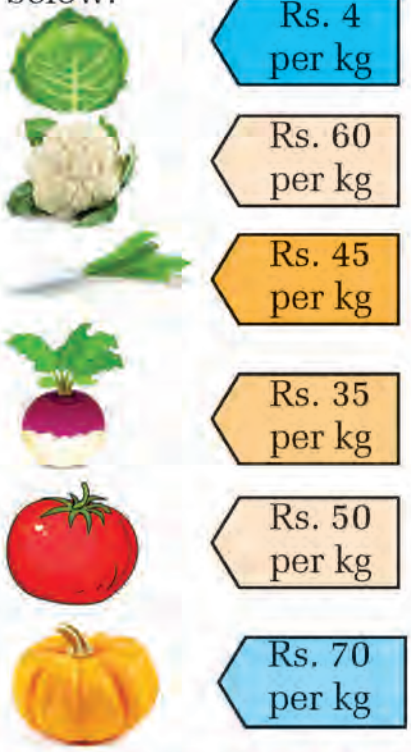
In Words: Eight hundred and forty only.

Susan

Seller

The paper given by the shopkeeper while buying goods is called a bill. Bill must be taken after buying goods.

The prince list in Gongabou Vegetable Shop is shown as given below.



Activity 1

Let's discuss

(i) Which vegetable is the cheapest one?
(ii) Which vegetable is the most expensive one?
(iii) What vegetables can be bought for Rs. 35?
(iv) Can a person with Rs. 100 buy three vegetables?
(v) Name three vegetables that can be bought with Rs. 50.
(vi) Tomato is compulsory to buy. What are two vegetables that can't be bought with Rs. 100?

Let's Understand the Bill:

The Bill shown below is the bill when Ramesh Deuja bought vegetables from Gongabou Vegetable Shop.

Pan No. 103690333 Bill No. 01123

Gongabou Vegetable Shop

Gongabou, Kathmandu

Buyer: Ramesh Deija Date: 2077/05/07

SN	Description	Quantity	Rate	Amount Rs.
1.	Cabbage	2 kg	60	120
2.	Tomato	1 kg	50	50
3.	Pumpkin	1 kg	70	70
	Total			240

In Words: Two hundred forty only.

Rahim
Seller

Answer the following questions.

(i) Where did Ramesh Deuja buy vegetables?

(ii) Where is the shop located?

(iii) What were the vegetables bought by Ramesh Deuja?

(iv) How much is the total bill?

(v) If Ramesh Deuja gave Rs. 300, how many rupees did he get in return?

Based on the discussion of the above questions:

Bill is the paper someone gets when she or he buys goods. In a bill, the name of the shop, address, date, goods bought, rate and buyer's name, etc. are mentioned.

Activity 2

Let's understand the bill:

Ujina made a list of goods to be bought on her birthday.

Good to Buy
Cabbage: 6 kg Potato: 5kg Tomato: 2 kg Sugar: 2kg flour: 3 kg Pea: 2kg Chocolate: 3 packet OilM 3l

Good to Buy
Cabbage: 6 kg Potato: 5kg Tomato: 2 kg Sugar: 2kg flour: 3 kg Pea: 2kg Chocolate: 3 packet Oil: 3l

Price List		
Cabbage: Rs. 50/kg	Potato: Rs. 43/kg	Rice: Rs. 80/kg
Sugar: Rs. 80/kg	Tomato: Rs. 30/kg	Flour: Rs. 50/kg
Pea: Rs. 110/kg	Oil: Rs. 155/l	Salt: Rs. 22/kg
Chocolate: Rs. 150/flour		

This price list was in the nearby 'Jastapur Shop'. Discuss in your group based on the price list.

(i) How much does Ujina need to pay for 6 kg of cabbage?

(ii) Similarly, how much is it to pay for 5 kg of potato?

(iii) How much to pay for 3 kg of tomato and 2 kg of sugar?

(iv) After buying all goods as in the list, how much does she need to pay in total?

Activity 3

The shopkeeper gave her the following bill after buying goods.

Pan No. 103690364 Bill.No 00023

Jestapur Grocery Shop

Jestapur, Lalitpur

Buyer's Name: Ujina Date: 2078/06/01

SN	Description	Quantity	Rate Rs.	Amount Rs.
1	Cabbage	6 kg	50	300
2	Potato	5 kg	43	215
3	Tomato	3 kg	30	90
4	Pea	2 kg	110	220
5	Sugar	2 kg	80	160
6	Wheat flour	2 kg	50	100
7	Chocolate	3 packet	150	450
8	Oil	3 *l*	155	465
Total amount				-2000-

In words: Two thousand only.

Sold by
Phurba

Be in a group and check whether the goods are bought as per the list or not. Check the amount and total amount of the bill.

If Ujina adds 2 kg of tomato, how much money does she need to add?

If Ujina bought 5 kg of tomato at first, where does it differ?

Activity 4

Be in a group. Discuss the following questions based on the bill given above.

1) What are the things mentioned in the bill?
2) What should be written on the date?
3) Where are the names of the seller and buyers written?
4) How is the cost of goods calculated?
5) How is the total bill amount calculated?

Sample Answers:

1) In a bill, the name of the shop, address, buyer's name, date, description of goods, quantity, rate, amount, total bill amount, name, and signature of the seller are mentioned.
2) Ujina bought the goods on 2078/06/01. Date on the bill indicate the date the good are bought.
3) Buyer's name is written before the detail of the goods and the seller's name is written at the end of the bill.
4) The cost of goods is calculated by multiplying the quantity and rate. For example, the cost of 1 kg of pea is Rs. 100 and the cost of 2 kg of pea is calculated by $2 \times 110 =$ Rs. 220. Similarly, the cost of 3 liters of oil is $3 \times 155 =$ Rs. 365.
5) Ujina paid Rs. 2000 in total. This is calculated by adding the amount of all goods.

Terms Used in a Bill

Buyer: A person or customer who buys goods

Seller: Shopkeeper or a person who sells goods

Date: The date of when the goods was bought

Description: Name(s) of the goods bought

Quantity: The weight or number ofunits bought

Rate: The cost of one unit. (Cost of 1 kg, the cost of 1 liter, the cost of 1 packet, etc.)

Amount: The cost of the quantity bought a type of goods

Total: The cost of all goods bought

In Words: Total amount written in the words

Example 1

Read the bill given below and answer the questions.

Pan No. 1626204 Bill No. 048

Lumbini General Store

Nawalparasi

Buyer: Rashika Ghimire Date: 2077/05/10

SN	Description	Quantity	Rate Rs.	Amount Rs.
1.	Rice	10 kg	75	750
2.	Gram	2 kg	75	150
3.	Green pea	1 kg	80	80
	Total			980

In Words: Nine hundred and eighty only. Pasang

Seller

Questions:

(i) What is the name of the shop?

(ii) Who bought the goods?

(iii) What are the goods bought?

(iv) What is the cost of 1 kg of rice?

(v) How much rice is bought?

(vi) What is the total bill?

(vii) If Rashika has given Rs. 1000 to the shopkeeper, how much is the return? Find.

Example 2

Yam Nath Koirala bought the following goods from Jayamata Stationery, Kushma, Parbat.

1. 1 Mathematics dictionary at the rate of Rs. 490
2. 2 Geometry boxes at the rate of Rs. 290
3. 7 Notebooks at the rate of Rs. 90
4. 1 pen at the rate of Rs. 80. Fill in the bill to make for Yam Nath Koirala.

Pan No. 1626223 Bill No. 095

Jayamata Stationery
Kushma, Parbat

Buyer: ---------- Date: ----------

SN	Description	Quantity	Rate Rs.	Amount Rs.
1.				
2.				
3.				
4.				
Total				

In Words: Nine hundred and eighty only .....

Seller

Calculation of amount

Mathematics dictionary: 1× Rs. 490= Rs. 490
Geometry box: 2×Rs. 290= Rs. 580
Notebook: 7× Rs. 90 =Rs. 630
Pen: 1× Rs. 80= Rs. 80

We can fill up the calculations in the bill.

Pan No.1626223 Bill No. 095

Jayamata Stationery
Kushma, Parbat

Buyer: Yam Nath Koirala Date: 2078/03/20

SN	Description	Quantity	Rate Rs.	Amount Rs.
1.	Mathematics Dictionary	1	490	490
2.	Geometry Box	2	290	580
3.	Notebook	6	9	630
4.	Pen	1	80	80
Total				1780

In Words: One thousand seven hundred and eighty only.

Tejendra
Seller

Example 3

Study the pricelist, goods bought, and bill. Answer the following questions.

Price List

Apple: Rs. 230/kg	Pomegranate: Rs. 290/kg
Orange: Rs. 80/kg	Grape: Rs. 200/kg
Papaya: Rs. 90/kg	Mango: Rs. 130/kg
Banana: Rs. 80/dozen	Pineapple: Rs. 110/kg

List of Bought Fruits

Apple: 6 kg	Orange: 5 kg
Papaya: 2 kg	Grape: 2 kg
Pineapple: 3 kg	Banana:3 dozen

Pan No. 2393263 Bill No. 00013

Sarlahi Fruit Shop
Sarlahi

Buyer: Aman Tullah Anshari Date: 2078/06/05

SN	Description	Quantity	Rate Rs.	Amount Rs.
1.	Apple	7 kg	230	1610
2.	Papaya	2 kg	90	180
3.	Orange	5 kg	80	400
4.	Grape	2 kg	200	400
5.	Pineapple	1 kg	110	110
6.	Banana	3 dozen	80	240
Total				2940
In Words: Two thousand nine hundred and forty.				

Puja Shahi
Seller

Questions:

1. Which fruits are written more in the bill than are bought?
2. Which fruits are written less in the bill than that are bought?
3. Can you find other mistakes in the bill?

By correcting the above bill, the shopkeeper has given the following bill. Answer the following questions based on the given bill.

Pan No. 2393263 Bill No. 00014

Sarlahi Fruit Shop
Sarlahi

Buyer: Aman Tullah Anshari Date: 2078/06/05

SN	Description	Quantity	Rate Rs.	Amount Rs.
1.	Apple	6 kg	230	1380
2.	Papaya	2 kg	90	180
3.	Orange	5 kg	80	400
4.	Grape	2 kg	200	400
5.	Pineapple	3 kg	110	330
6.	Banana	3 dozen	80	240
Total				2930
In Words: Two thousand nine hundred and thirty.				

Puja Shahi
Seller

Questions:

4. How much does Aman Tullah Ansari need to pay as per the new bill?
5. If Aman Tulah Ansari paid according to bill No. 00013, how much does he need to add or get a return?

Solution

1. The quantity of apples is more
2. The quantity is pineapple is less
3. Others are correct.
4. Total Rs. 2930
5. He gets a return of Rs. 10

Exercise

1. Study the following bills carefully and answer the questions.

A. The Bill of Mechi General Store

Pan No. 2593263 Bill No. 003

Mechi General Store
Jhapa

Buyer: Premika Upreti Date: 077/03/15

SN	Description	Quantity	Rate Rs.	Amount Rs.
1.	Mansuli rice	10 kg	65	650
2.	Marsi rice	5 kg	120	600
3.	Split red lentil	2 kg	100	200
4.	Split black Gram	1 kg	120	120
Total				1570

In Words: One thousand five hundred and seventy.

Seller

Questions:

1. What is the name of the shop?
2. What is the name of the buyer?
3. On what date did she buy it?
4. Which rice is expensive? By how much?
5. What is the total?
6. If Premika gave Rs. 2000, how much return did she get?

(B) The Bill of Doti Book Shop

Pan No. 2593257 Bill No. 011

Doti Book Shop
Doti

Buyer: Rupesh Bhatta Date: 078/03/15

SN	Description	Quantity	Rate Rs.	Amount Rs.
1.	English	2	300	600
2.	Math	1	270	270
3.	Nepali	3	280	840
Total				1710

In Words: One thousand seven hundred and ten

Seller

Questions:

1. What is the name of the shop?
2. What is the name of the buyer?
3. When did Rupesh buy it?
4. Out of Math and English books, which one is expensive? By how much?
5. How much is the total bill?
6. If Rupesh Batta gave Rs. 2000, how much did he get in return?

(C) Study the bill given by Narayani Medicine Shop.

Pan No. 2343257 Bill No. 024

Narayani Medical Shop
Bharatpur, Chitwan

Buyer: RupikaTharu Date: 2078/02/15

SN	Description	Quantity	Rate Rs.	Amount Rs.
1.	Paracetamol	3	20	60
2.	Amoxycillin	5	85	425
3.	B-complex	1	12	30
Total				515

In Words: Five hundred and fifteen.

Seller

Questions:

1. What is the name of the shop?
2. What is the name of the buyer?
3. How much is the total bill?
4. If Rupika gave Rs. 500 to the shopkeeper, how much does she needs to add?
5. Where is the mistake in the bill?
6. Write a new bill by correcting the mistake.
7. How much should the shopkeeper need to return after the correction of the mistake?

D. Write the answers to the following questions based on the price-list of the fruits.

The price-list of Anvesh Fruit Shop

Rs. 240 per kg

What is the cost of pomegranate per kg?
What is the cost of 5 kg of pomegranates?

Rs. 340 per kg

What is the cost of apple per kg?
How much more is the cost of apple than of pomegranate?

Rs. 180 per kg

What is the cost of orange per kg?
How much does 5 kg of orange cost?
What is the cost of a dozen of bananas?
How many dozens of bananas can be bought in Rs. 600?
What is the cost of 1 kg of mangos? What amount of mangos can be bought in Rs. 700?

Rs. 120 per kg

Rs. 150 per kg

2. Study the bills

given below. Answer the questions.

Pan No. 2348477 Bill No. 032

Khatiwada Grocery Shop

Bharatpur, Chitwan

Buyer: Amit Jayaswal Date: 2078/05/01

SN	Description	Quantity	Rate Rs.	Amount Rs.
1	Cabbage	6 kg	50	300
2	Potato	5 kg	43	215
3	tomato	3 kg	30	90
4	Chickpea	2 kg	110	220
5	Sugar	2 kg	80	160
6	Fine flour	2 kg	50	100
7	Chocolate	3 packets	150	450
8	Oil	$\frac{1}{2}$ liter	150	75
Total				1610

In words: One thousand six hundred and ten.

Kaji Sherpa
Seller

Questions:

1. When did Amit buy goods?
2. What is the cost of cabbage?
3. Out of cabbage and chocolate, whose total cost is more and by how much?
4. Which goods cost the highest amount of money?
5. What is the total bill amount?
6. What are the names of the buyer and seller?
7. How much more money did Amit need to pay if he bought 4 kg of fine flour?

2. Shyam Chaudhary and Lakpa Tamang bought the following goods from Niraula Fruit Shop on Ashar 03, 2078.

1. Shyam Chaudhary

2 kg orange at the rate of Rs. 220
3 dozen bananas at the rate of Rs. 140
2 kg of mango at the rate of Rs. 180

2. Lakpa Tamang

1 kg apple at the rate of Rs. 270
2 dozens of bananas at the rate of Rs. 140
3 kg of pomegranate at the rate of Rs. 290

(i) Prepare the bill to be received by each of them.

(ii) Who paid more amount? Find.

Project work

From your home, collect the bill of goods bought in a week. Find the goods that have

i. increased cost

ii. decreased cost

iii. fixed cost

Prepare a report.

13.2 Budget

Study the following incident.

Satyanarayan lives in Jhamsikhel, Lalitpur. He lives in his own house. He is a teacher. His wife works in an office. The first floor of his house is for rent. There is a shop at the chowk near his house. His son operates the shop. His daughter is studying nursing. It is regular that their monthly income and expenses are shared. One day, he shared the monthly income and expenses of the month of Mangsir, 2078.

Income:

(a) Monthly salary of Satyanarayan = Rs. 37,000
(b) Monthly salary of his wife = Rs. 30, 5000
(c) Rent of the first floor = Rs. 15, 000
(d) Profit from Shop= Rs. 49, 000

Expenses:

(a) Food = Rs. 35, 000
(b) Clothes = Rs. 9,000
(c) Electricity, internet, water, and petrol = Rs. 11, 500
(d) Education for daughter = Rs. 18, 500
(e) Rent of shop = Rs. 18, 500

Saving:

Saving of Mangsir = Rs. 37, 500

Answer the following question based on the information given above.

(a) What is the monthly salary of Satyanarayan?
(b) How much less is his wife's salary?
(c) What are the sources of income of Satyanarayan's family?
(d) How much is the income from the Gas and Water shop after deducting the expenses?
(e) How much is the total monthly expenses for food, clothes, and education?

(f) How much more is the rent of the shop than the rent of his first floor?

(g) Find the total income and total expenses in the month of Mangsir.

Activity 1

The daughter of Satyanarayan prepared a description of income and expenses for the month of Poush as given below.

The Budget of Poush in the Satyanarayan's family

Income		Expenses	
Sources	Amount (Rs.)	Headings	Amount (Rs.)
Salary	69,700	Food	36,500
House Rent	17,000	Clothes	11,000
Shop	58,500	Education	20,500
		Electricity, internet, water, and petrol	10,500
			22,000
Total	Rs. 145,200		Rs. 100,500

Answer the following questions based on the budget.

(a) How much is the expected income from salary in the month of Poush?

(b) How much is an increase in the salary?

(c) What are the sources of income of Satyanarayan's family?

(d) How much expense on electricity, internet, water, and petrol is expected in Poush? How much is more or less than Mangsir?

(e) How much is the expense on food, clothes, and education in Poush?

(f) What are the expected income and expenses in the month of Poush?

(g) What is the expected saving in the month of Poush?

A budget is the estimated income and expense for a fixed duration.

Activity 2

Study the monthly budget of Surjeet Kaur as given below.

Monthly Budget of Surjeet Kaur

Income		Expenses	
Sources	Amount (Rs.)	Headings	Amount (Rs.)
From Job	15,000	Foods	8,000
Selling vegetables	5,000	Clothes	6,000
Selling Chicken	2,000	Education	8,000
Selling Milk	6,000	Agricultural Materials	6,000
Selling goats	9,000	Others	5000
Total	Rs. 37,000		Rs. 33,000

Studying the budget above, the monthly income of Surjeet Kaur is Rs. 37,000. His monthly expense is Rs. 33,000. The amount after reducing expenses is the saving. Thus,
Saving = Income- Expenses
Here, the saving of Surjeet Kaur = Rs. 37,000 – Rs. 33,000 = Rs. 4,000.

What will be there if the total expense is more than the total income? (Discuss in your group.)

People prepare a family budget for conducting family smoothly. In preparing the budget, expenses are made based on the income sources. If the amount of expenses is more, then income sources are explored. If sources are not determined properly, the family needs to run in loan. If the amount of income is more than the amount of expense, then there will be saving. The saving can be used for another purpose. The budget is prepared so as to make expenses according to our income and to ensure to expenses for the most important works.

The budget is the plan of income and expenses. The budget helps to utilize the sources more effectively. A budget is prepared with a view to completing a task in a good manner.

Activity 3

Bal Binod Secondary School decides that the students of grade IV go for the field trip. There were altogether 30 persons ready for the trip including teachers and students. Rs. 500 was collected from each person. In Tihar Rs. 12,000 was collected from a cultural program namely DeusiVailo. Catering charged Rs. 700 per person for breakfast, lunch, and snacks. The bus charged Rs. 15,000 as a whole.

Based on the information, discuss in your group the preparation of a budget for the field trip and present it in your class.

Budget for Field Trip Income		Expenses	
Sources	Amount (Rs.)	Headings	Amount (Rs.)
Collection from Students Collection of DeusiVailo Support from School	....	Bus fare Catering	....
Total	Rs.		Rs. .....

The remaining amount was given by the school. How much was given by the school?

Example 1

Study the given budget table in a group. Discuss the following questions.

The Monthly Budget of John's Family

Monthly Budget of John

Income		Expenses	
Sources	Amount (Rs.)	Headings	Amount (Rs.)
Father's salary	50,000	Food items	20,000
Room rent	10,000	Clothes	10,000
From taxi	30,000	Education	15,000
		Salary to driver	20,000
		Others	10,000
Total	Rs. 90,000		Rs. 75,000

Questions

(a) What are the income sources of John's family?

(b) What is the source of the highest income?

(c) Where is John's house: in a village or town? Can you make a guess? Why?

(d) How much is the monthly income of John's family?

(e) How much is the monthly saving of John's family?

Solutions

(a) The sources of income for John's family are his father's salary, room rent, and income from the taxi.

(b) The highest income is from John's father's salary.

(c) Discus with teachers and friends.

(d) The monthly income of John's family is Rs. 90,000.

(e) The monthly saving of John's family is Rs. 90,000 – Rs. 75,000 = Rs. 15,000.

Example 2

The budget of Aayusha Tea Shop is given below. Answer the following questions based on the budget.

Monthly Budget of Aayusha Tea Shop

Income		Expenses	
Sources	Amount (Rs.)	Headings	Amount (Rs.)
Tea Selling	30,000	Tea leaf	2,000
Cake Selling	40,000	Milk	5,000
		Sugar	2,000
		Cake	30,000
		Paper cups	2000
जम्मा	Rs. 70,000		Rs. 41,000

Questions:

(a) What are the income sources of Aayusha Tea Shop?

(b) What gives the highest income?

(c) How much profit is made by selling cake?

(d) What are the expense headings of the shop?

(e) In which heading is the highest expense?

(f) How much is the monthly saving?

Solutions:

(a) The income sources of Aayusha Tea Shop are selling tea and selling of cake.

(b) The highest income is from the selling of cakes.

(c) The profit on selling cake = 40,000 – 30,000= 10,000.

(d) The expense headings are buying tea leaves, milk, sugar, cake, and paper cup.

(e) The highest amount of expenses is on buying the cake.

(f) The monthly saving is Rs. 70,000 – Rs. 41,000 = Rs. 29,000.

Exercise

1. Community Saving and cooperative organized a picnic program. The budget for a picnic is given below. Study the budget and answer the following questions.

Budget for picnic organed by the Cooperative

Income		Expenses	
Sources	Amount (Rs.)	Headings	Amount (Rs.)
Collection from participants	Rs. 40000/-	Food	Rs. 40000/-
From cooperative	Rs. 25000/-	Transportation	Rs. 8000/-
		Music system	Rs. 2500/-
		Cold drinks	Rs. 5000/-
		Awards	Rs. 4000/-
		Others	Rs. 5500/-
Total	Rs. 65000/-		Rs. 65000/-

Questions:

(a) How much is the total budget for the picnic?

(b) What are the income sources?

(c) How much is the total expense of the picnic?

(d) In which heading is the highest expense?

(e) What is the condition of income and expense in the picnic budget?

2. The monthly budget of Ramu's family is given below. Study the budget. Write answers to the following questions.

Monthly Budget of Ramu's Family

Monthly Budget of Surjeet Kaur

Income		Expenses	
Sources	Amount (Rs.)	Headings	Amount (Rs.)
Selling vegetables	Rs. 10,000	Food items	Rs. 8,000
Selling food grains	Rs. 12,000	Education	Rs. 6,000
Daily wages	Rs. 10,000	Interest of Bank	Rs. 3,000
		Communication	Rs. 2,000
		Other	Rs. 4,000
Total	Rs. 32,000		Rs. 23,000

Questions:

a) Which one is bigger in Ramu's family: Income or Expense?

b) What is the source of the highest income?

c) What is the source of the lowest income?

d) What is the heading of highest expense?

e) What is the heading of lowest expense?

3. The monthly income and expenses of Gyani Devi's family are given below.

a) Income: From a salary of Rs. 40, 000, from room rent Rs. 50, 000 and by selling vegetables Rs. 20,000.

b) Expense: For buying food items Rs. 30,000, in education Rs. 20,000, In health, Rs. 20000 and other expense is Rs. 20,000. Fill up the following budget chart.

Monthly Budget of Gyani Devi's Family

Income		Expenses	
Sources	Amount (Rs.)	Headings	Amount (Rs.)
Total			

4. The following budget is prepared for the Shiva's family for the forthcoming month. Answer the following questions based on the budget.

Monthly Budget of Shiva's Family

Income		Expenses	
Sources	Amount (Rs.)	Headings	Amount (Rs.)
Daily Wages	30,000	Food items	40,000
Selling Eggs	20,000	Clothes	15,000
Selling Chicken	60,000	Education	10,000
		Food for chicken	40,000
		Others	5,000
Total	Rs. 1,10,000		Rs. 1,10,000

Questions:

(a) What are the sources of income for Shiva's family for the coming month?

(b) What are the headings for the expenses of Shiva's family for the coming month?

(c) How much is the total income? Check whether the information budget chart is correct.

(d) How much is the total expense? Check the information in the budget chart is correct.

(e) How much will be the saving or additional expenses if the income and expenses are as per the plan?

(f) If you need to give suggestions for maintaining the budget for Shiva's family, what do you suggest? Explain with reason.

5. What are the sources of income and headings of expenses in the budget of your school? Ask your headteacher and write.

Project work

1. Find the following information with the help of your parent.

(a) What are the sources of income in your family?

(b) How much is earned from each source?

(c) What are the headings of expense in your family?

(d) How much is spent on each heading?

(e) Present the information in the following budget chart.

Monthly Budget of My Family

Income		Expenses	
Sources	Amount (Rs.)	Headings	Amount (Rs.)
Total			

2. Visit your Headteacher and ask about the budget of a project. Write the sources of income and headings of the expense of the budget.

3. Ask for the budget prepared by grade V students in a picnic program and prepare a report and present it in the classroom.

(a) Sources of income

(b) Headings of expense

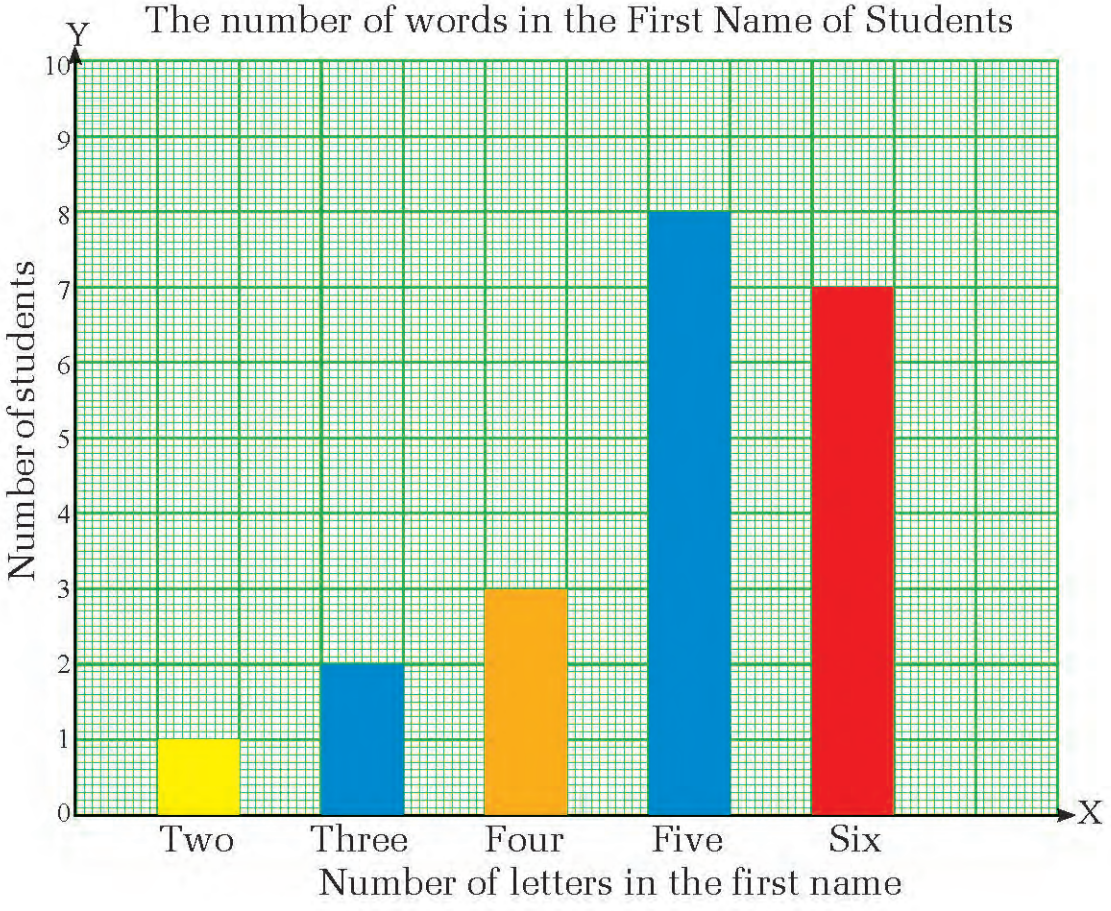
(c) Highest and the lowest amount in the income and expense

(d) Whether the expenses according to headings enough?

Lesson 14 Bar diagram

Activity 1

The number of letters in the first students in a class is presented in the following bar diagram.



Number of letters in the first name and students' number

Number of letters in the first name	Two	Three	Four	Five	Six
Number of students	1	2	3	8	7

Answer the following questions.

(i) What do the numbers written horizontally (in X) indicate?

(ii) What do the numbers written vertically (in Y) indicate?

(iii) How many students are there having two letters in their first name?

(iv) How many students are there having three letters in their first name?

(v) How many students are there having five letters in their first name?

(vi) How many more students are there having five letters than three letters in their first names?

(vii) How many letters are there in the highest number of students?

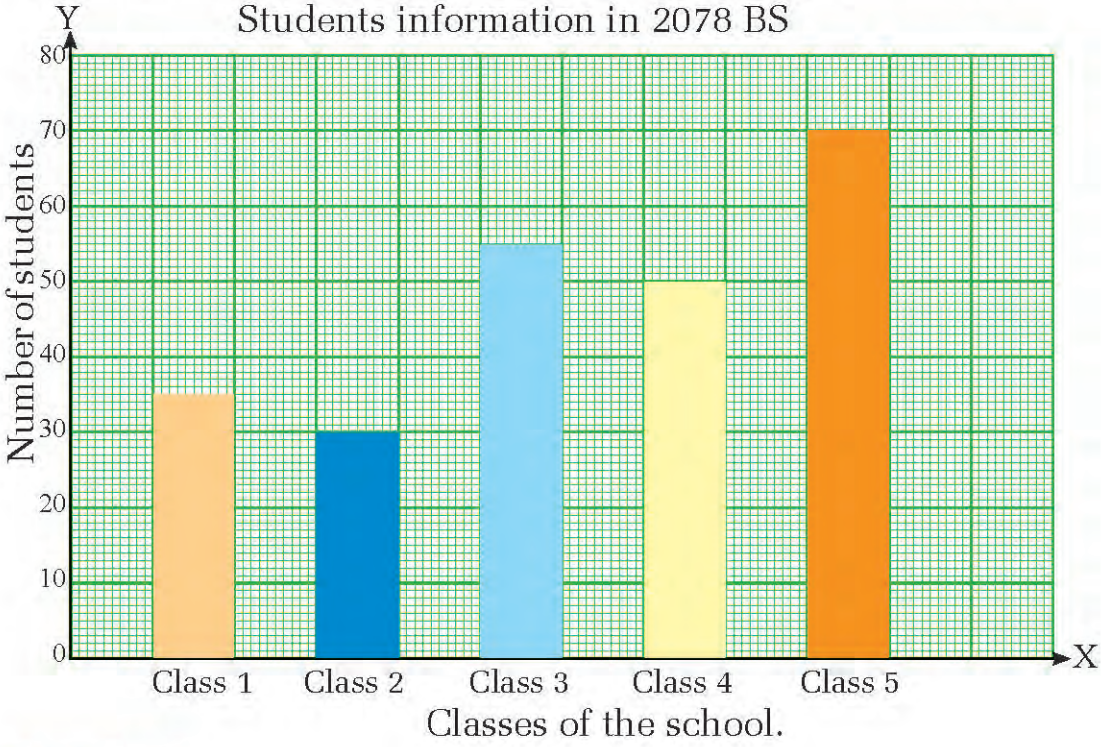
(viii) What is the table below the bar diagram?

(ix) Do the bar graph and table give the same information or different information? Discuss in a group and conclude as follows.

In a bar diagram, the information is presented by the length of rectangular shapes. The rectangles having equal breadth are presented. The longer rectangle shows the number of times repetition of the smaller one.

Activity 2

The following bar diagram is prepared by the Janata Basic School based on the students enrolled in 2078 BS from class 1 to class 5. Study the diagram and answer the following questions.



Questions:

(i) How many students are enrolled in class 1?

(ii) How many students are enrolled in class 2?

(iii) How many students are enrolled in class 3?

(iv) How many students are enrolled in class 4 and class 5 altogether?

(v) How many students are enrolled altogether?

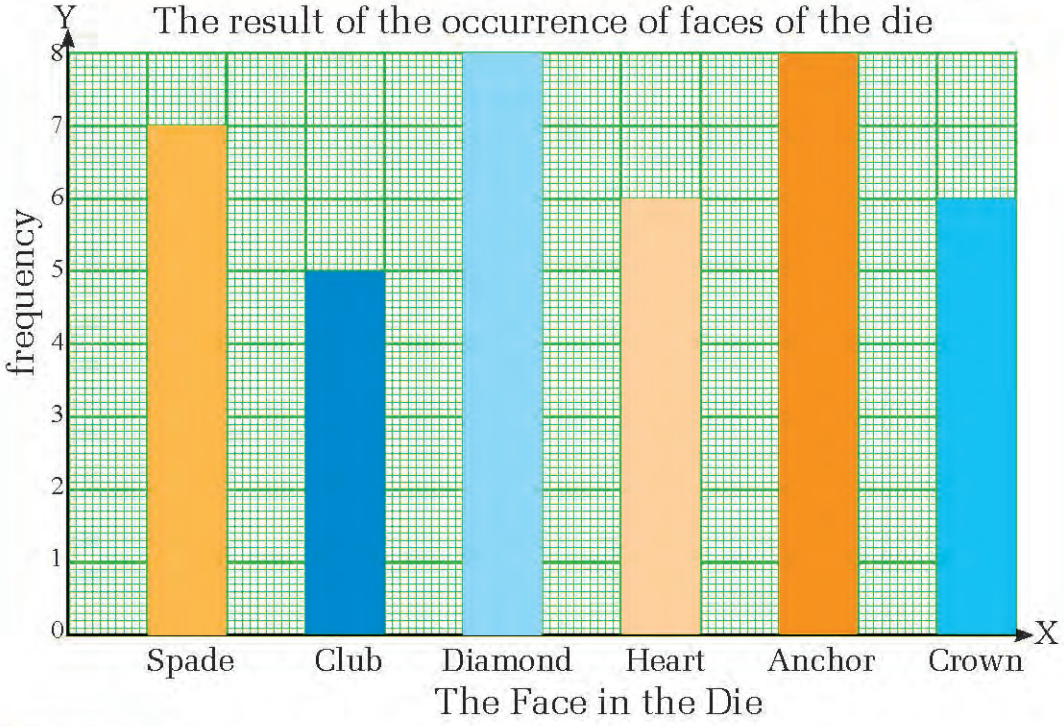
(vi) How many students are enrolled from class 1 to class 5?

(vii) Name the class having the highest number of students enrolled and the smallest number of students enrolled?

(viii) In which class 3 or 4 are more students enrolled? Find how many more it is.

Example 1

The die having six faces crown, anchor, diamond, heart, club, and spade is thrown many times and the following bar diagram is prepared based on the occurrence of the faces. Study the following bar diagram and answer the following questions.



Questions:

(i) Which face occurred most of the time?

(ii) Which face occurred the least number of times?

(iii) How many times spade occurred?

(iv) How many times was the die rolled?

(v) How many times had anchor occurred?

(vi) Which faces ccurred equally?

(vii) Which face occurred 7 times?

Solution

(i) Diamond and Anchor occurred the maximum number of times.

(ii) Club occurred the least number of times.

(iii) Spade occurred 7 times.

(iv) The die was rolled 40 times.

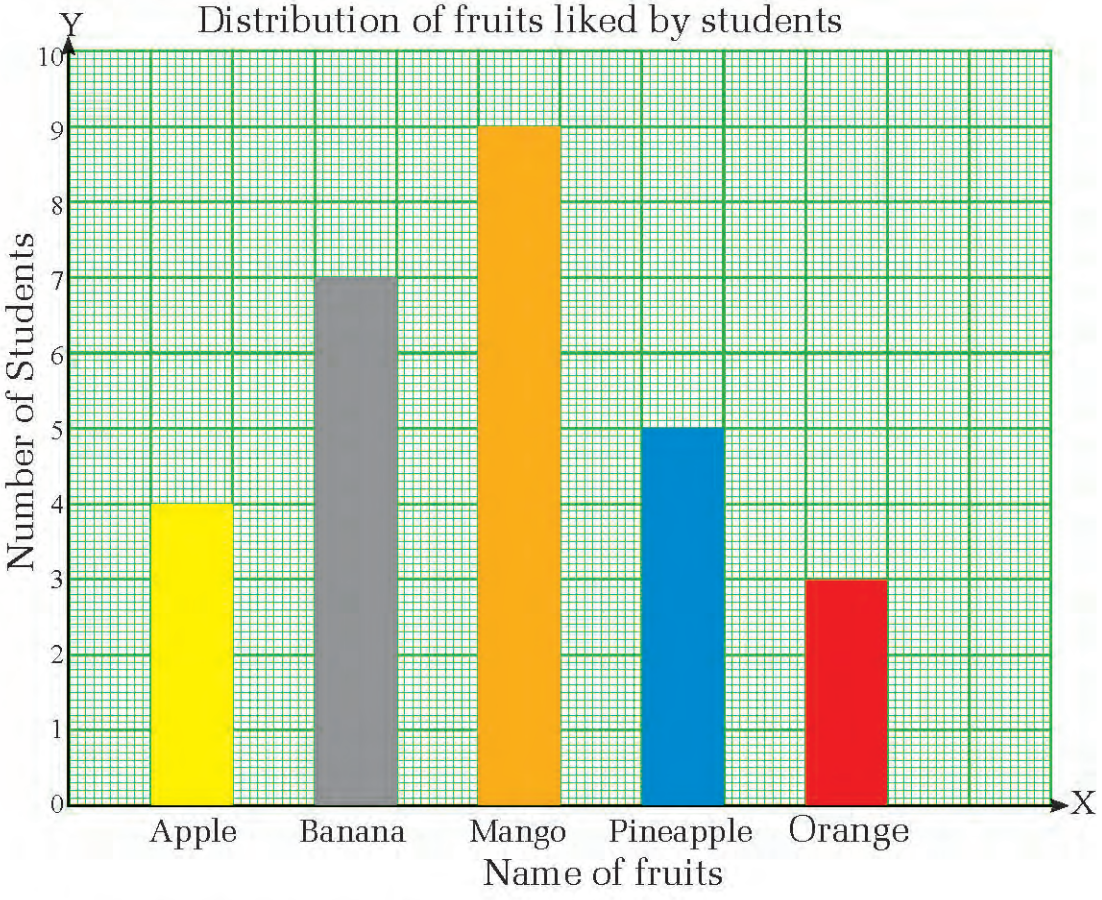
(v) Anchor occurred 8 times.

(vi) Diamond and Anchor, heart and Crown occurred qual number of times.

(viii) Spade occurred 7 times.

Example 2

The following bar diagram shows how many like what fruit. This is taken from the students of class 4. Study the figure and answer the questions given below.



(i) What is the name of most liked fruit?

(II) What is the name of the least liked fruit?

(iii) How many more students like mango as compared to the banana?

(iv) How many likes pineapple?

(v) How many students are there in class 4?

Solution

(i) Most of the students like mango.

(ii) Least of the students like orange.

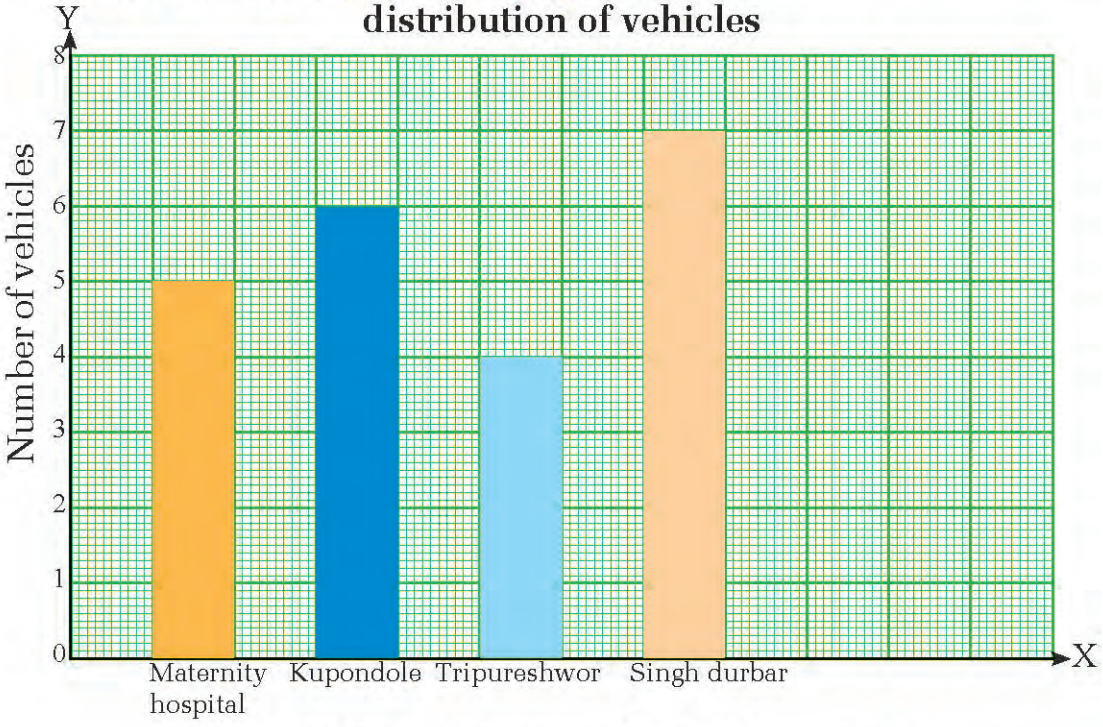
(iii) 2 more students like mango as compared to banana.

(iv) 5 students like pineapple.

(v) There are 28 students.

Exercise

1. The traffic at Thapathaili Traffic post collected the number of vehicles passing through Thapathaili in a different direction from 7:00 AM to 7:30 AM. The bar diagram is prepared based on the data. Study the diagram and answer the following question.



The direction the vehicle passes through Thapathaili

(i) How many vehicles passed towards the Maternity hospital?

(ii) In which direction did the greatest number of vehicles pass to?

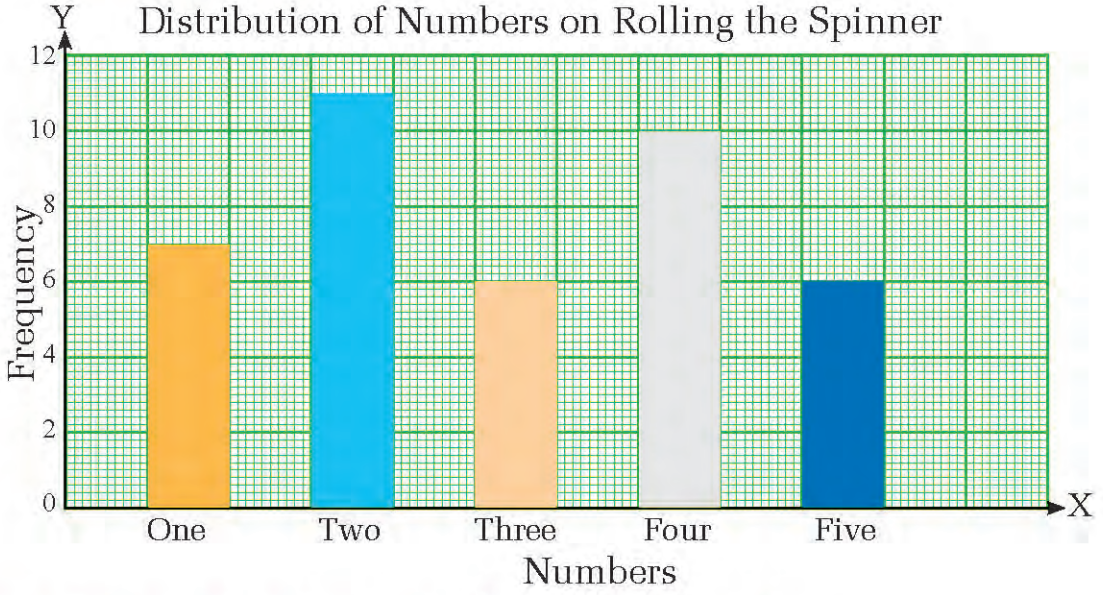
(iii) In which direction did the least number of vehicles pass to?

(iv) How many more vehicles passed through to the greatest number direction than the least number direction?

(v) How many vehicles passed towards to Kupondole?

(vi) How many total vehicles passed through the thapathali traffic from 7:00 AM to 7:30 AM?

2. The number shown by spinner is shown in the following bar diagram.



Studying the bar diagram and answer the questions.

(i) What are the numbers written in the spinner.

(ii) How many times the spinner showed

(a) one? (b) two?

(c) three? (d) four?

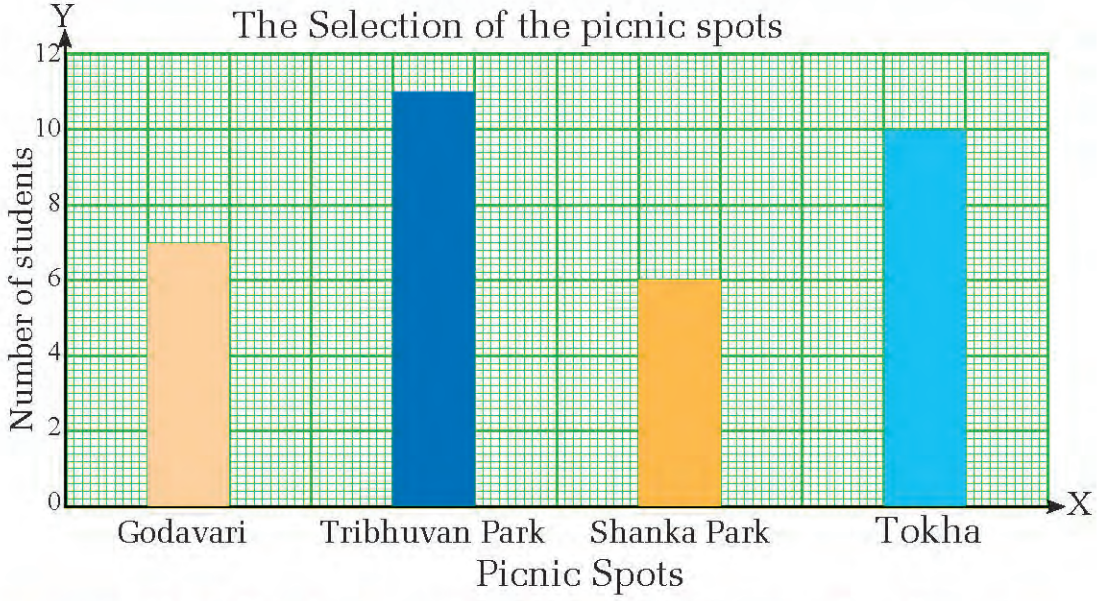
(e) five?

(iii) Which number has maximum frequency?

(iv) Which two numbers have an equal frequency?

(v) How many times was the spinner spun?

3. A school in Kathamandu valley decided to take students of class 4 for a picnic. The school asked students to choose one of the spots: Godavari, Tribhuvan Park, Shanka Park, and Tokha. The bar diagram based on the selection of students is given below.



Answer the following questions based on the given bar diagram.

(i) How many picnic sports are given there?

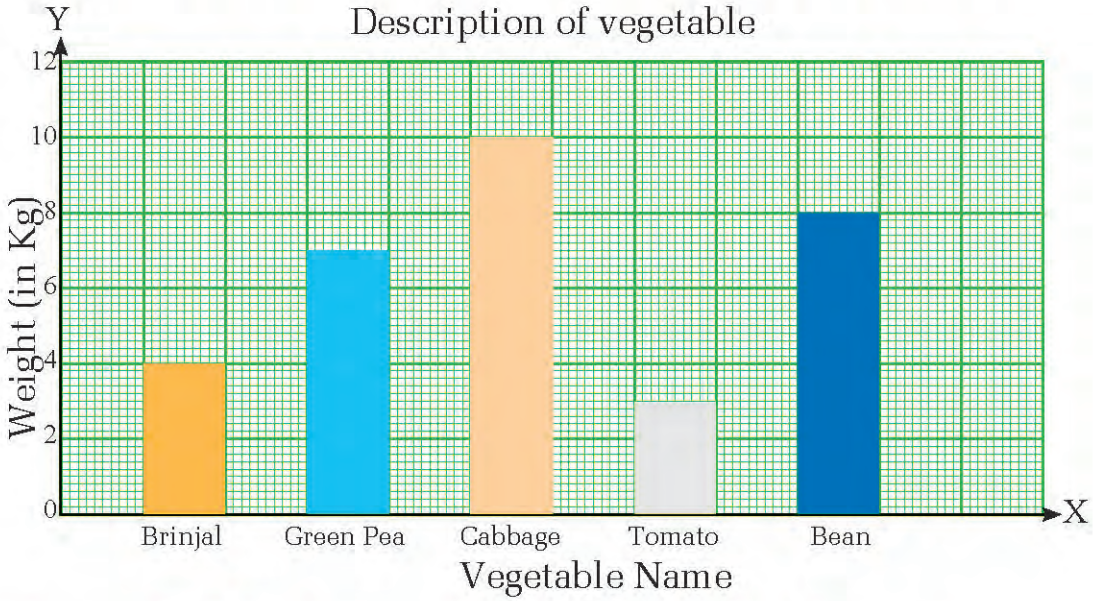
(ii) Which spot is selected by the greatest of the students?

(iii) Which spot is selected by the least number of students?

(iv) How many students were there in the survey?

(v) If there were 40 students in class 4, how many did not participate in the survey?

4. A school bought the following type of vegetables for its hostel. The information is given in the bar diagram.



Answer the following questions based on the bar diagram.

(a) What was the amount of cabbage bought?

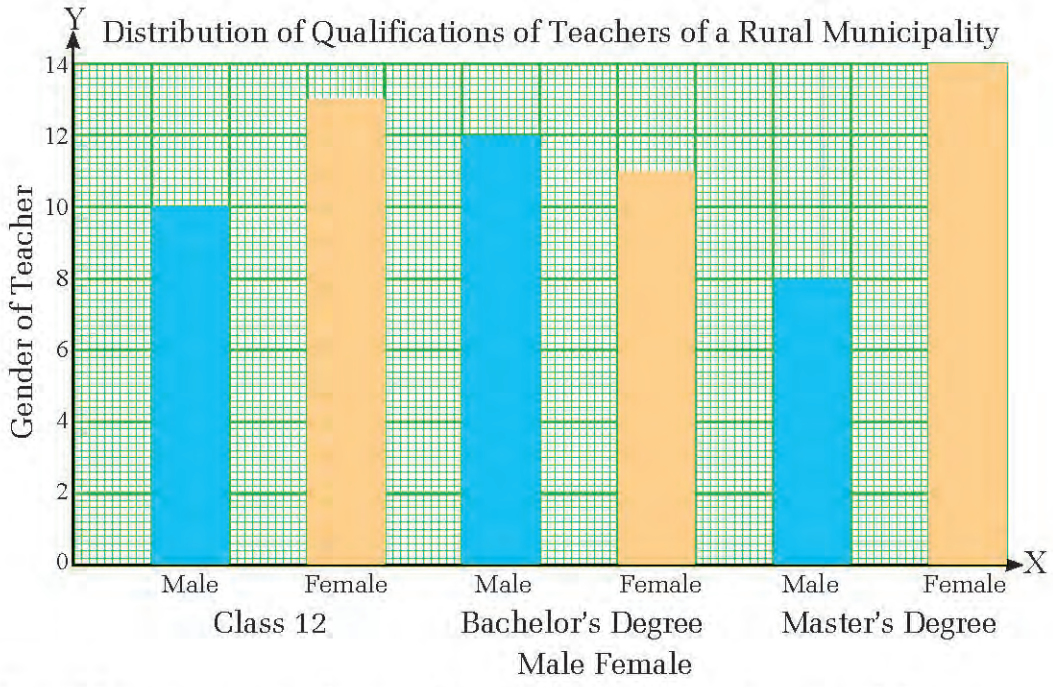
(b) What was the amount of bean bought?

(c) Why was the cabbage bought more? (Guess two reasons)

(d) What was the total kg of vegetables bought?

(e) If cabbage was Rs. 40 per kg, the tomato was Rs. 50 per kg, what was the price paid for cabbage and tomato?

5. The following bar diagram is prepared by a rural municipality related to the qualifications of teachers in the schools. Study the diagram and answer the following questions.



(i) How many male teachers are there having qualifications: class 12, bachelor's degree, and master's degree?

(ii) How many female teachers are there having qualifications: class 12, bachelor's degree, and master's degree?

(iii) Decide whether the number of male teachers or female teachers is more within the municipality.

(iv) Find the total number of teachers in the municipality.

(v) By what number the female teachers with Master's degrees are more than the male teachers with master's degrees?

Project work

Prepare the bar diagram based on the students enrolled in the previous academic year. Prepare a report by answering the following questions.

(a) The class in which the highest number of students enrolled.

(b) The class in which the highest number of students enrolled.

(c) In which class the number of females is more than the number of male students?

(d) How many students enrolled altogether?

(e) Total girl students, total boy students, etc.

Exercise

1. Circle (O) the correct answer.

(i) If Krishna bought two kg of apples at the rate of Rs. 180 from a fruit shop in Kathmandu, what should be mentioned in the description of the bill?

(a) Krishna (b) Apple (c) Rs. 180 (d) 2 kg

(ii) Sonam bought 5 kg of black-gram beans for Rs. 800. What should be mentioned in the rate column of the bill?

(a) 5 kg (b) Rs. 800 (c) Rs. 160 (d) 4000

(iii) How do we find the number to be written in the column "Amount Rs."?

(a) By multiplying quantity and rate
(b) By adding quantity and rate
(c) By dividing the quantity by rate
(d) By subtracting rate from quantity

(iv) In a bar diagram the number of students from class 1 to 5 are presented. Where should the class be written in the diagram?

(a) Vertical right (b) Above heading
(c) Below horizontal (d) vertical left

(v) The number of students in class 9 is the largest and the number of students in class 2 is the smallest, in Kailash Secondary school, Khotang. Which one of the following is correct?

(a) The highest bar is for class 9 and the lowest bar is for class 2.
(b) The lowest bar is for class 9 and the highest bar is for class 2.
(c) The highest bar is for class 10 and the lowest bar is for class 1.

(d) The heights of the bars of class 9 and class 2 are equal.

(vi) Which one of the following is NOT in the budget?

(a) Heading (b) Income

(c) Expenses (d) Name of Shop

2. Answer the questions by studying the bills.

(A)

Pan No. 2544443 Bill No.053

Janakpur Grocery Store
Janakpurdham, Nepal

Date:2078/04/20

Buyer: Ram Lakhan Chaudhary

SN	Description	Quantity	Rate Rs.	Amount Rs.
1.	Rice	25 kg	90	2250
2.	Red Lentil	2 kg	150	300
3.	Oil	1 *l*	270	270
4.	Biscuits	1 packet	100	100
Total				2920

In Words: Two thousand nine hundred and twenty.

Goma

Seller

Questions:

(i) When was the goods bought?

(ii) Who bought the goods?

(iii) How much was spent on buying goods?

(iv) What were the goods bought by Ram Lakhan?

(v) If Ram Lakhan bought rice of 20 kg, what would be the total bill amount?

(vi) If Ram Lakhan had only Rs. 2500, Ram Lakhan could not buy on credit, what goods he could buy?

(B)

Pan No. 2555521 Bill No. 043

R.K. Book Shop
Diktel, Khotang,

Date: 2078/04/12

Buyer: Jema Rai

SN	Description	Quantity	Rate Rs.	Amount Rs.
1.	Geometry box	1 pc	180	180
2.	Notebook	12 doz	50	600
3.	Pen	3 pcs	20	60
4.	Pencil	5 pcs	10	50
Total				890

In Words: Eight hundred and ninety.

Gagan
Seller

Questions:

(i) What is the total bill amount?

(ii) If Jema gave Rs. 1000, then how much was the return?

(iii) If she did not buy the Geometry box, what would be the total bill amount?

(iv) How much shuld be paid for buying a notebook and pen only?

(v) How much more is the cost of a geometry box than a pencil?

(vi) If she would buy 1 dozen pencils, how much would be the bill amount?

(vii) If she would buy a dozen of pencils and gave Rs. 1000, then how much would be the return?

3. The annual budget of Mohammad's family is given below.

Annual Budget of Mohammad's Family

Income		Expenses	
Sources	Amount (Rs.)	Headings	Amount (Rs.)
Salary	4,00,000	Food items	1,20,000
Agricultural Products	50,000	Education	60,000
Others	20,000	Medical treatment	70,000
		Clothes	40,000
		Others	60,000
Total	4,70,000	Total	3,50,000

Questions

(i) How much is the total income?

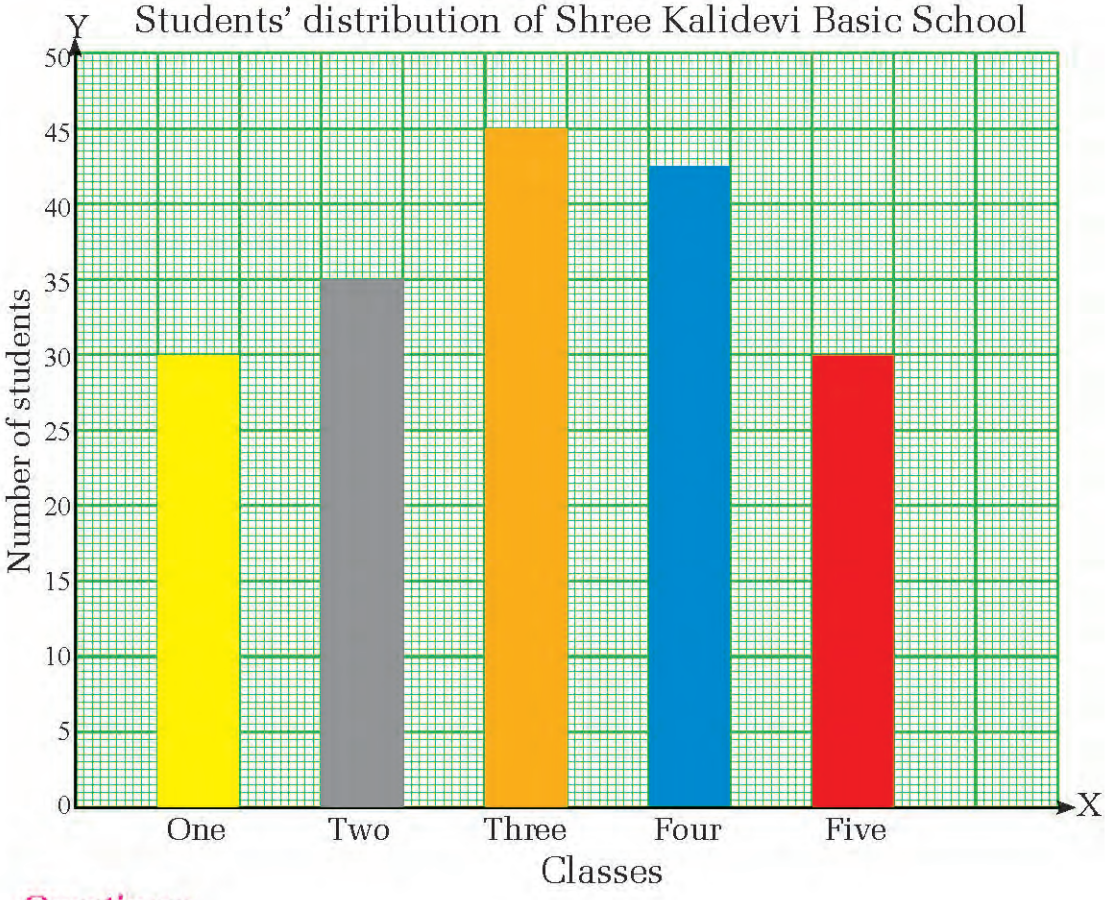
(ii) How much is the total expense?

(iii) Which one is greater: Income or expenses?

(iv) What would be at the end of the year: Saving or loan?

(v) How much would be the saving or loan?

4. Look at the bar diagram below. Answer the questions.



Questions:

(i) Write down the number of students in each class.

(ii) Which classes have an equal number of students?

(iii) Which class has the maximum and minimum number of students?

(iv) How many new students are to be enrolled in class 5 to make the number of students equal to class 3?

(vi) Find the total number of students in Kaladevi Basic School?

(vi) How many new students are to be admitted to make a total of 200 students?

Lesson 15 Algebra

15.1 Review

Discuss how the following statements be written in mathematical form.

(a) When 2 is added to 8, it becomes 10.

(b) When 2 is subtracted from 10, then it is 8.

(c) When 8 is multiplied by 2, the result is 16.

(d) When 16 is divided by 8, then the result is 2.

Write some other mathematical statements. Ask friends to write in mathematical forms. Check whether the mathematical expressions are correct or not.

15.2 Addition and subtraction in box notation

Activity 1

(A) Finger Raising Game

Be in pairs and sit face-to-face with each other. One of you raises the fingers of your one hand and the other friend keeps your one hand with a fist. The first friend loudly says the sum six or less than six or 1 or more than one. The friend with a fist raises fingers from the fisted hand so that sum becomes as per the announcement. Play the game 5-5 times. The student who correctly raises the fingers more times will win the game.
This can be varied by raising 2, 3, 4, and 5 fingers by the first player and fixing the sum accordingly. For example,

Question Phase

The sum of fingers is 6.

The five fingers of the second hand are raised.

Answer Phase: ☐

Mathematical Meaning: What should be added to 1 to make 6?

This can be written as:

To what number 1 can be added so that the result is 6? ☐ + 1 = 6

The answer is correct. So, got 1 point.

If the other number of fingers were raised, then there would be incorrect. There would be no point in such a case.

Similarly, in 5-5 play who gets the maximum number will win the game.

Question	Meaning	Answer
 The sum of fingers is 6	What should be added to 1 to make it 6? 1 + ☐ = 6 To what 1 should be added to make 6? ☐ + 1 = 6	 5 should be added to 1 to make it 6. 1 + 5 = 6 To 5 when added 1 it becomes 6 5 + 1 = 6

(B) Let's Play Game: Number in My Next Hand

Be two friends face to face. One person keeps 2 objects (for example, beans) in a hand and 8 objects in another hand. Show the hand with 2 objects (beans) and keep fisted the hand with eight objects (beans). Ask "How many are there in my second hand?" if I have total of ten objects (beans). If your friend answers correctly, then she or he gets a point. Play 5-5 times, and who gets more points in total will win the game.

The question asked in the game can be written in mathematical form as

2 + ☐ = 10

☐ + 2 = 10

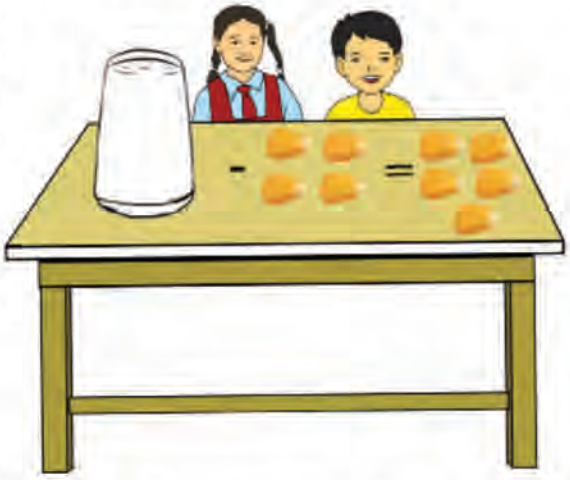
The game can be played with variations.

Required materials: some number of objects (such as Beans) and plates.

Activity 2

Let's Play Game: How many Inside the Cup

Sit two friends at one side of the table as shown in the figure. put a cup on the table. Put 4 pieces of maize on the side of the table as shown in the figure. Then, put 5 pieces of maize on the table. Then, ask questions to friends, "How many maizes are there inside the cup?".Make the following rules: Who answer correctly at first will get 2 points, who gives a correct answer lately gets 1 point and 0 point for an incorrect answer. Make the students play the game for 10 times and the students who get the highest points will win the game.



For example,

Question: If four maizes are taken from inside the cup, there are five inside the cup. How many pieces of maizes were there before?

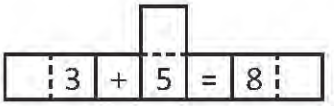
On writing mathematical form, $\square - 4 = 5$

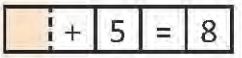
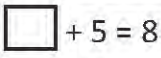
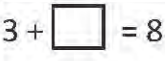
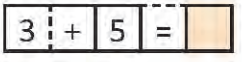
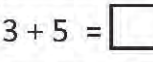
In the same way, after asking 10 questions, based on the answers given by friends, announce the winner according to the rule of the game.

This game can be played in another way.
Out of 6 maizes, if 2 are kept inside t
how many are there?

Activity 3

Take a rectangular paper strip. Keep doing the following activities as shown. You can fold the paper on the dotted sign.

Material 

Material	In Box symbol	Meaning
		What should be added to 5 to make it 8?
		What should be added to 3 to make it 8?
		What is there if 3 is added to 5?
		What added to what becomes 8?

Play with yout freinds creating teaching aids to cost the mathematical sentences given below.

(i)	3 + 2 = 5	(vi)	6 + 4 = 10
(ii)	7 + 3 = 10	(vii)	2 + 5 = 7
(iii)	2 + 6 = 8	(viii)	4 + 5 = 9
(iv)	3 + 6 = 9	(ix)	4 + 2 = 6
(v)	2 + 8 = 10	(x)	5 + 3 = 8

Example 1

Write the value of $\square$ to each of the following problems.

(i) $\square + 5 = 9$

(ii) $9 - \square = 4$

Solution

(i) Keep the values of $\square$ from 1, 2, 3, and so on. Stop when the sum is 9.

$\boxed{1} + 5 = 6$, Not a 9

$\square + 5 = 7$, Not a 9

$\square + 5 = 8$, Not a 9

$\square + 5 = 9$, Therefore $\square = 4$

(ii) $9 - \square = 4$

Put the values of [ ] from 1, 2, 3 until you get $9 - [\ ] = 4$. For,

$9 - \square = 8$, Not a four

$9 - \square = 7$, Not a four

$9 - \square = 6$, Not a four

$9 - \square = 5$, Not a four

$9 - \square = 4$, Therefore $\square = 5$

In the above problems, the number is replaced by $\square$ (box). This is called a box notation.

Example 2

Write the following mathematical statement in box notation. Write the appropriate number in the box.

(i) Rita had some pencils. When her mother added 2 pencils, she had 6 pencils altogether.

(ii) What should be added to 6 to make 10?

(iii) Hari Narayan had 9 chocolates. The teacher added some chocolates. He had now 11.

(iv) Sujan had brought some pieces of bread for a snack. He gave 2 pieces of bread to friends, and he has 4 remained with him.

(v) What should be subtracted from 9 to get 5?

(vi) Sarala had some of the hair bands. She gave 7 to friends and she has 3 remained now.

Exercise

1. Test different numbers in the box ☐ and find the correct number in the box.

(i) ☐ + 6 = 9 (ii) ☐ + 4 = 10

(iii) 5 + ☐ = 8 (iv) 7 + ☐ = 12

(v) 6 + ☐ = 11 (vi) ☐ + 8 = 13

2. Find the value of ☐ from the given relations.

(i) 2 + 5 = ☐ (ii) 3 + 7 = ☐

(iii) 6 + ☐ = 9 (iv) 6 + ☐ = 8

(v) ☐ + 3 = 10 (vi) ☐ + 5 = 10

3. **From 2 + 6 = 8, we can make the following problems:**

(i) ☐ + 6 = 8

(ii) 2 + ☐ = 8

(iii) 2 + 6 = ☐

(iv) Similarly, (from the following mathematical statement) write three problems using the box.

(a) 5 + 4 = 9

(i) ---------- (ii) ---------- (iii) ----------

(b) 7 + 2 = 9

(i) ---------- (ii) ---------- (iii) ----------

(c) 8 + 7 = 15

(i) ---------- (ii) ---------- (iii) ----------

(d) 9 + 8 = 17

(i) ---------- (ii) ---------- (iii) ----------

4. Write the value of ☐ in each of the cases.

(i) 9 - 2 = ☐ (ii) 12 - 8 = ☐

(iii) 15 - ☐ = 8 (iv) 18 - ☐ = 7

(v) 18 = 20 - ☐ (vi) 21 = 21 - ☐

5. Write as given below.

☐ + 2 = 6

What should be added to 6 to make 6? [4] + 2 = 6

(a) (i) ☐ + 2 = 6 (ii) ☐ + 7 = 12

(iii) 6 + ☐ = 10 (iv) 9 + ☐ = 11

(v) 5 + 7 = ☐ (vi) 8 + 6 = ☐

(b) (i) ☐ - 4 = 2 (ii) ☐ - 5 = 7

(iii) 6 - ☐ = 1 (iv) ☐ - 8 = 4

(v) 9 - 4 = ☐ (vi) 10 - 3 = ☐

6. Write the possible values of a and b in positive numbers.

(i) a + b = 8 (ii) a - b = 2

(Do not take a more than 6)

(i) Find two of the values of a and b for which both (i) and (ii) are true.

7. In the following cases, use a box or letter to write in mathematical form. Find the value of the box or letter.

(a) What should be added to 18 to make 29?

(b) Dorje has 15 marbles. By adding some marbles, he has 27 marbles in total. How many marbles are added?

(c) Bijita had some chocolates and gave 12 of them to Binaya. She had 18 chocolates remaining. Find how many chocolates were at the beginning.

(d) There were 50 bunch of flowers. Sanchita made a garland for her brother. 15 bunches were remained. Find how many bunches of flowers were used.

15.3 Multiplication and Division using Box Notation

Activity 1

Write the following questions in mathematical form and discuss.

(i) Yubraj distributed 20 chocolates to his four friends equally on his birthday. How many chocolates were given to one friend?

(ii) Adarsha Basic School distributed 2/2 notebooks to each of the girl students of class 4 to motivate for regularity. The total number of notebooks distributed was 18. Find how many girl students were there in class 4.

(iii) In Tihar, a group of friends participated in Bhailo. They collected Rs. 120. They divided equally among each member, and each got Rs. 15. Find how many were there in the group.

(iv) Shankar's daughters decided to use an equal amount of money to celebrate the birthday of their father and mother. Out of the amount collected in their Piggybank, they spent Rs. 275 on their mother's birthday. Find how much money was there in the Piggybank.

Writing above problems using box notation and solving,

(i) $\square \times 4 = 20$, 4, what should be multiplied by 4 to get 20?

$\square$ Putting 1, 2, 3, ... on the box and testing whether it is true or not.

$\boxed{1} \times 4 = 20$, false

$\boxed{2} \times 4 = 20$, false

$\boxed{3} \times 4 = 20$, false

$\boxed{4} \times 4 = 20$, false

$\boxed{5} \times 4 = 20$, false

Therefore, 5 should be there in $\square$.

(ii) $2 \times \square = 18$

Here, what should be multiplied by 2 to get 18?

As in (i),

$2 \times \boxed{9} = 18$

So, there should be 9 in the box

(iii) $120 \div \square = 15$

What should divide 120 to get result 15?

As in (i) put the values 1, 2, 3, ... in the box $\square$ and test for the true value.

$120 \div \boxed{1} = 15$ False

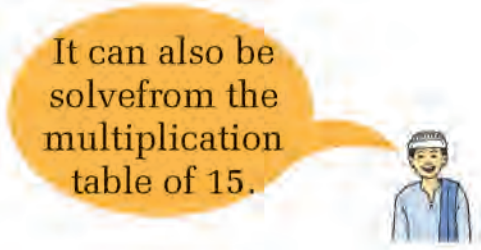
$120 \div \boxed{2} = 15$ False

$120 \div \boxed{3} = 15$ False

$120 \div \boxed{4} = 15$ False

⋮

$120 \div \boxed{8} = 15$ True



Therefore, the value of the box [ ] is 8.

When 15 is multiplied by 8, the result will be 120.

$120 \div \boxed{8} = 15$ True

(iv) $\square \div 2 =$ Rs. 275

Here, what should be divided into two equal parts so that one part is 275.

This can be expressed as

If one part is 275, what will be two parts?

Rs. $275 \times 2 = \square$

Therefore the value of the box $\square$ is 550.

Example 1

What should be multiplied by 2 to make it 6?

This can be written in the box notation as below:

$2 \times \square = 6$

What should be in the box?

By using the trial and error method, put 1, 2, 3, ... in the place of the box and check.

$2 \times \boxed{1} = 6$ False

$2 \times \boxed{2} = 6$ False

$2 \times \boxed{3} = 6$ True. Therefore, $\square$ is 3.

Example 2

When 12 apples are divided among 4 persons equally. How many will each person get?

By writing this problem in box notation

$12 \div 4 = \square$

What should be in the box?

This can be written as $\square \times 4 = 12$

From the multiplication table, $4 \times 3 = 12$

Therefore, there is 3 in the box.

Therefore, $12 \div 4 = \boxed{3}$

From the multiplication table of 4

$4 \times 1 = 4$
$4 \times 2 = 8$
$4 \times 3 = 12$

Example 3

To how many persons should 15 chocolates be distributed equally so that each gets 5.

By writing the problem in box notation

$15 \div \square = 5$

Putting the values of $\square$ as 1, 2, 3 and we get,

$15 \div \boxed{1} = 5$ False

$15 \div \boxed{2} = 5$ False

$15 \div \boxed{3} = 5$ False

From the multiplication table of 5F

$5 \times 1 = 5$
$5 \times 2 = 10$
$5 \times 3 = 15$
$5 \times 4 = 20$
$5 \times 5 = 25$

Therefore, the ☐ is 3.

The above problem can also be written as $5 \times \square = 15$

By multiplication table of 5, $5 \times 3 = 15$

Therefore, in $15 \div \square = 5$

The box is 3. ☐

Exercise

1. Write the value of ☐ in each of the following cases.

(i) $5 \times \square = 15$ (ii) $7 \times \square = 28$

(iii) $\square \times 6 = 18$ (iv) $\square \times 9 = 36$

(v) $9 \times 3 = \square$ (vi) $8 \times 4 = \square$

2. Write the value of box in the box in each of the following cases.

(a) $16 \div 4 = \square$ (b) $21 \div 3 = \square$

(c) $18 \div \square = 3$ (d) $20 \div \square = 5$

(e) $\square \div 5 = 5$ (f) $\square \div 4 = 8$

3. Write the correct value of the box with numbers and signs (×, ÷) in the following cases.

(i) $18 \square 3 = 6$ (ii) $15 \square 3 = 5$

(iii) $2 \square 8 = 16$ (iv) $8 \times \square = 48$

(v) $\square \times 3 = 27$ (vi) $45 \div \square = 9$

(vii) $32 \div 4 = \square$ (viii) $\square \div 5 = 8$

4. Solve the following problems using box notation.

(i) 5 pencils are kept in each group. How many groups will be there from 30 pencils?

(ii) 10 chocolates are kept in each packet. How many packets will be there from 40 chocolates?

(iii) 3 erasers are kept in each group. How many groups will be there from 30 erasers?

(iv) 20 oranges are distributed equally among 4 persons. How many oranges will each get?

(v) 30 chocolates are distributed to 6 persons equally. How many chocolates will each person get?

(vi) 36 chocolates are distributed at the rate of 9 to each person. How many people will get chocolates?

(vii) 5 biscuits are kept at a time in a box. How many times will there be 40 biscuits?

(viii) From a packet of marbles, 10 marbles are taken out at a time. All marbles are taken out six times. Find how many marbles were there in the packet.

(ix) From a box of biscuits, on distributing 8 biscuits per person, 10 persons got the biscuits. Find how many biscuits were there in the box.

(x) Tahira Begam distributed chocolates to 30 students on her birthday equally. She noticed 120 chocolates were distributed. Find how many chocolates each got.

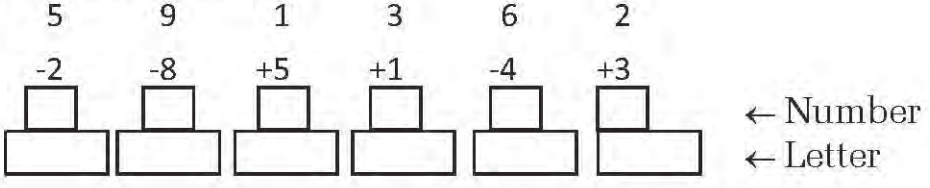
Project work

1. The English letters are replaced by the numbers (CODE).

A	E	F	H	R	T
1	2	3	4	5	6

Find the value of [ ] in each of the problems. Write an English letter to denote the value of the box (DECODE).

What word is formed?



(a) Similarly, code and decode family members mathematically.

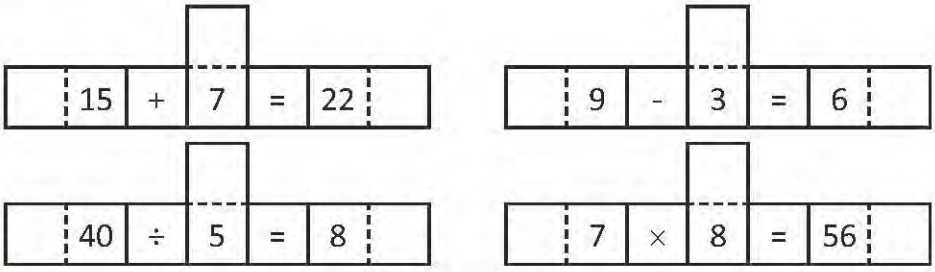
(b) In the given CODED and DECODED expression

A	E	F	H	R	T
1	5	6	8	18	20

Use the code to express FATHER.

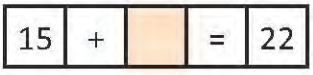
2. Take 3/3 rectangular strips of paper. Use box notation to write a mathematical sentence and ask a friend in your class.

For example,



3. Write a practical problem based on the above mathematical problem shown by any one of the students. Present in the class.

For Example:



Jahir's mother gave Rs. 15 to him to eat a snack. How much should be added by his father so that he will have Rs. 22?

15.4 Introduction to variables and constants

Activity 1

Study the following situation or incidents. Renuka teaches Mathematics to class 4 in a basic school. She measured the height of the boys and presented it in the following table.

Name of boy	Utsav	Sohan	Aaditya	Ishwar	Buddha	Sanjeev	Salman	Ramlal	Jahid
Height (cm)	125 cm	135 cm	131 cm	121 cm	138 cm	129 cm	127 cm	134 cm	139 cm

If x is the height of boy students, what is the value of x ? She asked.

Each boy replied their height turn by turn.

What is the value of x in the above case? What is x called? Discuss.

Here, x denotes the height of boy students of class 4.

When asked about Utsav's height, x is 125 cm.

Similarly, when asked about Sohan's height, x is 135 cm.

When asked Aaditya's height, x is 131 cm.

When asked Ishwar's height, x is 121 cm.

When asked Buddha's height, x is 138 cm.

When asked Sanjeev's height, x is 129 cm.

When asked Salman's height, x is 127 cm.

When asked Ramlal's height, x is 134 cm.

When asked Jahid's height, x is 139 cm.

Here, the value of x is different for a different question.

Activity 2

Find the value of y in the following conditions. What is *a* called? Discuss.

(a) When 6 is added to y, the sum is more than 10.

Here, y = 5, 6, 7, ...

Here, y represents 5, 6, 7, and so on.

(b) When y is subtracted from 15, the result is more than 10.

Here, y = 1, 2, 3, and 4.

Here, y represents 1, 2, 3, and 4.

(c) When 5 is multiplied with y, the result is more than 10.

Here, y = 3, 4, 5, ...

Here, y represents 3, 4, 5, and so on.

(d) When 30 is divided by y, the result is less than 10.

Here, y = 5, 6, 10, 15, and 30.

Here, y represents 5, 6, 10, 15, and 30.

In algebra, letters can be used in place of a number. Here, the value of *y* is different in a different case.

If the value of a letter is different in a different case, then the letter is called a variable. If the value of a letter is fixed, then it is called a constant. For example, in the above cases, the value of y is different in different cases, the variable y is variable. But the numbers used in the above cases are fixed. So, they are constant. For example: 2, 3, 4, 5, 10, ...

Activity 3

Study the calendar. Page of the month of Baishakh, 2078

Calendar of Baishakh, 2078

Discuss in your class. Find the answers to the following questions.

विवाहमुहूर्तहरू: १०, ११, १७ र २४ गते	५ 18 षष्ठी	१२ 25 त्रयोदशी	१९ 2 षष्ठी	२६ 9 त्रयोदशी	आइतबार Sunday
	६ 19 सप्तमी	१३ 26 चतुर्दशी	२० 3 सप्तमी	२७ 10 चतुर्दशी	सोमबार Monday
	७ 20 अष्टमी	१४ 27 पूर्णिमा	२१ 4 अष्टमी	२८ 11 औंसी	मङ्गलबार Tuesday
१ 14 द्वितीया	८ 21 नवमी	१५ 28 चौलागा प्रतिपदा	२२ 5 नवमी	२९ 12 वछलाथ्व प्रतिपदा	बुधबार Wednesday
२ 15 तृतीया	९ 22 लोकतन्त्र दिवस दशमी	१६ 29 तृतीया	२३ 6 दशमी	३० 13 द्वितीया	बिहीबार Thursday
३ 16 चतुर्थी	१० 23 एकादशी	१७ 30 भूमिक दिवस चतुर्थी	२४ 7 एकादशी	३१ 14 तृतीया	शुक्रबार Friday
४ 17 पञ्चमी	११ 24 द्वादशी	१८ May 1 पञ्चमी	२५ 8 द्वादशी		शनिबार Saturday

(i) How many Sundays are there? If x represents the date having Sunday, what will be the value(s) of x?

(ii) How many democracy days are there in the month? On what date is democracy day?

Here,

As x represents the date having Sunday. The dates are 5, 12, 19, and 26.

If x is the first Sunday, then it is 5.

If x is the second Sunday, then it is 12.

If x is the third Sunday, then it is 19.

If x is the fourth Sunday, then it is 26.

Here, the value of x is different in a different situation. Democracy day is only one a year. Which is on Baishakh 11. It is always on Baishakh 11. This is only one fixed value.

Example 1

Based on the Calendar page of Baishakh, 2078, tick (√) the appropriate answer.

(i) n represents the day of the new year. | Variable | Constant |

(ii) If w denotes the date having Wednesday, what is w? | Variable | Constant |

(iii) If s denotes the date having Saturday, what is s? | Variable | Constant |

(iv) If m denotes the International Labour Day, what is m? | Variable | Constant |

(v) If t denotes the dates having Thursday, what are the values of t. Write.

Solution

(i) There is only one new year. That is the Baishakh 1. Therefore, it is √ | Variable | Constant |

(ii) There are 5 Wednesdays in the month of Baishakh. They are on 1, 8, 15, 22, and 29. Thus, w can be any of 1, 8, 15, 22, and 29. Therefore, | Variable | Constant |

(iii) (iii) The Saturdays are 4, 11, 18, and 25. When s denotes Saturday, then s is variable. | Variable | Constant |

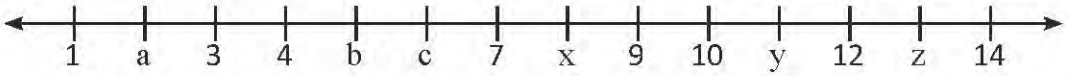
(iv) International Labour Day is on May 1 and occurs only once a year. This day is Baishakh 18. When m denotes the

International Labour Day, m is constant. | Variable | Constant |

(v) t denotes the Thursday. There are 5 Thursdays on Baishakh, 2078. They are on the dates: 2, 9, 16, 23, 30.

Exercise

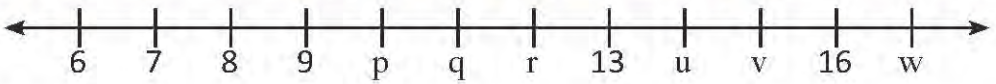
1. Find the value of a, b, c, ..., x, y, z, etc. from the given number line.



a = _____ b = _____ c = _____

x = _____ y = _____ z = _____

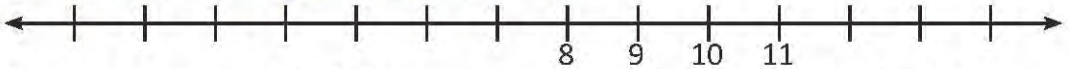
2. Find the value of p, q, r, ..., u, v, w from the given number line.



p = _____ q = _____ r = _____

u = _____ v = _____ w = _____

3. Based on the given number line



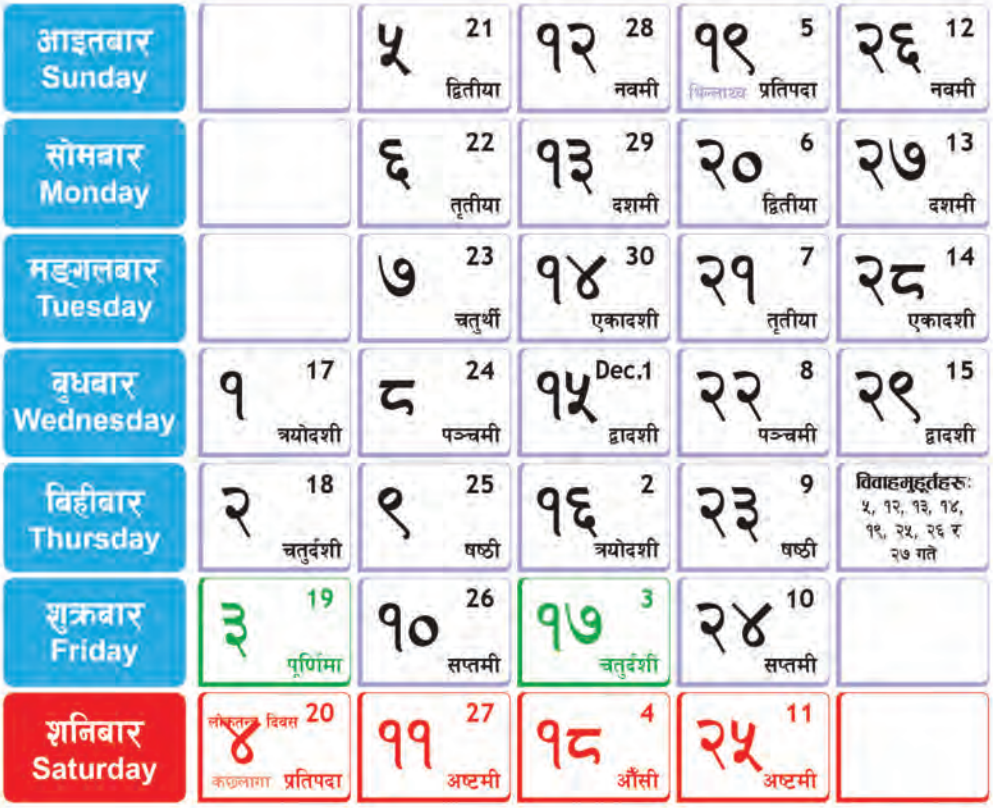
(i) x lies 3 units left from 8. Show its value and position on the number line. x =

(ii) y lies 4 units right of 10. Show the position of y on the number line and write its value. y =

(iii) z lies 2 units right of 11. Show the position of z on the number line and write its value. z =

(iv) w lies 5 units left of 9. Find the value and position of w on the number line.

4. The figure is the calendar of Mangsir, 2078 BS.



आइतबार Sunday		५ 21 द्वितीया	१२ 28 नवमी	१९ 5 प्रतिपदा	२६ 12 नवमी
सोमबार Monday		६ 22 तृतीया	१३ 29 दशमी	२० 6 द्वितीया	२७ 13 दशमी
मङ्गलबार Tuesday		७ 23 चतुर्थी	१४ 30 एकादशी	२१ 7 तृतीया	२८ 14 एकादशी
बुधबार Wednesday	१ 17 त्रयोदशी	८ 24 पञ्चमी	१५ Dec.1 द्वादशी	२२ 8 पञ्चमी	२९ 15 द्वादशी
बिहीबार Thursday	२ 18 चतुर्दशी	९ 25 षष्ठी	१६ 2 त्रयोदशी	२३ 9 षष्ठी	विवाहमुहूर्तहरू: ५, १२, १३, १४, १९, २५, २६ र २७ गते
शुक्रबार Friday	३ 19 पूर्णिमा	१० 26 सप्तमी	१७ 3 चतुर्दशी	२४ 10 सप्तमी	
शनिबार Saturday	लोसुङ नयाँ वर्ष 20 ४ कृष्णलागा प्रतिपदा	११ 27 अष्टमी	१८ 4 औंसी	२५ 11 अष्टमी	

Answer the following questions based on the calendar.

(a) If x denotes the dates having Sunday, then what is x: variable or constant?

x is _____.

(b) If y denotes the dates having Friday, then what is y: variable or constant?

y is _____.

(c) If z denotes the dates having Monday, then what is z: variable or constant?

z is _____.

(d) If s denotes the dates having Saturday, then what is s: variable or constant?

s is _____.

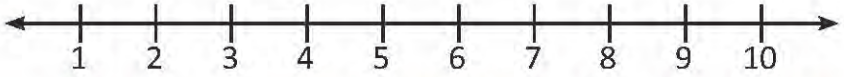
(e) If h denotes the dates having holidays in Mangsir, then what is h: variable or constant?

(i) h is _____.

(ii) What are the values of h?

H = ...

5.



Answer the following questions based on the number line from 1 to 10.

(a) x denotes numbers 5 or greater than 5.

(i) What is x: Constant or variable? x is _____.

(ii) What are the values of x? x = _____.

(b) y denotes numbers less than 6.

(i) What is y: Constant or variable? y is _____.

(ii) What are the values of y? y = _____.

(c) z denotes number 7.

(i) What is z: Constant or variable? z is _____.

(ii) What is the value of z? z = _____.

(d) p denotes numbers between 5 and 7.

(i) What is p: Constant or variable? p is _____.

(ii) What is the value of p? p = _____.

6. Write the following statement in mathematical form. Find the unknown value.

(i) When 5 is added to x, it is 12. What is the value of x?

(ii) When 6 is subtracted from y, it is 3. What is the value of y?

(iii) When 2 is added to 3 times of x it is 14. What is the value of x?

(iv) When 3 is subtracted from 4 times y it is 7. What is the value of y?

Mixed Exercise

1. Circle (O) the correct answer.

(i) If $\square + 3 = 8$, what is the value of $\square$?

(a) 11 (b) 5 (c) 24 (d) $\frac{8}{3}$

(ii) If $\square + 9 = 20$, what is the value of $\square$?

(a) 11 (b) 29 (c) 180 (d) $\frac{20}{9}$

(iii) If $\square - 9 = 5$, then what is the value of $\square$?

(a) 14 (b) $\frac{5}{9}$ (c) 4 (d) 45

(iv) If $\square - 3 = 12$, what is the value of $\square$?

(a) 9 (b) 4 (c) 36 (d) 15

(v) If $\square \div 7 = 7$, what is the value of $\square$?

(a) 49 (b) 7 (c) 1 (d) 0

(vi) If $9 \times 8 = \square$, then which one of the following is the value of $\square$?

(a) 1 (b) 17 (c) 72 (d) 98

(vii) If $45 \div a = 9$, what is the value of a?

(a) 45 (b) 36 (c) 9 (d) 5

(viii) If $c \times 8 = 24$, what is the value of c?

(a) 24 (b) 16 (c) 8 (d) 3

(ix) In which condition, a is a variable?

(a) a denotes 15th of Poush.

(b) a denotes date having Saturday.

(c) a denotes the first date of the month.

(d) a denotes the last date of the month.

(x) In which one of the following conditions, m is constant?

(a) m denotes the name of English months.

(b) m denotes the Mondays of 2020.

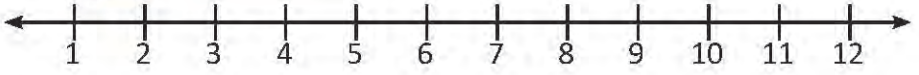
(c) m denotes English month starts from m.

(d) m denotes the Constitution Day of 2020.

2. Find the correct value of a letter or symbol in the following cases.

(i)	(a)	$a + 3 = 11$	(b)	$b + 12 = 25$	(c)	$c + 10 = 18$
	(d)	$10 + a = 14$	(e)	$5 + b = 12$	(f)	$c + 7 = 8$
(ii)	(a)	$a - 5 = 2$	(b)	$b - 8 = 7$	(c)	$c - 12 = 13$
	(d)	$15 - a = 7$	(e)	$18 - b = 6$	(f)	$17 - c = 8$
(iii)	(a)	$\square + 5 = 8$	(b)	$\square + 16 = 21$	(c)	$17 + \square = 23$
	(d)	$8 - \square = 3$	(e)	$15 - \square = 7$	(f)	$\square - 12 = 6$
(iv)	(a)	$a \times 5 = 20$	(b)	$b \times 6 = 30$	(c)	$c \times 4 = 32$
	(d)	$4 \times a = 24$	(e)	$7 \times b = 21$	(f)	$\square \times c = 36$
(v)	(a)	$20 \div a = 4$	(b)	$30 \div 5 = b$	(c)	$32 \div c = 8$
	(d)	$a \div 4 = 6$	(e)	$b \div 6 = 7$	(f)	$\square \div 12 = 3$
(vi)	(a)	$a + a = 12$	(b)	$2b - b = 16$	(c)	$c + c = 18$
	(d)	$2c + c = 15$	(e)	$5a - 3a = 8$	(f)	$4b - 2b = 4$

3. Answer the following questions based on the given number line.



(a) If the value of x is 8 or less than 8,

(i) what are the values of x?

(ii) Is x constant or a variable?

(b) If y is an even number,
(i) what are the values of y?
(ii) Is y a constant or a variable?

4. 30 students got 3 bananas each as a snack.

(i) Write in mathematical form by using box notation.

(ii) Find the total number of bananas distributed.

(iii) If Rs. 8 is the cost of a banana, what is the total cost of the bananas?

(iv) If Rs. 80 was returned from the shopkeeper, how much was given to the shopkeeper? Find by using box notation.

5. When 85 notebooks were distributed equally to all students of class 4 and each got 5 notebooks.

(i) Use box notation to find the total number of students in class 4.

(ii) If the cost of a notebook is Rs. 20, find the total cost by using the box notation.