

MATHS MAGIC

Class - IV

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Foreword

The Government of Andhra Pradesh has unleashed a new era in school education by introducing extensive curricular reforms from the academic year 2020-21. The Government has taken up curricular reforms intending to enhance the learning outcomes of the children with focus on building solid foundational learning and to build up an environment conducive for an effective teaching-learning process. To achieve this objective, special care has been taken in designing the textbooks to achieve global standards.

As a part of the curricular reform, in order to support the designing of textbooks, with better pedagogical strategies, handbooks are given to teachers with elaborate lesson plans. For the practice of the students, workbooks are given which will reinforce the learning in the classroom. Parental handbooks are prepared to impart awareness regarding the teaching-learning process to the parent community. The textbooks are also designed in such a way that the initial two months will focus on the school readiness of the children in order to create a learning environment in the school at the start of the academic year.

In this textbook, concepts are introduced through activities related to daily life incidents, situations, contexts and conversations. To strengthen these concepts, whole class activity, group activity and individual activities are designed. The lessons incorporated are also suitable for multigrade teaching. For additional information on the concepts, QR codes are incorporated in each chapter to enable learning outside the classroom. Care has been taken to ensure that the new textbook is calibrated with the learning requirement of the 21st century.

We are grateful to Honourable Chief Minister Sri. Y.S. Jagan Mohan Reddy for being our source of inspiration to carry out this extensive reform in the education department. We extend our gratitude to Dr. Adimulapu Suresh, Honourable Minister of Education for striving towards qualitative education. Our special thanks to Sri. Budithi Rajsekhar, IAS, Principal secretary, School Education, Sri. Vadrevu Chinaveerabhadrudu, IAS, Commissioner, School Education, Ms. Vetriselvi.K, IAS, Special Officer for their constant motivation and guidance.

We convey our thanks to the expert team who studied curriculum from Chicago to Singapore and recommended best practices across the globe to reach global standards. Our sincere thanks to SCERT of Kerala, Tamilnadu, Karnataka and Haryana in designing the textbooks. We also thank our textbook writers, editors, artists and layout designers for their contribution in the development of this textbook. We invite constructive feedback from the teachers and parents in the further refinement of the textbook.

Dr. B. Pratap Reddy
Director
SCERT – Andhra Pradesh

Instructions to Teachers

- ☞ The new text books designed for class 1 to 5 are in accordance with the recommendations of NCF – 2005, RTE – 2009, APSCF – 2011 and NEP – 2019 Draft.
- ☞ Use the face sheet placed at the beginning of every lesson as the basis for interacting with the children to encourage, speak and motivate them to listen. Prepare and organize some more activities similar to the activities given in the text book for every concept.
- ☞ The lessons are designed based on the classwise expected learning outcomes and the concepts like number system, measurement, geometry, data handling etc are arranged in a spiral approach.
- ☞ The text book contains three important components under headings like – Do these, Try these and Exercise. The questions under the component ‘Do these’, will be direct and simple and ‘Try these’ are difficult. Similarly the ‘Exercise’ component contains mixed questionnaire of 2 or 3 concepts.
- ☞ The teacher should read and understand every concept in the text book before going for teaching. Also they should conduct the individual, group and whole class activities in the class room. Teacher should use the hand book designed for this purpose.
- ☞ Teacher should prepare and use teaching learning material related to the activities of the text book by using available resources, to make the children understand the concepts.
- ☞ Teacher should provide required practice activities to teach children different concepts keeping in mind the academic standards of the subject.
- ☞ Work book is also provided along with the textbook. The 90 minutes duration of a period should be divided for the practice of the children as follows,
 - ◆ 45 minutes for practising the concepts of text book.
 - ◆ 45 minutes for practising the sums of work book.
- ☞ New text book is designed with exercises and activities. So, in such a way that the pupil will be able to understand the concept of Number system, Fractions, Geometry, Multiples and factors, Measurements and Time. The first chapter, Let’s Recall and practice the previous classes concepts. Hence special care should be taken, while teaching this chapter. In this process locally available objects like pebbles, seeds, sticks, beads etc must be used.

Our National Anthem

- Rabindranath Tagore

Jana-gana-mana-adhinayaka jaya he

Bharata-bhagya-vidhata

Panjaba-Sindhu-Gujarata-Maratha

Dravida-Utkala-Banga

Vindhya-Himachala-Yamuna-Ganga

uchchala-jaladhi-taranga

Tava Subha name jage, tave subha asisa mage,

gahe tava jaya-gatha.

Jana-gana-mangala-dayaka jaya he

Bharata-bhagya-vidhata.

Jaya he, Jaya he, Jaya he,

jaya jaya jaya jaya he.

Pledge

- Pydimarri Venkata Subba Rao

India is my country. All Indians are my brothers and sisters.

I love my country and I am proud of its rich and varied heritage.

I shall always strive to be worthy of it.

I shall give my parents, teachers and all elders respect,
and treat everyone with courtesy. I shall be kind to animals.

To my country and my people, I pledge my devotion.

In their well-being and prosperity alone lies my happiness.

Maths Magic

Class - IV

S. No.	Unit	Month	Page No
1.	Lets Recall	June, July	1 - 13
2.	Large Numbers	August	14 - 29
3.	Addition	September	30 - 41
4.	Subtraction	October	42 - 57
5.	Multiplication	November	58 - 70
6.	Division	December	71 - 83
7.	Geometry	December	84 - 102
8.	Data Handling	January	103 - 114
9.	Fractions	January	115 - 132
10.	Measurements	February	133 - 162
	Revision	March	
	Revision	April	



Teacher Corner



Student Corner

Academic Standards

*Academic standards are clear statements about what students must know and be able to do.
The following are the specifications on the basis of which we lay down academic standards*

Problem Solving

- Using concepts and procedures to solve mathematical problems

Stages of problem solving

- Reads problems
- Identifies all pieces of information
- Separates relevant pieces of information
- Understanding what concept is involved
- Selection of procedure
- Solving the problem

Reasoning and Proof

- Reasoning between various steps
- Understanding and making mathematical generalizations and conjectures
- Understanding and justifying procedures
- Examining logical arguments
- Understanding the notion of proof
- Using inductive and deductive logic
- Testing mathematical conjectures

Communication

- Writing and reading mathematical expressions
- Creating mathematical expressions
- Explaining mathematical ideas in his/her own words
- Explaining mathematical procedure
- Explaining mathematical logic

Connections

- Connecting concepts within a mathematical domain
- Making connections with daily life
- Connecting mathematics to different subjects
- Connecting concepts of different mathematical domains
- Connecting concepts to multiple procedures

Visualization and representation

- Interprets and reads data in tables, number line, pictograph, bar graph, 2D figures, 3D figures, pictures
- Making tables, number line, pictograph, bar graph, pictures

Chapter

LET'S RECALL

1

Harshita is at a toy shop with her grandmother Nagamma. The price tags were attached to them. She is reading the price marked on them. You also observe picture and answer the questions given below.



Now answer the following questions.

1. Have you ever been to a toy shop?
2. What did you see in the toy shop?
3. How many toy cars are there?
4. How many soft toys are there?
5. What is the cost of the white teddy?
6. What is the cost of the yellow car?



After purchasing some toys for her grand daughter, Nagamma went to work with her group members. Nagamma was the leader of the agriculture workers in the village. Everyday she goes to the field to work with 8 men, 10 women and distributes the daily wages



In a particular week they worked for 5 days and received the amount.

Daily wage for a man and a woman is same but the leader gets ₹75 more than the others.

Daily wage for each worker is ₹150.

Now observe the following.

Number of days worked	= 5
Number of men worked	= 8
Number of women worked	= 10
Total no. of workers in the group	= $8 + 10 = 18$

$$\text{Daily wage for the leader} = ₹ 150 + 75 = 225$$

$$\text{Daily wage for each worker} = ₹ 150$$



In the evening they started counting the money earned in the following manner.

Money	Expanded form	Short form
225	$200 + 20 + 5$	225
150	$100 + 50 + 0$	150



Exercise-1.0

- Write the number names for the following.
 - 8
 - 20
 - 35
 - 46
 - 100
 - 101
 - 150
 - 200
 - 375
 - 425
 - 802
 - 892
 - 956
- Write the numerals for the number names given.
 - six = _____
 - eighteen = _____
 - fifty two = _____
 - seventy five = _____
 - Four hundred and seventy = _____
 - Six hundred and four = _____
 - Eight hundred and one = _____
 - Two hundred and twenty two = _____
- Write the place and place value of the underlined digits of the given numbers

Serial number	Number	Place	Place Value
1	7 <u>8</u> 4		
2	<u>3</u> 05		
3	69 <u>3</u>		



- Write the expanded form of the following.
 - 56
 - 62
 - 83
 - 87
 - 95
 - 110
 - 175
 - 325
 - 1450
 - 3752
 - 5927

- Write the short form of the following.
 - $20 + 5 =$ _____
 - $40 + 7 =$ _____
 - $80 + 2 =$ _____
 - $300 + 20 =$ _____
 - $600 + 40 + 8 =$ _____
 - $900 + 90 + 9 =$ _____
 - $3000 + 400 + 20 + 5 =$ _____
 - $5000 + 20 + 7 =$ _____

Now, the farmer called Nagamma to work with three women and four men. After working for two days, the farmer gave ₹ 225 to Nagamma, ₹ 150 each per day to other workers as wages and ₹ 75 for auto charges. Then she added the amount she received like this....

Wage for Nagamma for two days	$= 225 + 225 = ₹ 450$
Wage for three women per day	$= 150 + 150 + 150 = ₹ 450$
Wage for women for two days	$= 450 + 450 = ₹ 900$
Wage for four men per day	$= 150 + 150 + 150 + 150 = ₹ 600$
Wage for men for two days	$= 600 + 600 = ₹ 1200$
Auto charges for two days	$= 75 + 75 = ₹ 150$
Total amount	$= 450 + 900 + 1200 + 150 = ₹ 2700$



Exercise - 1.1

1. Add the following.

a) $\begin{array}{r} 4 \\ + 3 \\ \hline \end{array}$	b) $\begin{array}{r} 22 \\ + 63 \\ \hline \end{array}$	c) $\begin{array}{r} 356 \\ + 47 \\ \hline \end{array}$	d) $\begin{array}{r} 845 \\ + 328 \\ \hline \end{array}$	e) $\begin{array}{r} 284 \\ + 328 \\ \hline \end{array}$	f) $\begin{array}{r} 865 \\ + 342 \\ \hline \end{array}$
--	--	---	--	--	--

2. Do the following additions.

a) $\begin{array}{r} 4 \\ 6 \\ + 9 \\ \hline \end{array}$	b) $\begin{array}{r} 28 \\ 49 \\ + 38 \\ \hline \end{array}$	c) $\begin{array}{r} 289 \\ 93 \\ + 26 \\ \hline \end{array}$	d) $\begin{array}{r} 428 \\ 47 \\ + 52 \\ \hline \end{array}$	e) $\begin{array}{r} 509 \\ 254 \\ + 668 \\ \hline \end{array}$	f) $\begin{array}{r} 325 \\ 947 \\ + 526 \\ \hline \end{array}$
---	--	---	---	---	---

3. Write the correct number in the given blanks.

a) $526 + 326 + 94 =$ _____
 b) $829 + 408 = 408 +$ _____.
 c) _____ + 396 = 396.

4. Round off the following numbers to the nearest 10s

a) 56 b) 79 c) 42 d) 91 e) 28

5. Round off the following numbers to the nearest 100s

a) 235 b) 374 c) 929 d) 562 e) 810

6. In a garden, there are 235 mango trees, 652 guava trees and 120 coconut trees. How many trees are there in the garden altogether?



7. In a school, the number of girls is 92 more than the number of boys. If the number of girls is 358, what is the total number of children in the school?

Try this:

Write the correct number in the given blanks.

a) $5 + 3 = 3 + \underline{\quad}$ b) $82 + 40 = \underline{\quad} + 82$ c) $\underline{\quad} + 596 = 596$

Nagamma paid ₹ 150 to the auto driver and counted the rest of the money with her as follows.

Now think of workers in the group. Men or Women? Who gets more income? Leader or the worker?

Number of men workers = 4

Number of women workers = 3

Difference in number of workers = $4 - 3 = 1$

$$\begin{array}{r} 4 \\ -3 \\ \hline 1 \end{array}$$

or

Who gets more income? leader? or the worker?

And by how much?

Leader's income per day = ₹ 225

Worker's income per day = ₹ 150

So, leader gets more income. By how much?

$\text{Difference} = 225 - 150 \quad (\text{or})$

$$\begin{array}{r} 225 \\ -150 \\ \hline 75 \end{array}$$

Total money she had = ₹ 2700

Auto charges = ₹ - 150

Balance with Nagamma = ₹ 2550



Exercise - 1.2

1. Do the following subtractions.

a) $\begin{array}{r} 6 \\ - 2 \\ \hline \end{array}$

b) $\begin{array}{r} 8 \\ - 3 \\ \hline \end{array}$

c) $\begin{array}{r} 35 \\ - 15 \\ \hline \end{array}$

d) $\begin{array}{r} 56 \\ - 27 \\ \hline \end{array}$

$$\begin{array}{r} \text{e) } 57 \\ - 38 \\ \hline \end{array}$$

$$\begin{array}{r} \text{f) } 457 \\ - 228 \\ \hline \end{array}$$

$$\begin{array}{r} \text{g) } 960 \\ - 456 \\ \hline \end{array}$$

$$\begin{array}{r} \text{h) } 835 \\ - 346 \\ \hline \end{array}$$

2. Subtract

a) 59 from 62

b) 86 from 92

c) 192 from 536

d) 485 from 928

3. Find the difference of 205 and 62.

4. What must be subtracted from 653 to get 268?

5. What must be added to 246 to get 859?

6. The sum of two numbers is 453. If one number is 285, then what is the other number?

7. The difference of two numbers is 568. If one number is 796, then what is the other number?

On the other day Nagamma went to Rajaiah's field for plantation work along with 5 men and 6 women workers. They worked for four days. Rajaiah had to pay ₹ 150 to each worker as wage. He wanted his grandson to calculate the total amount he needed to pay. His grandson did as follows:

Number of men workers = 5

Number of days they worked = 4
= $5 \times 4 = 20$

Number of women workers = 6

Number of days they worked = 4
= $6 \times 4 = 24$

Total workers per day = $5 + 6 = 11$

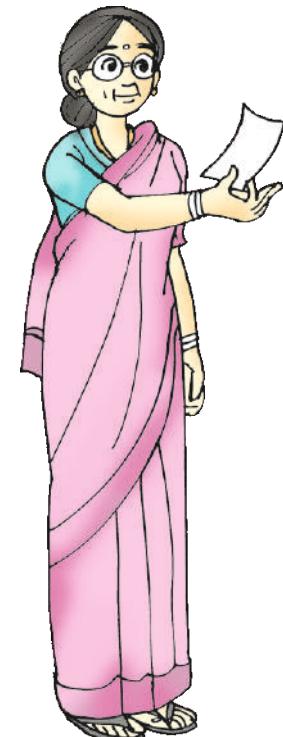
Number of days they worked = 4
= $11 \times 4 = 44$

Daily wage for men per day = 150×5
$$\begin{array}{r} 150 \\ \times 5 \\ \hline 750 \end{array}$$

= 750 (or)
$$\begin{array}{r} 150 \\ \times 6 \\ \hline 900 \end{array}$$

Daily wage for women per day = $150 \times 6 = 900$ (or)

So the total amount = $900 + 750 = ₹ 1650$



Exercise - 1.3

1. Do the following multiplications.

a) 5	b) 15	c) 27	d) 87	e) 89	f) 96	g) 754
x 3	x 4	x 6	x 25	x 1	x 9	x 10
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

2. Find the product of the following.

a) $395 \times 7 =$ _____	b) $402 \times 9 =$ _____	c) $534 \times 4 =$ _____
d) $826 \times 5 =$ _____	e) $498 \times 0 =$ _____	f) $0 \times 35 =$ _____

3. Cost of a pen is ₹ 25. What is the cost of 9 such pens?

4. One basket of mangoes weighs 36 kg. What is the weight of 10 such baskets of mangoes?

5. A rice bag weighs 24 kg. What is the total weight of 478 bags of rice?

6. The product of a number and 5 is zero. Find the number.

One day Nagamma along with 5 workers went to Rajaiah's field in two autos. They seated equally in two autos. She received ₹ 975 from Rajaiah. Auto charges ₹ 90 were to be borne by Rajaiah. She distributed the amount to the workers as given below.

Number of workers including Nagamma = $5 + 1 = 6$

Number of persons seated in each auto = $6 \div 2 = 3$

$$\begin{array}{r} 2) \ 6 \ (3 \\ - 6 \\ \hline 0 \end{array}$$



Total amount received from Rajaiah = ₹ 975

Wage for Nagamma per day = ₹ 225

Total wages for remaining 5 workers = $975 - 225 = 750$

$$\begin{aligned} \text{Wage for each worker per day} &= 750 \div 5 \\ &= ₹ 150 \end{aligned}$$

dividend	
divisor	5) 750 (150 quotient
-5	
—————	
25	
- 25	
—————	
00	
- 00	
—————	
0	→ remainder
—————	

Final amount received by each worker = $150 - 15 = ₹ 135$



Exercise - 1.4

1. Do the following divisions.

- | | | | | |
|---|---------------------|-----------------|-----------------|--|
| a) $6 \div 2$ | b) $8 \div 4$ | c) $9 \div 3$ | d) $24 \div 6$ | |
| e) $45 \div 3$ | f) $96 \div 4$ | g) $224 \div 7$ | h) $845 \div 8$ | |
| 2. a) $40 \div 4 = ?$ | b) $60 \div 10 = ?$ | | | |
| 3. How many 9's are there in 90? | | | | |
| 4. Find the quotients in each of the following divisions. | | | | |
| a) $69 \div 3$ | b) $76 \div 4$ | c) $96 \div 2$ | d) $846 \div 3$ | |
| e) $925 \div 5$ | | | | |
| 5. Complete the following table: | | | | |



S. No.	Division	Dividend	Divisor	Quotient	Remainder
1	$9 \div 4$				
2	$64 \div 5$				
3	$67 \div 7$				
4	$73 \div 9$				

- From a ribbon of length 57cm, how many pieces of ribbon, 3cm long each can be cut?
- Aman gives 12 chocolates to 4 children equally. How many chocolates does each child get?
- Find the number of weeks in 91 days.

At the end of the work, Nagamma and her workers collected paddy and cotton in bags. Which weighs more? One bag of paddy? Or one bag of cotton? (bags are of same size)

Exercise - 1.5

1. Circle the object with more weight.

- | | | |
|---------------|------------|-----------|
| a) Pencil | Sharpener | Pen |
| b) Tiffin box | Pencil box | Lunch box |
| c) Rat | Cat | Dog |



2. Arrange the following vehicles in the ascending order of their weights.

- Cycle Bus Motor bike Car

3. Write the correct units of measurement in kgs or grams.

- a) Rice bag b) Eraser c) Books bag

On her way back to home Nagamma visited a cloth store to buy some shirting cloth for her husband. Shopkeeper asked her the length of the cloth she required. 1.20 metres she replied.

Exercise - 1.6

1. Identify which of the following objects are measured in metres and which in centimetres.

- | | |
|---|--------------------------|
| a) length of your classroom black board | b) length of a pencil |
| c) length of a flag pole | d) length of your finger |

2. Arrange the following lengths in descending order.

- a) 8m b) 10cm c) 5m d) 20cm

3. Write any three objects measured in metres and three objects in centimetres.

Now Nagamma is at Milk booth. She purchased 1 litre of milk for her family. The family uses milk for making coffee, tea and curd.

$$1\text{litre} = 1000 \text{ ml}$$

Exercise - 1.7

1. Write any three objects measured in litres



2. Tick the object that has highest capacity.

mug bucket water bottle water tank

3. Give a rough estimate of the following in litres for

- a) drinking water for one person per day b) for bathing
c) for brushing your teeth d) for watering a plant

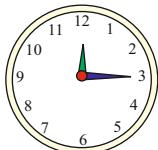
As she stopped at cloth store and milk booth on her way home, Nagamma reached her home one hour late.

$$1 \text{ hour} = 60 \text{ minutes}$$

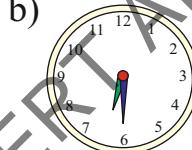
Exercise - 1.8

1. Read the clock and write the time shown by it.

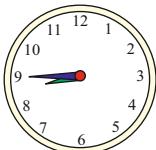
a)



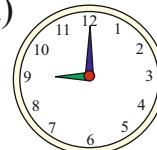
b)



c)



d)



2. Show the following times on clock.

a) 9 : 45

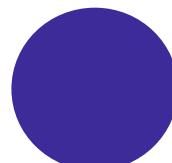
b) 1 : 15

c) 6 : 30

d) 11 : 20

After having dinner, Nagamma and Rajamma, her co-worker were discussing the shape of the field they worked during the day. Rajamma asked "What was the shape of the field?" Nagamma answered "It was in square shape."

Can you identify the following shapes?



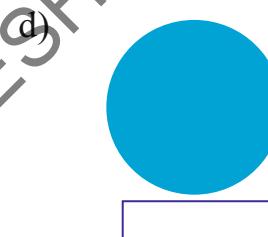
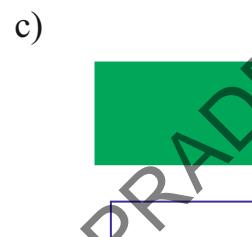
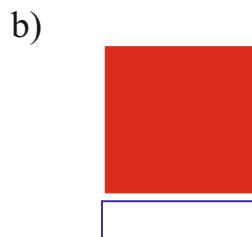
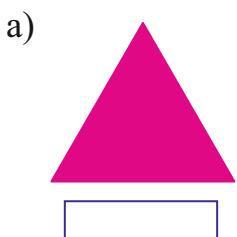
Do this:

Complete the following table.

Serial number	Shape	Number of Vertices	Number of Edges or Sides
1	Triangle		
2	Square		
3	Rectangle		
4	Circle		

Exercise - 1.9

1. Write the names of the following shapes in the boxes provided.



2. Fill the following table.

Serial number	Name of the object	Name of the shape	Number of Corners	Number of Edges
			(Vertices)	(Sides)
1	Match box face	rectangle	3	3
2	Ball			
3	Joker cap			
4	Chalk piece box			

3. Fill the following table.

Serial Number	Shape of the object	Objects in the given shape
1.	Rectangle	
2.	Square	
3.	Circle	
4.	Triangle	

At the end of the week Nagamma counted the amount she saved during the week. She separated the saved money as per denominations.

Rupees	Number of currency notes	Amount
	= 4	₹ 400
	= 3	₹ 150
	= 3	₹ 60
	= 2	₹ 20
Total :		₹ 630

Exercise - 1.10

- Write the tally marks for the following numbers.
 - 4 =
 - 3 =
 - 1 =
 - 2 =
- Write the numbers for the following tally marks.
 - ||| = ____
 - | = ____
 - || = ____
 - |||| = ____
- Complete the following table.

Game	Number of pupils interested	
	Tally marks	Number of boys
Cricket		4
Foot ball		
Star		3
Kho – Kho		
Chess		1

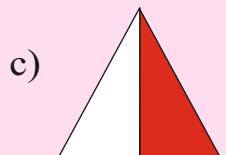
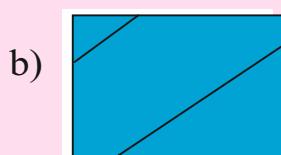
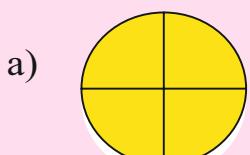


In the evening Nagamma bought a bun and shared it equally between her grandson Siva and grand daughter Harshitha as shown in the adjacent figure.



Do this:

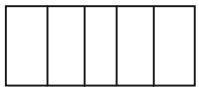
Identify the figures which are divided into equal parts and tick (\checkmark) mark.



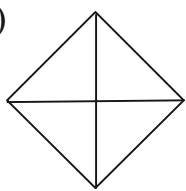
Exercise - 1.11

1. Tick (\checkmark) the figures which are divided into equal parts.

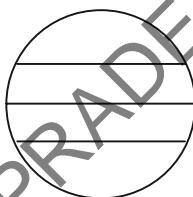
a)



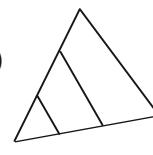
b)



c)

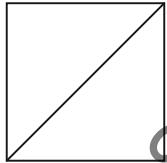


d)

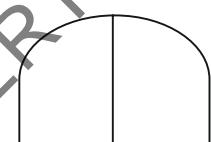


2. Shade half ($\frac{1}{2}$) of each of the following figures.

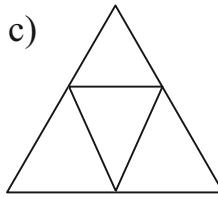
a)



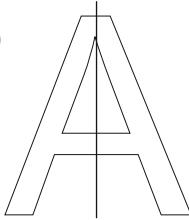
b)



c)

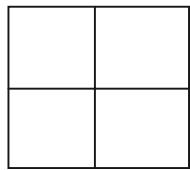


d)

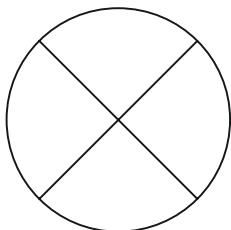


3. Shade one-fourth ($\frac{1}{4}$) of each of the following figures.

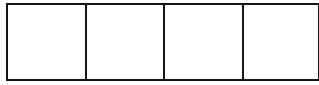
a)



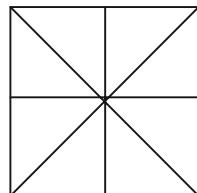
b)



c)



d)



Chapter

Large Numbers

2

2. 0 Introduction

Observe the following pictures. Have you seen people in your village doing these works? They are Potter, Blacksmith, Cobbler, Farmer, Drummer, Washerman, Tailor, Shepherd, Poultry worker and Agriculture labourers. They are our helpers.



Can we do all the above jobs on our own? No, we can't. They help us a lot. Have you ever thought of their daily income/earning? Their monthly income is not fixed. It depends on the work they get.

John wanted to know how much they earn. He met these people and enquired about their monthly income. He noted the information and his findings as follows.

Professions	Daily income in Rupees	Monthly income in Rupees
Potter	325	9,325
Blacksmith	400	8,400
Cobbler	150	4,150
Washer man	275	6,275
Drummer	175	5,175
Tailor	325	9,325
Shepherd	160	4,160
Poultry worker	275	8,275
Agricultural labour	225	8,225

Daily incomes are expressed in 3 - digit numbers. Monthly incomes are expressed as 4 - digit numbers.

Write the above numbers in words in the given blank space.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____



Do this:

Write the income and expenditure details of your family in words.



2.1 Large Numbers

Bharath lives alone in his house. His son sends him ₹ 1000 every month. He makes note of this on a paper. Help him to do so.

For one month I receive ₹1000, one thousand.

For two months I receive ₹ 2000, two thousand.

3 months _____

4 months _____

5 months _____

7 months _____

8 months _____

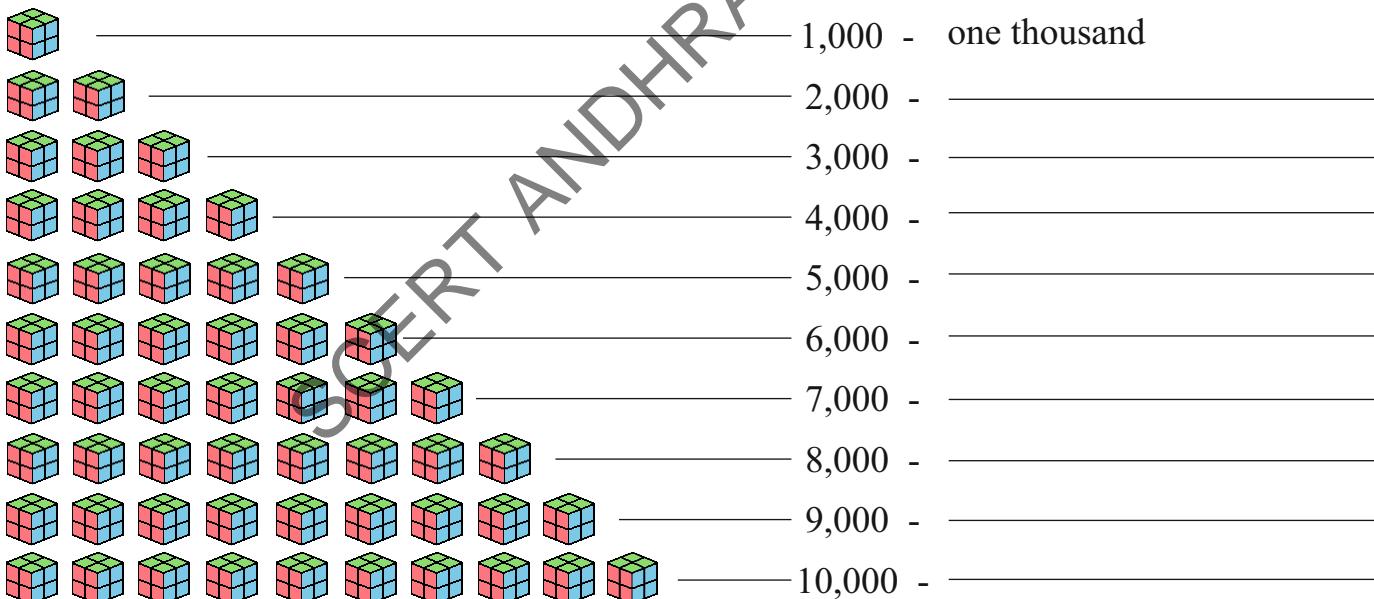
9 months _____



How to write the amount for ten months?

It is ten thousand. This is the smallest 5-digit number and can be written as 10,000.

If one block () represents one thousand (1000) then



Now observe the following:

$$9 + 1 = 10$$

$$10 + 1 = 11$$

$$99 + 1 = 100$$

$$100 + 1 = 101$$

$$999 + 1 = 1000$$

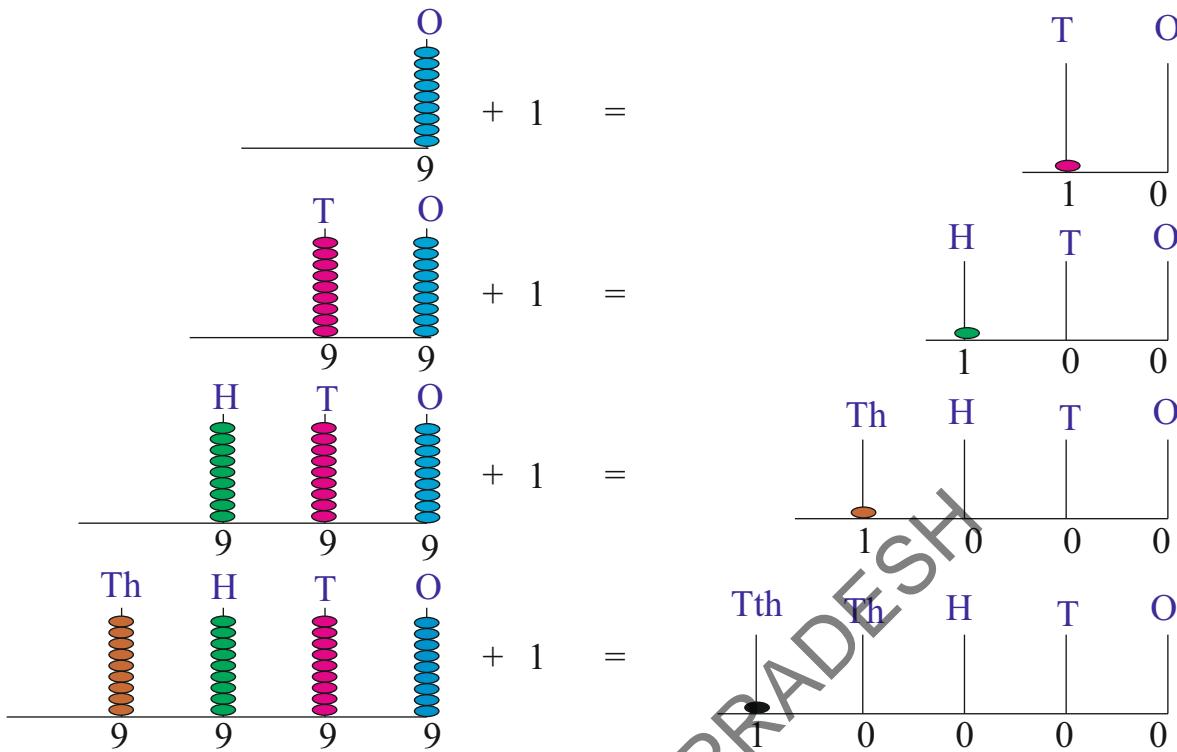
$$1000 + 1 = 1001$$

$$9999 + 1 = 10000$$

$$10000 + 1 = 10001$$



We observe the same patterns on a spike abacus, then it looks like this.



Can you write the next twenty numbers?

$$\begin{array}{c} 10\,000 + 1 \\ \hline 10\,001 \end{array}$$

$$\begin{array}{c} 10\,000 + 2 \\ \hline 10\,003 \end{array}$$

$$\begin{array}{c} 10\,000 + 3 \\ \hline 10\,003 \end{array}$$

$$\begin{array}{c} 10\,000 + 4 \\ \hline 10\,004 \end{array}$$

Ten thousand and one

Ten thousand and two

Ten thousand and three

Ten thousand and four

$$\begin{array}{c} 10\,000 + 5 \\ \hline 10\,005 \end{array}$$

$$\begin{array}{c} \text{ } \\ \hline \text{ } \end{array}$$

Do This

Write the following numerals in words.

a) 10,049

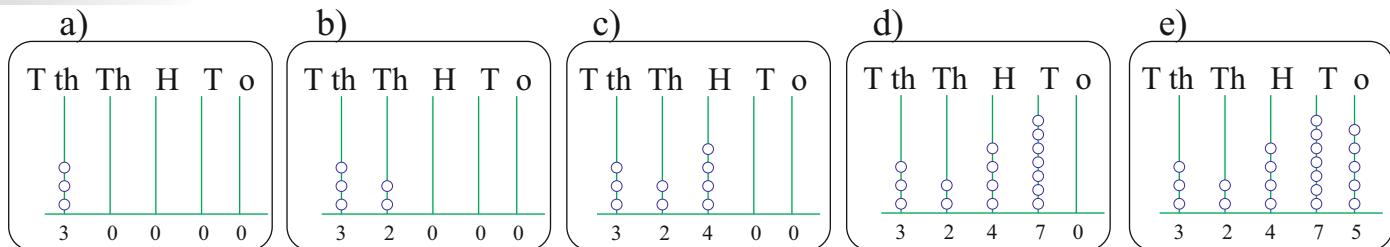
b) 20,000

c) 30,000

d) 40,000

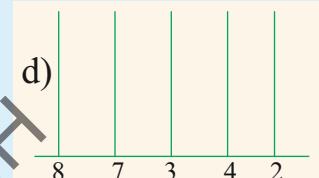
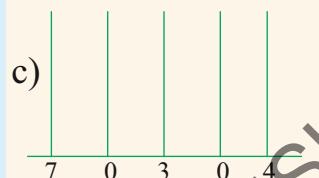
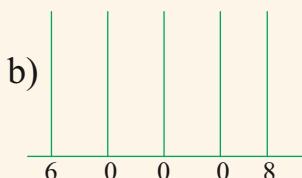
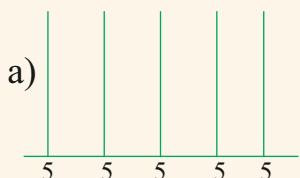
e) 50,000

2.2. Let us represent the numbers on the spike abacus

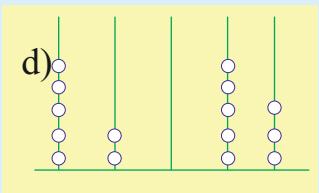
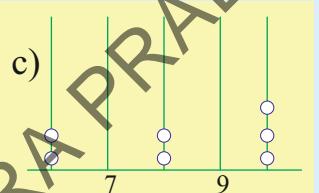
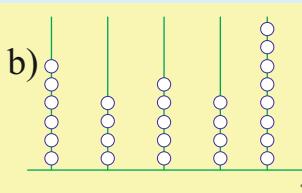
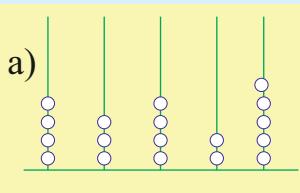


Do this:

1. Represent the given numbers on the spike abacus.



2. Write numbers by reading the beads on the spike abacus.



3. Represent the following numbers on spike abacus.

a) 60060

b) 60600

c) 66000

2.3. Numbers beyond Ten thousand:

Numbers up to 5-digit numbers can be tabulated as follows using place values of the digits.

Number	Place value				
	Ten thousands	Thousands	Hundreds	Tens	ones
3246	-	3	2	4	6
62487	6	2	4	8	7
23809	2	3	8	0	9



Let us observe how to write the numbers according to the place values by putting commas. In our system of numeration, we use ones, tens, hundreds, thousands, ten thousands. The comma comes after hundreds place. (i.e., 3 digits from the right side)and marks thousands. Commas help us in reading and writing large numbers easily.

Complete the following table:

Number	Number by putting commas	Number in words
12635	12,635	Twelve thousand six hundred and thirty five.
23809	23,809	Twenty three thousand eight hundred and nine.
40210	40,210	
74845	74,845	
95026	95,026	

Do this:

1. Write the following numbers in words by putting commas.
 - a) 16372
 - b) 29450
 - c) 86004
2. Write the following numbers in words.
 - a) 32,896
 - b) 46,90
 - c) 92,006

2.4. Face value and place value of a digit in a number.

The face value of a digit in the given number is the value of the digit itself.

In the number **5 8 6 9**
 the face value of 9 is 9
 the face value of 6 is 6
 the face value of 8 is 8
 the face value of 5 is 5



The place value of a digit in a given number :

The place value of a digit in the given number depends on its place.

For example in the numeral 86342

Tth	Th	H	T	O
8	6	3	4	2

2 is in ones place. So, place value of 2 is = 2×1	=	2
4 is in tens place. So, place value of 4 is = 4×10	=	40
3 is in hundreds place. So, place value of 3 is = 3×100	=	300
6 is in thousands place. So, place value of 6 is = 6×1000	=	6000
8 is in ten thousands place. So, place value of 8 is = 8×10000	=	80000

Therefore the value of numeral is 86342 sums up to,

$$80000 + 6000 + 300 + 40 + 2 = 86,342$$

Do you know!

As a digit moves to left its value increases 10 times than its previous place value.

Tth	Th	H	T	O	value of 6
				6	6
			6	5	60
		6	3	8	600
	6	9	5	4	6000
6	3	8	4	7	60000



2.5. Numbers in expanded form:

We can express any number in expanded form using the place values of the digits in the given number as shown below.

Example -1 The expanded form of 7,496

7	4	9	6
Th	H	T	O

$$\begin{aligned} 7496 &= 7 \text{ thousands} + 4 \text{ hundreds} + 9 \text{ tens} + 6 \text{ ones} \\ &= 7 \times 1000 + 4 \times 100 + 9 \times 10 + 6 \times 1 \\ &= 7000 + 400 + 90 + 6 \end{aligned}$$

Example -2 Write the expanded form of 52,374.

$$\begin{aligned} 52374 &= 5 \text{ ten thousands} + 2 \text{ thousands} + 3 \text{ hundreds} + 7 \text{ tens} + 4 \text{ ones} \\ &= 5 \times 10000 + 2 \times 1000 + 3 \times 100 + 7 \times 10 + 4 \times 1 \\ &= 50000 + 2000 + 300 + 70 + 4 \end{aligned}$$

We get their respective short form by adding the addends of expanded form.

Example - 3 Short form of $8000 + 900 + 60 + 2 = 8962$

8	9	6	2
Th	H	T	O

Example - 4 Short form of $90000 + 6000 + 200 + 80 + 3 = 96,283$

9	6	2	8	3
Tth	Th	H	T	O

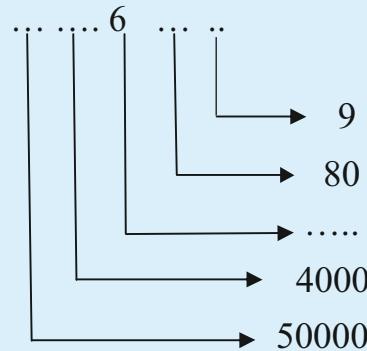
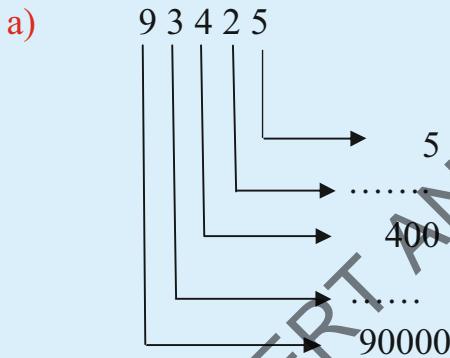


Do this:

1. Write the expanded form of the following numbers.
a) 15,387 b) 42, 609 c) 67,892 d) 98,205
2. Write the short form of the following.
a) $80000 + 6000 + 900 + 20 + 8$ b) $90000 + 20 + 4$

Try this:

- * Write the place values of the given digits and digits for the given place values.



Exercise: 2.1

1. Write the number names of the following.
a) 25,250 b) 41,415 c) 43,721 d) 72,300
2. Write the numeral for the number names.
a) Thirty three thousand eight hundred fifteen.
b) Ninety two thousand eighty five.
3. Write a number that has...
a) 1 ten thousand, 9 thousands, 4 hundreds, 5 tens, 8 ones =
b) 3 ones, 2 tens, 6 hundreds, 7 one thousand, 4 ten thousands =

4. What is the place value of 4 in each of the following numbers. One has been done for you.

a) 95,403 _____ 4 hundreds or 400

b) 4,327.....

c) 84,932.....



5. Fill in the blanks to expand the given numbers.

a) 5,642 = + + +

b) 24,926 = + + + +

c) 6.,3....= + 5000 + + 80 + 2

6. Write the short form of the following.

a) $90000 + 3000 + 400 + 70 + 6$ b) $20000 + 4000 + 0 + 80 + 9$ c) $40000 + 6$

6. Write the following numbers in the place value chart.

a) 3 5 4 2 7

Tth	Th	H	T	O

b) 6 8 4 2 9

Tth	Th	H	T	O

c) 9 7 2 3 4

Tth	Th	H	T	O

2.6 Comparison of numbers:

To compare two numbers we should follow the following rules.

Rule-1 If two numbers have different number of digits, then the number with lesser digits is less than the other number, the number with more digits is greater than the other number.

Example -5 8,694 < 24,365 or 24,365 > 8,694

4 digit number < 5 digit number

5 digit number > 4 digit number

Rule-2 If two numbers have the same number of digits , then the left most digits of the numerals are to be compared. The numeral having greater left most digit is bigger and the lesser left most digit is smaller.

Example -6 62,425 < 76,392 ($6 < 7$ in ten thousands place)

also 76,392 > 62,425 ($7 > 6$ in ten thousands place)

Rule -3 If the left most digits of the numerals having the same number of digits are also same, then the second left most digits are to be compared. This rule is to be followed till the units place of the numerals.

Example -7

$$3\cancel{4}251 < 3\cancel{6}879$$

(4 < 6 in thousands place)

$$59\cancel{3}68 < 59\cancel{4}75$$

(4 > 3 in hundreds place)

$$235\cancel{7}2 < 235\cancel{8}9$$

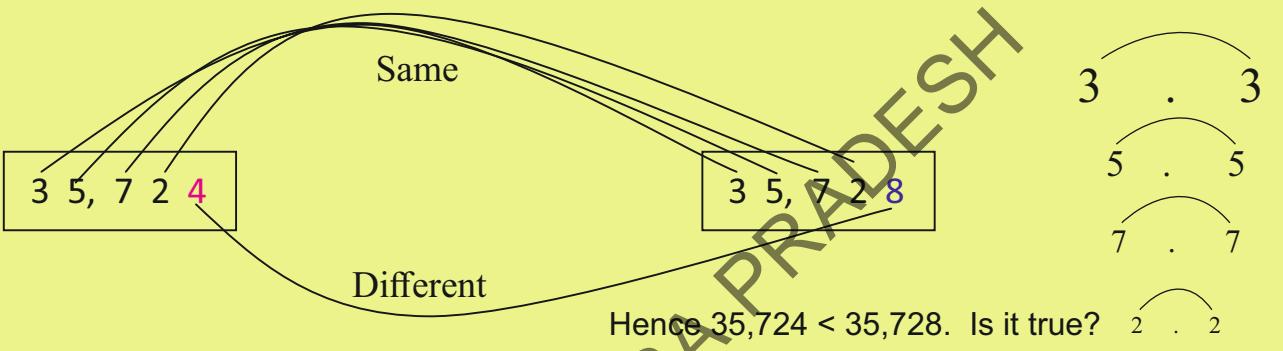
(7 < 8 in tens place)

$$9568\cancel{3} < 9568\cancel{7}$$

(7 > 3 in ones place)



Think and discuss

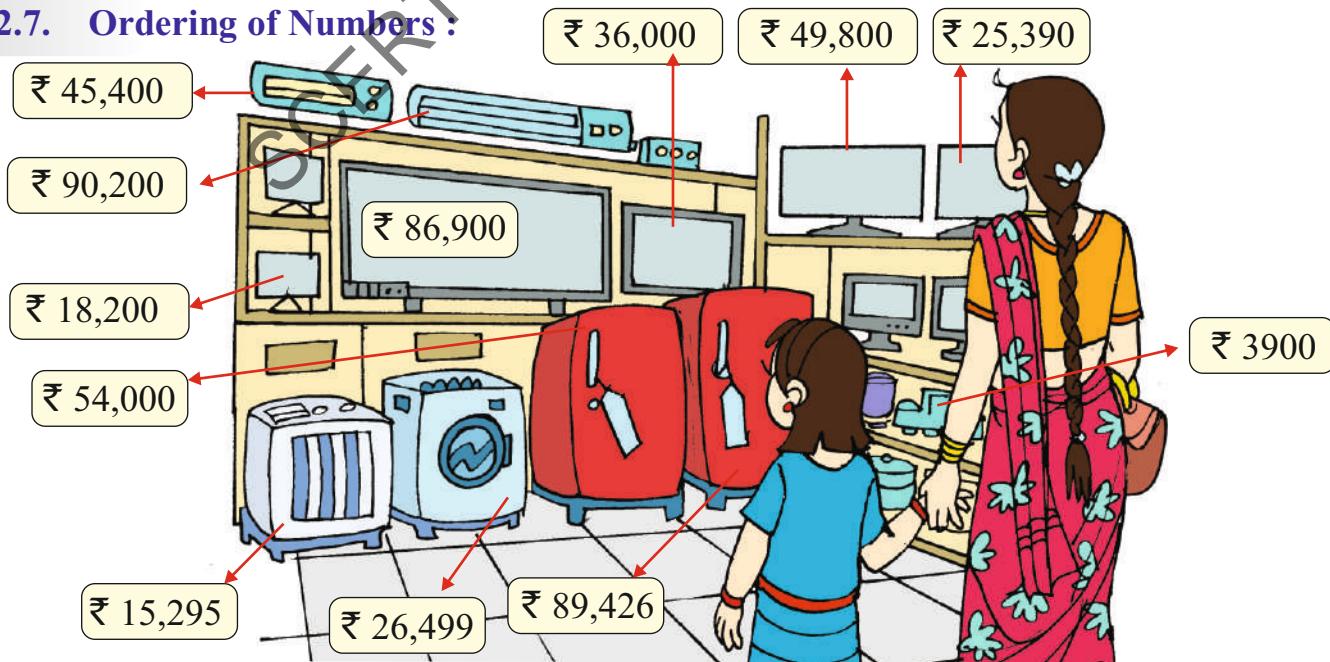


Do this:

Put the correct symbol $<$, $>$ or $=$ in the boxes given below.

- a) $52,927 \square 64,327$ b) $43,004 \square 42,004$ c) $72,549 \square 72549$

2.7. Ordering of Numbers :



Ascending and descending order of numbers

The prices of five items in a shop are

₹ 15,295; ₹ 26,499; ₹ 89,426; ₹ 3,900; ₹ 54,000

Let us arrange the numbers from the smallest to the largest of the given.

Then ₹ 3900, ₹ 15295, ₹ 26499, ₹ 54000, ₹ 89426

The arrangement of numbers in the order of the smallest to the largest is known as ascending order of the numbers.

The costs of five TVs of different brands are ₹ 25,390; ₹ 36,000; ₹ 49,800; ₹ 18,200; ₹ 86,900. Let us arrange these prices from the largest to the smallest.

₹ 66900, ₹ 49800, ₹ 36000, ₹ 25390, ₹ 18200

The arrangement of numbers in the order of the largest to the smallest is known as descending order of the numbers.

Do this:

* Arrange the following numbers in ascending and descending order.

- a) 16256, 20380, 96465, 30856, 56492 b) 27438, 5682, 38648, 97294, 56642

Do you know !

The greatest 1-digit number is 9
The greatest 2-digit number is 99
The greatest 3-digit number is 999
The greatest 4-digit number is 9999
The greatest 5-digit number is 99999



2.8. Forming numbers

Forming of numbers by using different digits

4 3 2 9 6

Arrange these digits in descending order to form a 5-digit number 9 6 4 3 2

Can you write a number greater than this number using the same digits?

No, so to form the greatest number we arrange these digits in descending order.

Then we get 9 6 4 3 2

Therefore the greatest number is 96,432

Arrange these digits in ascending order to form a 5-digit number 2, 3, 4, 6, 9.

Can you write a number less than this using the same digits?

No, so to form the smallest number, we arrange these digits in ascending order.

Then we get 2 3 4 6 9

Therefore the smallest number is 23,469.

Example - 8

Write the greatest and the smallest 5-digit number using the digits 9, 0, 5, 2, 3.

To form the greatest 5-digit number arrange the digits in the decreasing order that is 9, 5, 3, 2, 0.

Therefore, the greatest number is 95,320.

To form the smallest 5-digit number arrange the digits in the increasing order. If one of the given digits is '0', then we write the smallest digit other than zero in the highest place.

We write 0 next to it. Write the rest of the digits in ascending order.

Therefore the smallest number is 20,359.

Do this:

By using the given digits write the greatest and the smallest number without repetition of any digit.

Serial number	Digits	Greatest number	Smallest number
1.	7,2,8,3,9		
2.	3,7,0,4,6		
3.	2,9,5,9,4		

2.9. Let us learn how to form different numerals with the given digits. (without repeating the digits)

Example - 9 Write all the possible 2-digit numbers with 6, 8.

Solution: They are 68 and 86

Example - 10 Write all the possible 3-digit numbers with the digits 2, 6, 9.

Solution: 269 629 926 296 692 962

They are 269 296 629 692 926 962.

Greatest number : 962 (digits are arranged in descending order.)

Smallest number : 269 (digits are arranged in ascending order.)

Do this:

- Write all the possible 2-digit numbers formed by the digits with 5 and 4.
- Write all the possible 3-digit numbers formed by the digits with 4, 7 and 2.



Try this:

Write all the possible 4-digit numbers formed by the digits 2,4,8,1. How many are there?

2.10 Predecessor and Successor

To get the very next number of a given number we add 1 to that number. This number is called **successor** of the given number. In other words, the number that comes immediately after a number is its successor.

Successor of 25630 is $25630 + 1 = 25631$

To get the previous or before number we should subtract 1 from the given number. This number is called **predecessor** of the given number. In other words, the number that comes immediately before a number is Predecessor of the given number.

Predecessor of 64351 is $64351 - 1 = 64350$

Do this:

- Write the successor of 24564.
- Write the predecessor of 34323.
- Complete the following table.

Number	Predecessor	Successor
42,356		
38,600		
25,999		

2.11 Applications of numbers in daily life:

Numbers play a pivotal (important) role in our lives. Our life revolves around numbers since the day we were born.

The following are some uses of numbers in our daily life.

- * Switching the channel of favourite TV shows.
- * Weighing of vegetables, fruits and meat in market.
- * Calculating budget for food and other expenses of your family.
- * Calling a friend using a mobile to his number.

DO YOU KNOW !

- * The length of blood vessels of our human body is nearly 97,000 kilometres.
- * The total land border of India is 15,200 kilometres.



Exercise 2.2

1. Circle the smallest number.
 - a) 28828; 82988; 63215; 24321
 - b) 98234; 36707; 64994; 24322
2. Circle the greatest number.
 - a) 80,081; 80,801; 80,180; 80,108
 - b) 34,567; 78,893, 34,765; 78,398
3. Write the predecessor of the given number.
 - a) 46,250 b) 72,579 c) 38,205
4. Write the predecessor and successor for the following numbers.
 - a) 43565 b) 67543 c) 98887 d) 40000
5. Fill in the blanks with “ >, < or = ” .
 - a) 8154 ____ 8514 b) 59260 ____ 59260 c) 97306 ____ 93706
 - d) Thirty seven thousand
five hundred and twenty Thirty seven thousand
six hundred and twenty five

6. Adeyya was elected as the president in a major panchayat election. He got 6,450 votes and Somayya got 5,225 votes. Write the total votes polled?
7. The number of people who visited an exhibition in four days are 1826, 1493, 1630 and 1863 respectively. Arrange these numbers in the ascending order.
8. In a public distribution shop, a dealer received 2,893 bags of rice in a month. He distributed 2,936 bags of rice to the white card holders. Is it possible?
9. The income of a cinema theater during four shows is as follows:

Noon Show	Matinee	First Show	Second Show
₹ 36,750	₹ 54,290	₹ 48,540	₹ 29,370

- a) Arrange the above incomes in ascending order and in descending order.
- b) Which show has more income?
- c) Which show has less income?
10. Aditya purchased a car for ₹ 75,000 and sold it at ₹ 82,000. Does he gain or lose?
11. The hall ticket number of Swathi, who is appearing for Jawahar Navodaya Vidyalaya Entrance Exam is 42,384. Can you guess the hall ticket numbers of students sitting back and in front of her?
12. Complete the following number series.
- a) 18100, 19100, 20100 _____, _____, _____.
- b) 17250, 17275, 17300 _____, _____, _____.
- c) 99999, 89999, 79999 _____, _____, _____.



Palindrome

Project Work:

- * Observe the numbers.

252

131

656



These numbers read forwards and backwards the same!

These numbers are known as “ Palindrome Numbers”

Can you write some more Palindrome Numbers of 3-digit and 4-digit numbers?

- * Do you know one of the methods of writing palindrome numbers using multiplication?

Here it goes

$$1 \times 1 = 1$$

$$11 \times 11 = 121$$

$$111 \times 111 = 12321$$

$$1111 \times 1111 = 1234321$$

Like this, write the next three palindrome numbers.



Riddle:

I am a 4-digit number. The digit in my tens place is 2 times the digit in my ones place.

The digit in the hundreds place is 2 times the digit in the tens place. The digit in the thousands place is 2 times the digit in the hundreds place. Who am I?

Lab Activity:

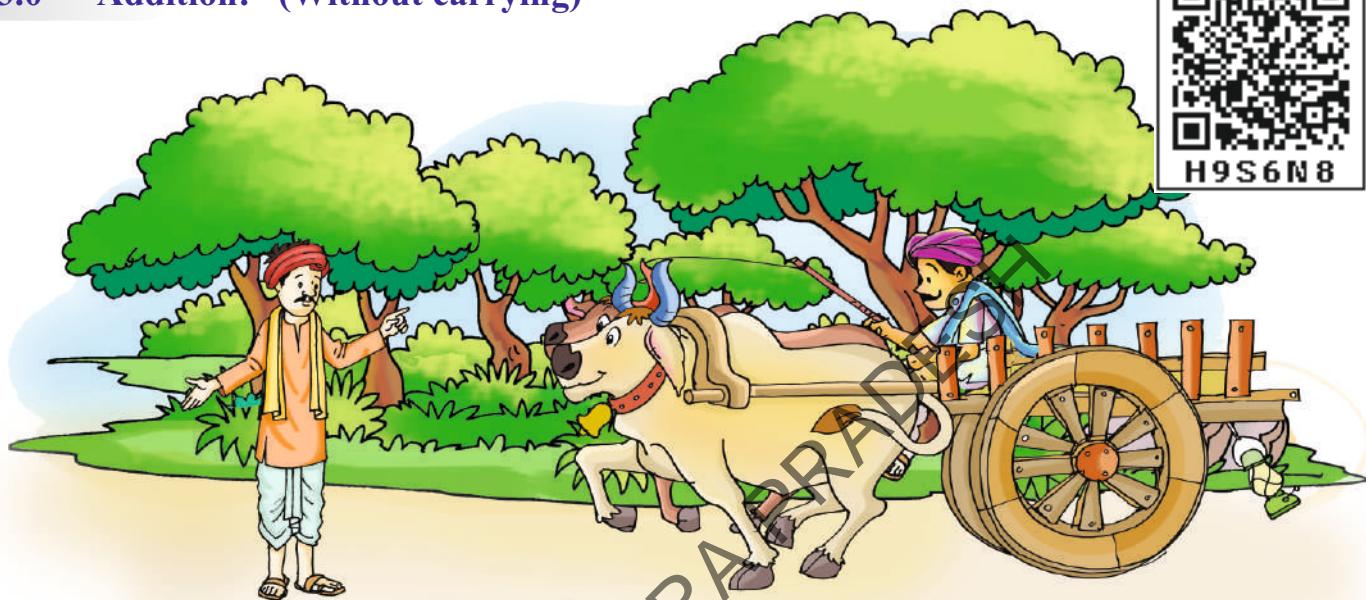
- Divide the class into five groups.
- Give each group a deck of cards from 0 to 9.
- Then ask the children to shuffle the cards and take five cards at random and form a five digit number.
- Ask the children to compare the numbers formed by each group.
- The group that forms the greatest number is the winner.

Chapter

Addition

3

3.0 Addition: (Without carrying)



Ramayya and Venkayya were good friends in Mahasingi. They helped each other in cultivation. One day Ramayya sold tomatoes and potatoes and bought groceries for his home. After purchasing groceries, he went back to home on bullock cart. He met Venkayya on the road.

They had the following conversation.

Venkayya : Hi, Ramayya ! Why are you looking so happy?

Ramayya : I was able to sell all tomatoes and potatoes in the market.

Venkayya : How much did you earn on tomatoes?

Ramayya : ₹ 7145

Venkayya : How much did you earn on potatoes?

Ramayya : ₹ 2513

Children, have you followed the conversation?

Let's find the total amount earned by Ramayya

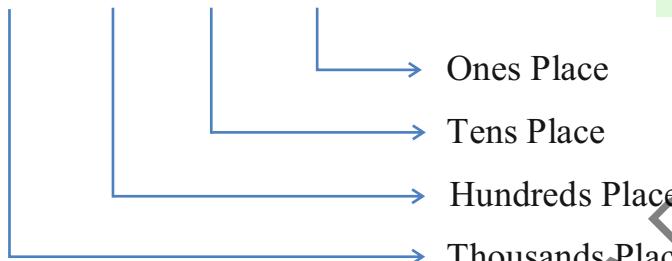
Money earned by Ramayya on Tomatoes = ₹ 7145

Monney earned by Ramayya on Potatoes = (+) ₹ 2513

Total amount earned by Ramayya = ₹ 9658

Process in addition:

Th	H	T	O
7	1	4	5
2	5	1	3
9	6	5	8



Can you add?

$$\begin{array}{r}
 721 \\
 +254 \\
 \hline
 \end{array}
 \quad
 \begin{array}{r}
 3254 \\
 +6243 \\
 \hline
 \end{array}$$

$$\begin{array}{rcl}
 : & 5+3 & = 8 \\
 : & 40+10 & = 50 \\
 & 100+500 & = 600 \\
 : & 7000+2000 & = 9000 \\
 & & \hline
 & & 9658
 \end{array}$$

3.1 Addition : (With carrying)



There is a big library in ZPH School Saravakota. There are 2857 books in Telugu and 1496 books in English in the library.

How many books are available in the library?

To find the total books in the Library, we have to add 2857 and 1496.

	Th	H	T	O
Number of books in Telugu	=	(1)	(1)	(1)
Number of books in English	=	2	8	5
Total number of books available in the Library = (+)		1	4	9
		4	3	6
			5	3

Now we find the sum in another way and observe the process of addition.

$$2857 = 2 \text{ Thousands} + 8 \text{ Hundreds} + 5 \text{ Tens} + 7 \text{ Ones}$$

$$1496 = 1 \text{ Thousand} + 4 \text{ Hundreds} + 9 \text{ Tens} + 6 \text{ Ones}$$

$$\text{Total} = 3 \text{ Thousands} + 12 \text{ Hundreds} + 14 \text{ Tens} + 13 \text{ Ones}$$

$$= 3 \text{ Thousands} + (10+2) \text{ Hundreds} + (10+4) \text{ Tens} + (10+3) \text{ Ones}$$

$$= (3+1) \text{ Thousands} + (2+1) \text{ Hundreds} + (4+1) \text{ Tens} + 3 \text{ Ones}$$

$$= 4 \text{ Thousands} + 3 \text{ Hundreds} + 5 \text{ Tens} + 3 \text{ ones}$$

$$= 4000 + 300 + 50 + 3$$

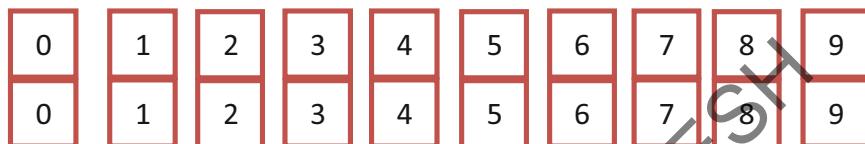
$$= 4353$$

Example -1 In the same way, we add 8956 and 6487.

Tth	Th	H	T	O
(1)	(1)	(1)	()	
8	9	5	6	
(+)	6	4	8	7
	1	5	4	4
			3	



Addition Game: Play and Win



- ❖ Divide the students into 2 groups.
- ❖ Supply each group 2 sets of number cards from 0 to 9.
- ❖ Each student will take one set.
- ❖ Flip the cards to hide the numbers.
- ❖ Jumble the cards to change the order.
- ❖ One student from the first group selects 4 cards and makes a four digit number with them.
- ❖ Second student in the same group selects 4 cards from second set of numbers and makes another four digit number.
- ❖ Then they add two numbers and write down the sum in the note book.
- ❖ Every group does the same.
- ❖ The group which gets the largest sum will get 1 point.
- ❖ After 10 rounds who got more points they will be declared as winners.

Group-1

5	4	9	3
(+)	7	8	2
1	3	3	1
			9

Group-2

(+)			

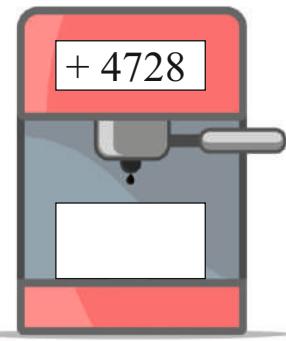
Group-3

(+)			

etc....

3.2 Addition Machine:

This is an Addition machine. It has a fixed 4-digit number 4728. If you place any 4 digit number in the machine, it is added to 4728 and the sum is displayed on the screen. You should place a 4-digit number of your choice and find the number displayed by the machine.



1. 2 8 9 6	2. -----	3. -----	4. -----	5. -----
(+) 4 7 2 8	(+) 4 7 2 8	(+) 4 7 2 8	(+) 4 7 2 8	(+) 4 7 2 8
<hr/> <hr/>				
7 6 2 4				

Do this:

1. Add

a) 1 3 6 5

(+) 7 6 3 5

b) 7 9 8 9

(+) 1 1 1 1

c) 4 6 0 9

(+) 3 8 8 4

d) 9 9 9 9

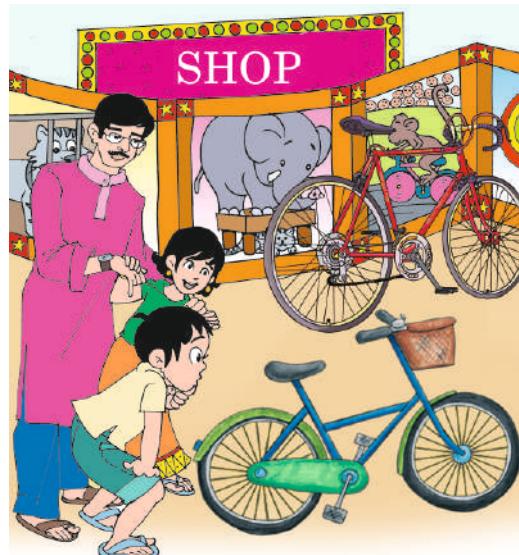
(+) 7 2 4

2. Add 4789 and 2946

3. Find $7645 + 5895$

3.3 Addition by Estimation:

Bhavadeep, Mokshith and their father Ravi went to purchase bicycles. The shop keeper said the big cycle costs ₹ 5100 and the small cycle costs ₹ 3850. Ravi had ₹ 10000 with him. He thought whether the amount would be sufficient or not to purchase two bicycles.



Let's help Ravi in guessing the sum.

If we rounded off 5100 to its nearest thousands then we get 5000

If we rounded off 3850 to its nearest thousands then we get 4000

The sum of 5100 and 3850 is now nearer to $5000 + 4000 = 9000$

So, the estimated amount is ₹ 9000.

Example - 2

In another shop there are two types of bicycles namely gear bicycles and small bicycles.

Now you find out the two bicycles whose cost would be less than ₹10000 and fill the table. The cost of each bicycle is given in boxes.

GEAR BICYCLES



₹ 7150

₹ 5100

₹ 8150

SMALL BICYCLES



₹ 1800

₹ 2670

₹ 3850

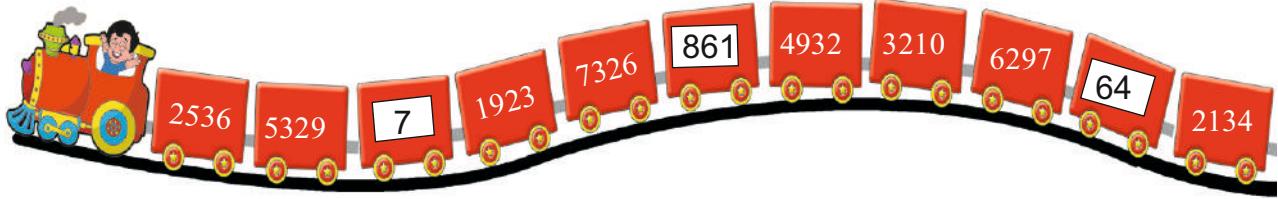
S.No	Cost of Gear bicycle	Cost of small bicycle	Cost of Gear bicycle rounded nearest to thousands	Cost of small bicycle rounded nearest to thousands	Total Cost
1	₹ 7150	₹ 1800	₹ 7000	₹ 2000	₹ 9000
2					
3					
4					
5					

Do this:

- Estimate the sum in each case and tick (✓) on the correct box which is nearest to its sum.

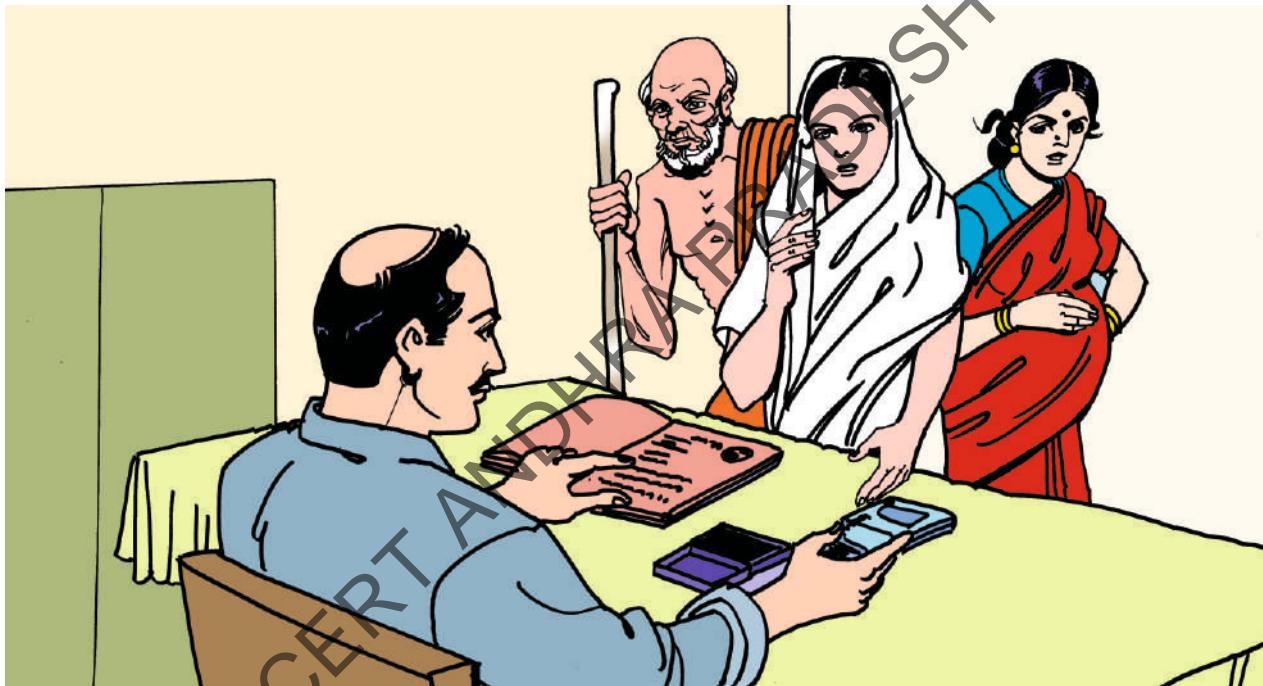
1	1686 + 3250	4000	5000	6000	7000
2	2432 + 2980	4000	5000	6000	7000
3	3480 + 5700	6000	7000	8000	9000
4	1984 + 5680	6000	7000	8000	9000
5	4830 + 987	6000	7000	8000	9000

2. Estimate the Sum



There is a kids train. All the compartments have their numbers on them. Find the pairs of compartments whose sum is greater than 8000.

GRAMA SABHA



In Mahasingi panchayat, the village secretary collected ₹ 5960 towards House Tax, ₹ 2398 towards water tax and ₹ 895 towards other cess. Find the total amount collected? Help the Secretary to find out the total amount.

Amount collected towards House tax
Amount collected towards Water tax
Amount collected towards other cess
Total amount collected by the Secretary

Th	H	T	O
(2)	(2)	(1)	
=	₹ 5	9	6 0
=	₹ 2	3	9 8
=	₹ 8	9	5
=	₹ 9	2	5 3

Example- 3

Total expenditure of Anuradha's family in a month is ₹ 9385. If she saves ₹7895, what is her income in the month?

Solution:

$$\begin{array}{lcl} \text{Expenditure of Anuradha's family} & = & \text{₹} \\ \text{Money saved} & = & \text{₹} \\ \text{Her income in the month} & = & \text{₹} \end{array}$$

T	th	Th	H	T	O
	(1)	(1)	(1)		
	9	3	8	5	
+	7	8	9	5	
	1	7	2	8	0

Example- 4

There are 1786 scooters in a parking place. The number of bikes is 396 more than the number of scooters . Find the number of bikes in the parking place.



Solution: Total number of bikes = number of scooters + number of bikes more than scooters.

$$\text{Number of Scooters in the parking place} =$$

$$\text{Number of bikes more than the scooters} =$$

$$\text{Total number of bikes in the parking place} =$$

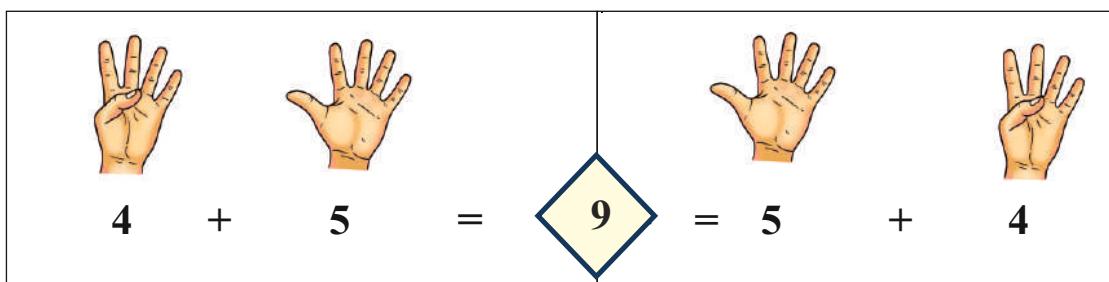
T	h	H	T	O
(1)	(1)	(1)		
1	7	8	6	
		3	9	6
	2	1	8	2

Do this:

1. A water tank supplies drinking water to two villages. One village gets 3870 buckets of water. The other gets 5295 buckets. How many buckets of water in total are supplied to both the villages?
2. On an Independence day, 7365 saplings were planted in schools and 2859 saplings were planted in offices. How many saplings were planted in total?



Observe the following additions.



Find the sum of 3265 and 2678

Pavan added like this:

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

$3265 + 2678 = 5943$

Charan added like this:

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

$2678 + 3265 = 5943$

Conclusion: $3265 + 2678 = 2678 + 3265$

If two numbers are added in any order we always get the same sum.

Making a word problem

Example - 5 $2568 + 3890 = ?$ Make a word problem



In Ramapuram village,
there were 2568 male and
3890 female population.
What is the total
population of the village?



Srinu has ₹ 2568 and
Seshu has ₹ 3890.
What is the total
amount with them?

Try this:

Make word problems for the following.

- a) $6854 + 3521$ b) $5340 + 3564$ c) $4563 + 8520$

● 3.4 Addition in expanded form:

Example - 6 $234 + 425$

We can add numbers in another way, observe the following procedure.

Now we add 234 and 425 using expanded form.

$$\begin{array}{r} 200 + 30 + 4 \\ 400 + \boxed{600} + \boxed{} + \boxed{} \\ + 20 + \boxed{} + 50 + \boxed{5} \\ + 5 + \boxed{} + \boxed{} + 9 \\ = 600 + 50 + 9 \\ = 659 \end{array}$$

$$234 = 200 + 30 + 4$$

$$425 = 400 + 20 + 5$$

$$659 = 600 + 50 + 9$$

Mental Addition

Now let's discuss on Mental Addition. The basic idea is to add in parts, such as tens and ones separately.

For example to find $7+8$ in an easy way ,7 is close to 10 and less by 3, So we write 8 as $3+5$.

$$\text{So, } 7 + 8 = 7 + 3 + 5$$

$$= 10 + 5 = 15$$

or

$$7 + 8 = 5 + 2 + 8$$

$$= 5 + 10 = 15$$

Example- 7 Add $386 + 9$.

Solution: We rewrite the above in the following way.

$$\begin{aligned} 386 + 9 &= 386 + 4 + 5 \quad (9=4+5) \\ &= 390 + 5 \\ &= 395 \end{aligned}$$

Example- 8 Find the sum by suitable regrouping.

$$38 + 26 + 24 + 12$$

Solution: We have to re-group the above numbers for easy addition as

$$\begin{aligned} 38 + 12 + 26 + 24 \\ &= 50 + 50 \\ &= 100 \end{aligned}$$

Example- 9 Find the sum by suitable re-grouping.

$$47 + 584 + 416 + 953$$

Solution: Re-group the given numbers.

$$\begin{aligned} \text{We get } 584 + 416 + 953 + 47 \\ &= 1000 + 1000 \\ &= 2000 \end{aligned}$$



Try this:

1. Find the missing numerals.

a) $7\ 3\ \square\ \square$

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

b) $4\ 7\ \square\ 9$

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

2. Find the sum by suitable re-grouping.

a) $740 + 320 + 260 + 2680$

b) $5986 + 2976 + 14 + 24$

c) $4893 + 894 + 106 + 107$



3.1 Exercise

1. Add

a) $6\ 9\ 7\ 6$

$$\begin{array}{r} (+)\ 3\ 4\ 6\ 8 \\ \hline \end{array}$$

b) $8\ 0\ 7\ 9$

$$\begin{array}{r} (+)\ 4\ 8\ 9\ 8 \\ \hline \end{array}$$

c) $5\ 3\ 7\ 9$

$$\begin{array}{r} (+)\ 8\ 9\ 6\ 5 \\ \hline \end{array}$$

d) $6\ 4\ 3\ 5$

$$\begin{array}{r} 9\ 8\ 7 \\ (+)\ 7\ 6 \\ \hline \end{array}$$

2. Identify whether the following additions are correct or not. Justify your answer.

a) $3\ 6\ 4\ 8$

$$\begin{array}{r} (+)\ 4\ 8\ 2\ 6 \\ \hline 7\ 4\ 6\ 4 \end{array}$$

b) $5\ 0\ 1\ 7$

$$\begin{array}{r} (+)\ 3\ 9\ 7\ 7 \\ \hline 9\ 0\ 9\ 4 \end{array}$$

c) $3\ 8\ 9\ 7$

$$\begin{array}{r} (+)\ 4\ 0\ 6\ 9 \\ \hline 7\ 8\ 5\ 6 \end{array}$$

3. Write word problems for the following additions.

a) $3268 + 5634 = ?$

b) $6240 + 5425 = ?$

4. Fill in the blanks.

a) $632 + 984 = 984 + \text{-----}$

b) $2735 + \text{-----} = 2569 + 2735$



5. A number exceeds 6897 by 5478. What is that number?

6. Veerayya sold maize for ₹ 5397 and pearl millets for ₹ 3849 in a village fair. How much amount did he get?

7. Madhav produced 3985 watermelons in his field. Vijendar produced 854 more than Madhava's. What is the total number of watermelons produced by him?



8. The number of visitors to Arasavalli temple on three consecutive days in Karthika masam is 3842, 2642 and 1958 respectively. What is the total number of visitors during these days?

Project Work

Collect your village information from your **Panchayat Secretary** and fill the information in the given table.

Village Name:

	Population	Literates	Illiterates	Voters
Male				
Female				

Answer the following questions.

- * What is the total population of your village?
- * What is the sum of the total literates and illiterates?
- * Compare the male and female literates.
- * Is the sum of voters equal to the total population? What do you observe?



Y9W4P4

4. 0 Subtraction without borrowing

Teacher: What do you see in the picture?

Student: Gum bottle, letters, men, women, dustbin ...,

Teacher: Can you say the name of this place?

Student: Yes, it is a post office.

Teacher: What we do at the post office?

Student: We post letters, transfer, deposits and withdraw money.

Teacher: What do you think Saidulu is doing at the post office?

Student: I don't know

Saidulu is a vegetable seller. He deposits his daily profit with the post office. In a particular week he deposited like this.



Day	Deposit
Monday	₹ 850
Tuesday	₹ 700
Wednesday	0
Thursday	₹ 600
Friday	₹ 925
Saturday	₹ 650



What is the difference between the amounts deposited on Monday and Tuesday?

How do we find the difference?

What is the mathematical process required to find the difference?

Yes, subtract smaller value from the bigger value.

So, the difference = ₹ 850 - 700 = ₹ 150 (or)

$$\begin{array}{r}
 850 \\
 -700 \\
 \hline
 150
 \end{array}$$

What is the amount available in his account?

How do you find it? We add all deposits during the week.

$$\begin{aligned}
 \text{Sum} &= 850 + 700 + 600 + 925 + 650 \\
 &= ₹ 3725
 \end{aligned}$$

Saidulu deposited some money in the Post office and updated his passbook. ₹ 3725 was available on that day. On next Monday he withdrew ₹ 3200 from his account. How much money is left in his account?

Let's find the balance amount. How?

$$\text{Balance} = \text{Total amount existing} - \text{amount withdrawn}$$

Available amount = ₹
 Amount withdrawn = ₹ (-)
 Amount left in his account = ₹

Th	H	T	O
3	7	2	5
3	2	0	0
0	5	2	5

Explanation:

Subtracting Ones : 5 Ones – 0 Ones = 5 Ones
 Write 5 under Ones column

Subtracting Tens : 2 Tens – 0 Tens = 2 Tens
 Write 2 under Tens column

Subtracting Hundreds : 7 Hundreds – 2 Hundreds = 5 Hundreds

Subtracting Thousands : 3 Thousands – 3 Thousands = 0 Thousands



Example - 1 Subtract 4235 from 9467.

Solution:

Arrange the given numbers in columns and subtract column wise, we get



Do you know?

$$\begin{array}{r}
 9467 \text{ (Minuend)} \\
 4235 \text{ (Subtrahend)} \\
 \hline
 5232 \text{ (Difference)}
 \end{array}$$

Th	H	T	O
9	4	6	7
(-)	4	2	3
5	2	3	2

(Minuend)
 (Subtrahend)
 (Difference)

4.1 Subtraction by re-grouping

The Riverview Park is situated on the bank of Nagavali river in Srikakulam. On a Sunday 3264 persons visited the park. Out of these, 1896 were adults and the remaining were children. How many children visited the park on Sunday?



To know the number of children who visited the park, we have to subtract the number of adults (1896) from the total number of persons, who visited the park (3264).

Number of persons visited the park =

Number of adults visited the park = (-)

Number of children visited the park =

Th	H	T	O
(2)	(11)	(15)	(14)
	1	5	
3	2	6	4
1	8	9	6
1	3	6	8

Explanation:

Step -1 Subtracting Ones:

We want to subtract 6 from 4 . But, $6 > 4$

So, we change 1 ten into 10 ones, leaving behind 5 tens.

Now 1 ten + 4 ones = 10 ones + 4 ones = 14 ones

14 ones - 6 ones = 8 ones (write 8 under ones column)

Th	H	T	O
		5	(14)
3	2	6	4
1	8	9	6
			8

Step - 2 Subtracting Tens :

Observe the digits in tens column they are 5 and 9 (why?)

We want to subtract 9 from 5. But, $9 > 5$

So, from the Hundreds column,

we change 1 Hundred into 10 tens

leaving behind 1 Hundred

Now 1 Hundred + 5 Tens = 10 Tens + 5 Tens = 15 Tens

$15 \text{ Tens} - 9 \text{ Tens} = 6 \text{ Tens}$ (write 6 under Tens place)

Th	H	T	O
		(15)	(14)
	1	5	
3	2	6	4
1	8	9	6
		6	8

Step - 3 Subtracting Hundreds

We want to subtract 8 from 1, But $8 > 1$

So, from the thousands column,

we exchanged 1 thousand into 10 hundreds

leaving behind 2 Thousands

Now, $1 \text{ Thousand} + 1 \text{ Hundred} = 10 \text{ Hundreds} + 1 \text{ Hundred}$

$= 11 \text{ Hundreds}$

$11 \text{ Hundreds} - 8 \text{ Hundreds} = 3 \text{ Hundreds}$

(write 3 under Hundreds column)

Th	H	T	O
	(11)	(15)	(14)
2	1	5	
3	2	6	4
1	8	9	6
	3	6	8

Step - 4 Subtracting Thousands

$2 \text{ Thousands} - 1 \text{ Thousand} = 1 \text{ Thousand}$

(write 1 under Thousands column)

Thus $3264 - 1896 = 1368$

Th	H	T	O
(2)	(11)	(15)	(14)
	1	5	
3	2	6	4
1	8	9	6
1	3	6	8

Note: We can check the answer in the following way. If we add the answer to the smaller number, we should get the bigger number.

In the above case:

Smaller number = 1896 (Subtrahend)

Answer obtained = (+) 1368 (Difference)

3264 (Bigger Number)

Hence the answer is correct. (Minuend)

Do you know?



Minuend =
Subtrahend +
Difference

Do this:

1.

a) 8 4 5 7

(-) 5 8 9 7

b) 9 0 4 0

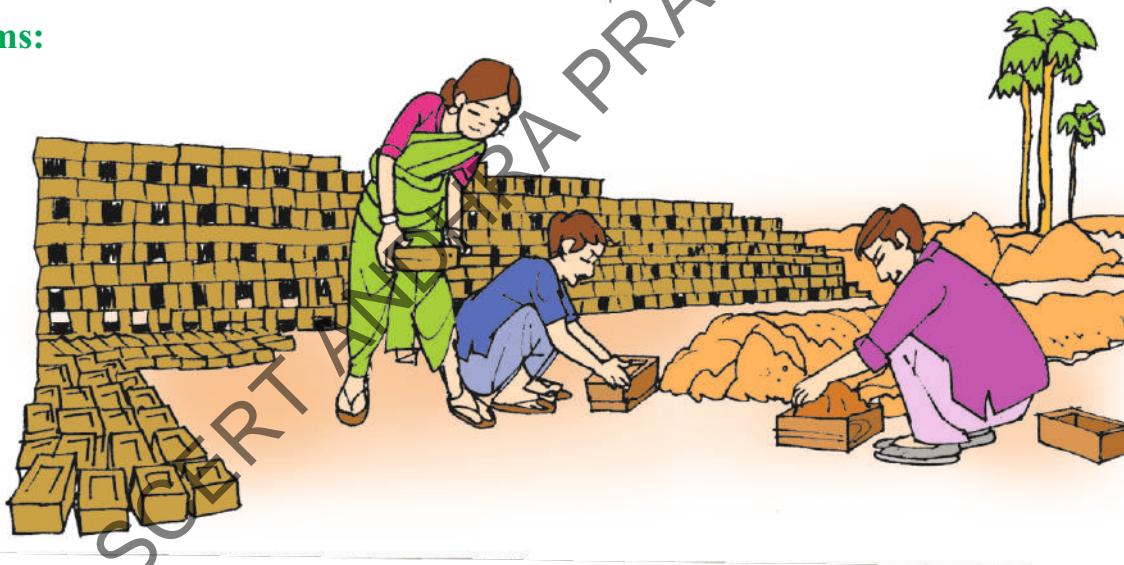
(-) 3 6 2 7

c) 5 0 0 0

(-) 2 8 2 9

2. Subtract 4385 from 9230

Word Problems:



Example - 2

Raminaidu made 8450 bricks in his brick yard. After selling some bricks, 4852 bricks were left in the yard. How many bricks were sold?

Solution: The number of bricks sold = Number of bricks made
- number of bricks left

Number of bricks made =

Number of bricks available now = (-)

Number of bricks sold =

Th	H	T	O
7	13	14	10
	x	A	
8	4	5	0
4	8	5	2
3	5	9	8

Example - 3 Rajani bought a saree for ₹ 9000 and Ramani bought another saree for ₹ 6895.

How much money did Rajani pay more than Ramani?

Solution:

Cost of the saree purchased by Rajani	=	
Cost of the saree purchased by Ramani	=	
Money paid by Rajani more than Ramani	= ₹	

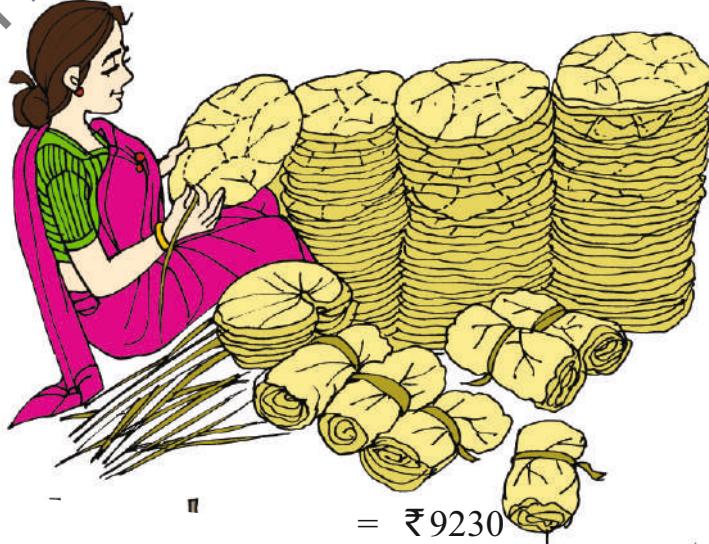
Th	H	T	O
8	9	9	10
	10	10	
9	0	0	0
6	8	9	5
2	1	0	5

Do this:

1. Sri krishna had ₹ 9213 in his bank account. He withdrew ₹ 7435. How much money was left in his account?
2. Nanaji wanted to buy a sprayer of cost ₹ 9500. Government provided a subsidy of ₹ 2500. Then how much money should he pay?

4.2 Subtraction by Estimation:

Leela collects Addakulu from the forest at Araku. She sells the leaves for ₹ 9230. She purchased some household items for ₹ 5890. How much money did she have now? Can you guess? Estimate the answer.



Money earned by selling the leaves

= ₹ 9230

If 9230 is rounded off to its nearest thousands then we get 9000.

Money spent for purchasing household items = ₹ 5890

If 5890 is rounded off to its nearest thousands then we get 6000.

Money left with her approximately = 9000 - 6000 = ₹ 3000

Do this:

1. In a village, there are 8142 trees. Out of these 3780 trees fell down due to Hud-hud cyclone. The number of trees remaining is..... (approximately)
a) 3000 b) 4000 c) 5000 d) 6000
2. The sum of two numbers is 7152 and one of the numbers is 5200. The other number nearest to thousands is _____
3. Write correct symbol of $<$, $>$, or $=$ by estimating the difference.
a) $2300 - 800$ $2950 - 1100$
b) $4100 - 1800$ $8005 - 6200$
c) $3900 - 890$ $7020 - 5638$

Try this:

Correct the following subtractions

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

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



4.3 Addition and Subtraction facts

Kalpana wants to go to Vizag with her daughter, Ridhi by bus. They boarded the bus. Indira is also going to Vizag. Bus fare from Narasannapeta to Vizag is ₹ 80 for a child and ₹120 for an adult. Both gave ₹ 200 each for their tickets.



How much money will be returned to Indira?



$$\begin{array}{lcl} \text{Bus fare for Kalpana} & = & ₹ 120 \\ \text{Bus fare for Ridhi} & = & (+) ₹ 80 \\ \text{Total bus fare for them} & = & ₹ \underline{\underline{200}} \end{array}$$



$$\begin{array}{lcl} \text{The amount given by Indira} & = & ₹ 200 \\ \text{Bus fare for Indira} & = & ₹ 120 \\ \text{The amount to be returned to her} & = & 200 - 120 \\ & & = ₹ 80 \end{array}$$

So, we have

$$80 + 120 = 200$$

$$200 - 120 = 80$$

We write subtraction fact from addition fact.

Children, also observe $200 - 80 = 120$

So for the addition fact $80 + 120 = 200$ we have two subtraction facts

They are

$$80 + 120 = 200$$

$$200 - 120 = 80$$

$$200 - 80 = 120$$

In the same way we write addition fact for a subtraction fact.

$$368 - 215 = 153$$

4.4 Mental Subtraction

You are already acquainted with skip counting in tens.

Let us recall it.

Consider the pattern : 90, 80, 70, --- , --- , --- , ---

Clearly, the above pattern may be completed as: 90, 80, 70, 60, 50, 40, 30



Again , consider the pattern 86, 76, 66, 56, 46, 36, 26.

(Skip counting in tens is based either on adding or subtracting 10)

Let us use this principle to carry out subtractions orally or mentally.

Example - 4

Subtract 23 from 96.

Solution: Clearly 23 is 20 and 3.

So, first we subtract 20 from 96 and then we subtract 3 from the difference so obtained.

$$\text{Now, } 96 - 20 = 76$$

$$\text{And } 76 - 3 = 73$$

$$\text{So, } 96 - 23 = 73$$

Example - 5

Subtract 38 from 54.

Solution: Clearly 38 is 40 - 2

$$54 - 40 = 14 \text{ and } 14 + 2 = 16$$

To subtract mentally,
we split the number
to be subtracted into
tens and ones



Do this:

1. Subtract mentally.

a) $95 - 21$ b) $88 - 55$ c) $68 - 47$ d) $52 - 26$ e) $73 - 37$

2. Write subtraction facts for the given addition facts.

a) $734 + 268 = 1002$

b) $3140 + 2869 = 6009$

3. Write addition facts for the given subtraction facts.

a) $480 - 320 = 160$

b) $5286 - 3812 = 1474$

Exercise - 4.1

1. Do the following.

a) 5889 b) 8926 c) 9600 d) 8001 e) 7000

(-) 3643 (-) 2634 (-) 2780 (-) 3675 (-) 4508

- Subtract 7425 from 9015.
- Take away 3086 from 8415.
- By how much is 3189 more than 2883?
- Estimate the difference to the nearest thousands by rounding .

$5742 - 4265 = \underline{\hspace{2cm}}$

- Do a quick estimate to check which of the following is more than 4000.
a) $5555 - 1266$ b) $9885 - 7657$
- Fill the place holders with **<, > or =**
a) $5000 - 1200$ $3600 - 2400$
b) $9200 - 4020$ $7680 - 2118$
c) $7900 - 4200$ $6020 - 1950$
- In a school, the children collected 8562 for CM Relief fund. The staff donated 2892 less than the amount donated by children. How much money did the staff donate?
- A website was visited by 9125 people on its first day and 6532 people on the second day. How many more people visited the website on the first day than on the second day?
- Abhiram covered a journey of 3120 kilometres to Kashmeer. He travelled 1968 kilometres by train and the rest by bus . What distance did he cover by bus?

Game:

Select any four digits, for example 8, 2, 6, 3.

Form the smallest and the biggest 4-digit numbers with these digits.

Now, subtract the smallest number from the biggest numbers.

Biggest number – Smallest number = Difference.

$$8632 - 2368 = 6264$$

Again, subtract the smallest number from the biggest number which are formed by the digits 6, 2, 6, 4.



Biggest number – Smallest number = Difference

$$6642 - 2466 = 4176$$

Again, Subtract the smallest number from the biggest number which are formed by the digits 4, 1, 7, 6

Biggest number – Smallest number = Difference

$$7641 - 1467 = 6174$$

Again, Subtract the smallest number from the biggest number which are formed by the digits 6, 1, 7, 4

Biggest number – Smallest number = Difference

$$7641 - 1467 = 6174$$

Observe that this activity stops at 6174

Select another 4 digit number. Continue the game in the same way. Observe whether you get the same number 6174 or not.

The number 6174 is known as **Kaprekar Constant**.



**Dattatreya Ramachandra
Kaprekar**

Dattatreya Ramachandra Kaprekar (1905 – 1986) an Indian Mathematician, was a school teacher worked on recreational properties of numbers . His findings include Harshad numbers, Self numbers and Demlo numbers. He discovered the special nature of the number 6174 which was named after him as **Kaprekar Constant**.

PROJECT WORK:

Collect the information from your Head master and complete the table.

Serial number	Day	Total Present in your School	Number of students availing MDM	Number of students not availing MDM
1	Monday			
2	Tuesday			
3	Wednesday			
4	Thursday			
5	Friday			
6	Saturday			

4.5 Application of Subtraction



Rangayya bought some mangoes for ₹ 200 from a farmer and he sold them for ₹ 250 in the market.

Bought for ₹ 200

Sold for ₹ 250

Do you know!
The amount of money which we pay to buy an article is its **Cost Price (C.P.)**.

Do you know!
The amount which we receive from a customer by selling an article is its **Selling Price (S.P.)**.

As, Rangayya paid ₹200 for mangoes at the garden.
Cost price of mangoes = ₹ 200

As, Rangayya received ₹250 by selling mangoes at the market.
Selling Price of the mangoes = ₹ 250

Do this:

Write the Cost Price and Selling Price from the following contexts.

- Seetha bought lemons for ₹600 and sold them for ₹850
- Laxmi bought flowers for ₹1500 and sold them for ₹1350
- Veerayya sold bananas for ₹2450 and previously he bought for ₹1940
- Adilaxmi bought leafy vegetables for ₹150 and sold them for ₹120

Complete the table:

Context	Cost Price	Selling Price	Which is more?	Which is less?
Mohan bought one quintal of Dal for ₹ 5800 and sold it for ₹ 5580				
Gopal bought a bicycle for ₹ 8860 and sold it for ₹ 9210				
Gowri bought one quintal of millets for ₹ 3250 and sold it for ₹ 3780				
Akbar bought flowers for ₹ 980 and sold for ₹ 900				

Ranjith bought a rice bag for ₹ 1540 and sold it for ₹ 1860.

After selling the bag he wanted to find out whether he got more money than he paid for it.

Cost Price of the Rice bag = ₹ 1540

Selling Price of the Rice bag = ₹ 1860

$$1540 < 1860$$



Clearly he observed that Cost Price < Selling Price

The extra amount is called “**profit**”

So profit = selling price - cost price.

Do You Know !!!



When the selling price (S.P.) of an article is more than its Cost Price (C.P.) a **Profit** is made.

Thus, Ranjit got profit.

Keerthi bought a mobile phone for ₹ 8550 and sold it for ₹ 7800. Does she get profit?

$$\text{Cost Price of a mobile} = \text{₹ } 8550$$

$$\text{Selling Price of a mobile} = \text{₹ } 7800$$

$$8550 > 7800$$

$$\text{Cost Price} > \text{Selling Price}$$

Here Keerthi got some amount less than she bought by selling it. This amount is called “**loss**”

So loss = cost price - selling price.



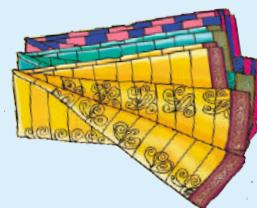
When the Selling Price (S.P.) of an article is less than its Cost Price (C.P.) a **Loss** is made.

So, Keerthi got loss.



Do this:

1. Say whether profit or loss made in each of the following cases.
 - a) CP = ₹ 3100 SP = ₹ 2950
 - b) CP = ₹ 2505 SP = ₹ 3160
2. Padmaja bought a saree for ₹ 7500 and sold it to Rupa for ₹ 5850. Say whether Padmaja made profit or loss?



Exercise - 4.2

1. Write 'P' for Profit and 'L' for Loss in the given brackets for the following.

- | | | |
|----------------|-------------|-----|
| a) CP = ₹ 420 | SP = ₹ 390 | [] |
| b) CP = ₹ 920 | SP = ₹ 990 | [] |
| c) CP = ₹ 4860 | SP = ₹ 5002 | [] |
| d) CP = ₹ 3140 | SP = ₹ 2849 | [] |
| e) CP = ₹ 2195 | SP = ₹ 3000 | [] |



2. A shop keeper bought a bag of sugar for ₹ 1650 and sold it for ₹ 90 more. Say whether he made profit or loss?
3. Kumar bought oranges for ₹ 1520 and sold them for ₹ 150 less. Say whether it is profit or loss?
4. Rahim bought umbrellas for ₹ 2100 and sold them for ₹ 1950. Say whether it is profit or loss?
5. Salman bought a goat for ₹ 7850 and sold it for ₹ 8325. Say whether it is profit or loss?

Solve Puzzle:

Horizontal	Vertical
1. $9 + 9$	1. $8 - 7$
3. $7 - 6$	2. $13 - 5$
4. $7 + 8$	3. $9 + 6$
5. $9 + 7$	4. $1 + 0$
6. $8 - 2$	5. $8 + 8$
8. $5 + 7$	6. $12 - 6$
10. $9 - 4$	8. $3 - 2$
	9. $9 - 7$

1	2		3
		4	10
5	6		
7		8	9



Chapter

Multiplication



5

5.0 Introduction

Nikhila, along with her family members went to an exhibition. They were two children and three adult in all. The entrance-fee for adult is ₹ 120 and for child is ₹ 65. Nikhila's father gave ₹ 500 to buy tickets.

How much does he need to pay for the tickets?

“Can you tell how much it is?

Rajani worked out it as follows...

First, let me find the cost of tickets for two children.



Entrance fee for each child	= ₹ 65
Number of children	= 2
Total entrance fee for two children	$= 65 \times 2$ = ₹ 130

In 65×2 , 65 is called Multiplicand, and 2 is Multiplier and result is called Product

Now, let me find the cost of tickets for three adults.

Entrance fee for each adult	= ₹ 120
Number of adults	= 3
Total entrance fee for adults	$= 120 \times 3$ = ₹ 360

multiplicand = _____
multiplier = _____
product = _____

Total amount to be paid =
₹ 130 + ₹ 360 = ₹ 490

If three children and four adults of your family went to the exhibition, then how much do you need to pay?

- Cost of ticket for each child = _____
- Number of children went to the exhibition = _____
- Total cost of tickets for children = _____
- Cost of ticket for each adult = _____
- Number of adults went to the exhibition = _____
- Total cost of tickets for adults = _____
- Total cost of tickets for children and adults = _____

Do this:

Answer the following

- In the multiplication fact $124 \times 2 = 248$, write multiplicand, multiplier and the product.
- Find the products.
a) 243×2 b) 232×3 c) 212×4 d) 440×2

Let us observe : Observe the following multiplications and fill in the blanks.

1) $1 \times 200 = \underline{200}$	1) $1 \times 300 = \underline{300}$	1) $1 \times 400 = \underline{400}$
2) $2 \times 200 = \underline{400}$	2) $2 \times 300 = \underline{\quad}$	2) $2 \times 400 = \underline{\quad}$
3) $3 \times 200 = \underline{600}$	3) $3 \times 300 = \underline{\quad}$	3) $3 \times 400 = \underline{\quad}$
4) $4 \times 200 = \underline{\quad}$	4) $4 \times 300 = \underline{\quad}$	4) $4 \times 400 = \underline{\quad}$
5) $5 \times 200 = \underline{\quad}$	5) $5 \times 300 = \underline{\quad}$	5) $5 \times 400 = \underline{\quad}$
6) $6 \times 200 = \underline{\quad}$	6) $6 \times 300 = \underline{\quad}$	6) $6 \times 400 = \underline{\quad}$
7) $7 \times 200 = \underline{\quad}$	7) $7 \times 300 = \underline{\quad}$	7) $7 \times 400 = \underline{\quad}$
8) $8 \times 200 = \underline{\quad}$	8) $8 \times 300 = \underline{\quad}$	8) $8 \times 400 = \underline{\quad}$
9) $9 \times 200 = \underline{\quad}$	9) $9 \times 300 = \underline{\quad}$	9) $9 \times 400 = \underline{\quad}$
10) $10 \times 200 = \underline{\quad}$	10) $10 \times 300 = \underline{\quad}$	10) $10 \times 400 = \underline{\quad}$

What do you observe?

Do this: Write the following products.

1) $11 \times 200 =$ _____

$200 \times 11 =$ _____

2) $13 \times 200 =$ _____

$200 \times 13 =$ _____

3) $12 \times 300 =$ _____

$300 \times 12 =$ _____

4) $14 \times 300 =$ _____

$300 \times 14 =$ _____

5) $12 \times 400 =$ _____

$400 \times 12 =$ _____

6) $14 \times 400 =$ _____

$400 \times 14 =$ _____

7) $4 \times 500 =$ _____

$500 \times 4 =$ _____

8) $6 \times 500 =$ _____

$500 \times 6 =$ _____

What do you observe?

$13 \times 200 =$
 $200 \times 13,$
 is it?



If two numbers are multiplied in any order the product is always the same. Observe the following

$12 \times 100 = 100 \times 12$

$16 \times 100 = 100 \times 16$

● 5.1 Multiplication of a 3-digit number by a 1-digit number :

Gangaraju of Sarugudu village collects custard-apples from the forest and sells in the village market. One day he collected 3 baskets of custard-apples and sold each basket at ₹145. How much money did he earn?

Can you help him to calculate?

Praneetha worked out in the following way....

Cost of one basket of custard-apples = ₹145

Cost of three baskets of custard-apples = 145×3

She wrote the expanded form of 145 as $100 + 40 + 5$



To find the cost
of 3 baskets of
custard-apple

$(100 + 40 + 5) \times 3$

$100 \times 3 = 300$

$40 \times 3 = 120$

$5 \times 3 = 15$

By adding the results in three places, we get $300 + 120 + 15 = ₹ 435$



First, I multiplied 5 by
3, next 40
and 100 then added
these three products.

Gangaraju got ₹ 435

Chandradeep did as follow.....

Step - 1 Cost of one basket of custard-apples = ₹ 145

Cost of three baskets of custard-apples = ?

$$\begin{array}{r} 145 \\ \times 3 \\ \hline \end{array}$$

Step - 2



$5 \times 3 = 15$ ones
In 145, multiply by 5 in ones place
by 3, the product is 15, write 5 in 15
under ones place and 1 above the 4 in
tens place.

Hundreds	Tens	Ones
1	(1) 4 x	(5) 3
		5

Step - 3



$4 \times 3 = 12$, and $12 + 1 = 13$ tens
In 145, multiply by 4 in tens place by
3, the product is 12 then add 1, we get
13 tens, write 3 in 13 under tens place
and 1 above the 1 in hundreds place .

Hundreds	Tens	Ones
(1)	(1)	
1	4 x	5 3

Step - 4



$1 \times 3 = 3$, and $3 + 1 = 4$ hundreds
In 145, multiply by 1 in hundreds place
by 3, the product is 3 then add 1, we get
4 hundreds, write 4 under hundreds
place. Now the product is 435.

Hundreds	Tens	Ones
(1)	(1)	
1	4 x	5 3

Sharif did as follows...

$$145 \times 3 = \frac{11}{\underline{145 \times 3}} \quad \text{H T O}$$

$$\underline{\quad \quad \quad 435}$$



What do you observe from the above?

Do this:

- 1) Find the products in the above methods and observe the answers.
 - a) 164×2
 - b) 246×3
 - c) 209×4
- 2) Verify the following and correct them wherever necessary.
 - a) 264×2
= 4128
 - b) 342×3
= 1026
 - c) 253×4
= 82012

Try this:

- 1) In Chammachintha school, there are 126 pupils. The teacher asked them to plant saplings in the nearby village. If each student planted 4 saplings, how many saplings did they plant?
- 2) If a box contains 164 mangoes, how many mangoes will be there in 5 such boxes?
- 3) Ramayya went to agriculture work for 2 days. If his wage was ₹ 425 per day, what was the total wage for 2 days?

$$423 = 4 \text{ hundreds} + \\ 2 \text{ tens} + 3 \text{ ones}$$

Maths Lab Activity:

Multiplication using straws.

Objective

The students learn to multiply using straws.

Material required

: Take 3 different coloured straws each about 10 in number.
(say blue for ones, red for tens and green for hundreds)

Procedure

: The problem is written on the board. Multiply 423 by 4.
The teacher writes the expanded form of the number 423.

The students use the three different coloured straws for hundreds, tens and ones. So they take 4 green, 2 red and 3 blue straws and place them as shown below. Alternately you can draw four green lines, two red lines and three blue lines with colour chalks.

The straws for the number 4 (ones) placed across the straws with the help of pins/drawing pins showing 423×4 . The straws which are in vertical position represent the multiplicand (423), similarly the horizontal straws represent the multiplier (4). Count the number of common points on the horizontal and vertical straws. There are sixteen such points in hundreds place. There are 8 such common points in tens place. There are 12 such points in ones place.

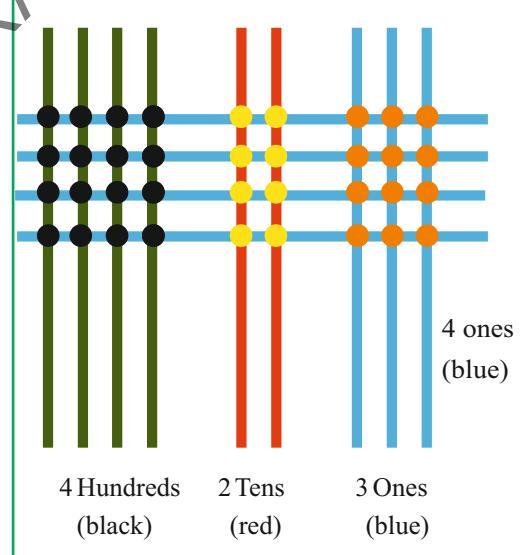


The net result is 16 hundreds + 8 tens + 12 ones

$$\begin{aligned}
 &= 16 \text{ hundreds} + 8 \text{ tens} + (\text{one ten} + 2 \text{ ones}) \\
 &= 16 \text{ hundreds} + (8 \text{ tens} + \text{one ten}) + 2 \text{ ones} \\
 &= 16 \text{ hundreds} + 9 \text{ tens} + 2 \text{ ones} \\
 &= 1600 + 90 + 2 \\
 &= 1692
 \end{aligned}$$

Therefore, the product of 423×4 is 1692

$$423 \times 4 = 1,692$$



Do this:

Do the following by above method.

a) $114 \times 3 =$ _____

b) $314 \times 4 =$ _____

c) $213 \times 5 =$ _____

d) $134 \times 6 =$ _____

e) $243 \times 5 =$ _____

f) $126 \times 7 =$ _____

5.2 Multiplication of a 3-digit number by a 2-digit number:

On her birthday, Sita decided to present blankets to the poor people on the road side. Her father appreciated her decision and took her to cloth store.

The shop-keeper appreciated her decision of kindness and offered at ₹ 295 which actually costs 350. She bought 14 blankets. Sita's father asked the shop-keeper, "How much do we need to pay?"

The shop-keeper has done the multiplication as follows.....

The amount to be paid to shop-keeper by Sita's father
= ₹ 4,130

The next day, teacher explained another method to do the same multiplication.

Multiplication as done by the teacher:

Step - 1

Thousands	Hundreds	Tens	Ones
	2 x 1	9 1	5 4
1	1	8	0

Class - 4

$$295 \times 14 =$$

$$\begin{array}{r}
 295 \\
 \times 14 \\
 \hline
 1180 \\
 + 295 \\
 \hline
 4130
 \end{array}$$

(295 × 4)
(295 × 1)



Thousands	Hundreds	Tens	Ones
	2 x 1	9 1	5 4
1	1	8	0
2	9	5	0

(14 = 10 + 4)
 295×4

First multiply 295 by 4 and write down the result.

← (14=10+4)
← 295×4
← 295×10

Now multiply 295 with 10 and write down the result.



Thousands	Hundreds	Tens	Ones
	2 x	9 1	5 4
1	1	8	0
2	9	5	0
4	1	3	0

$$(14=10+4)$$

$$295 \times 4$$

$$295 \times 10$$

Add both the results. Write down as shown in the table.

Example -1 A weaver's family produced 23 sarees. They sold each saree in the market at ₹385. Calculate the money they earn.

Solution:

Cost of each saree	= ₹385
Number of sarees sold	= 23
Total money earned	= 385×23



$$\begin{array}{r}
 385 \\
 \times 23 \\
 \hline
 1155 \\
 + 7700 \\
 \hline
 8855
 \end{array}
 \begin{array}{l}
 (385 \times 3) \\
 (385 \times 20)
 \end{array}$$

The weaver's family earned = ₹ 8,855

(Note: $23 = 20 + 3$)

Do this:

Do the following multiplications

a) 342×15

b) 423×21

c) 233×26

Try this:

- How many trees are there in the garden, if there are 124 rows and each row contains 65 trees?
- The owner of a dairy farm sold 496 milk packets in 15 days. If each packet was sold at ₹ 25, how much money did he earn?

5.3

Fun with Multiplication

Write your age in years : _____

Multiply it by 7 : _____

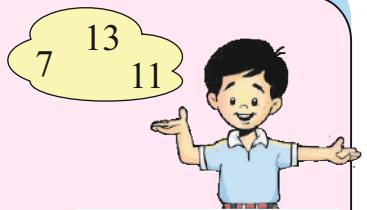
Again multiply the result by 13 : _____

Multiply the above result by 11 : _____

Now look at the answer. Can you find your age in that answer?

How many times does your age occur in the answer?

Now try this trick with your friends and family members.



$$\text{---} \times 7 = \underline{\hspace{2cm}}$$

$$\text{---} \times 13 = \underline{\hspace{2cm}}$$

$$\text{---} \times 11 = \underline{\hspace{2cm}}$$

Exercise - 5.1

1. Multiply

a) 348×37 b) 456×48 c) 654×55 d) 708×64

2. The cost of a chair is ₹ 375. What is the cost of 18 such chairs?

3. Raju delivers 157 news papers each morning. How many newspapers does he deliver in 31 days?

3) 42 boys in a class planned a picnic. If each boy contributes ₹ 168, how much money was collected?

4) The bus fare from Vizag to Vijayawada is ₹ 650. If 28 passengers travelled from Vizag to Vijayawada, how much money have they paid?

5) Raju buys 65 crates of mangoes at ₹ 285 per crate. How much money does he pay?

6) There are 576 buttons in a packet. Find the number of buttons in 82 such packets.



Project work:-

Collect the prices of the following commodities from your nearest groceries-shop and complete the table.

S.No	Commodity	Price per 1kg (in Rs)	Quantity (in kgs)	Total cost (in Rs)
1	Rice		120 kg	
2	Black-gram		45 kg	
3	Green-gram		35 kg	
4	Red-gram		43 kg	
5	Bengal-gram		40 kg	
6	Sugar		26 kg	
	Total	-	-	

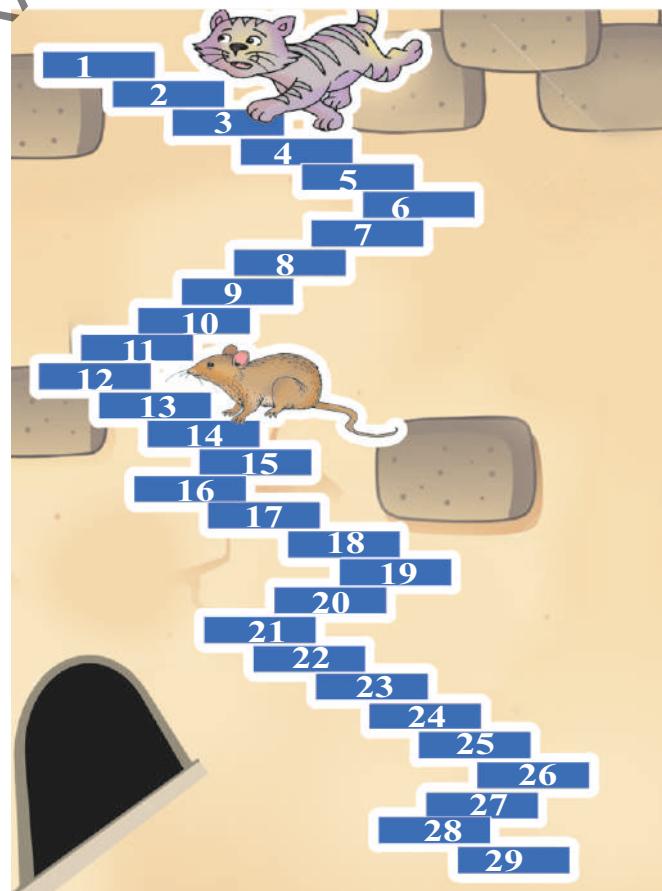
How much money is required to buy the above commodities _____

● 5.4 Introduction of Multiples

The mouse and the cat

A cat is trying to catch the mouse.

The mouse can jump 2 steps at each time. It reached 14^{th} step at present. The cat is on the 3^{rd} step and can jump 3 steps at a time. Both of them started jumping. As soon as the mouse reaches the 28^{th} step, it hides in the hole and escapes, because, the cat is now on the 24^{th} step only. Hence the cat is disappointed.



- a) The steps on which the mouse lands on _____, _____, _____, _____, _____, _____.
- What do you observe from the above number-series?
- Complete the multiplication table of 2 and observe.

$$\begin{aligned}2 \times 1 &= \underline{\hspace{2cm}} \\2 \times 2 &= \underline{\hspace{2cm}} \\2 \times 3 &= \underline{\hspace{2cm}} \\2 \times 4 &= \underline{\hspace{2cm}} \\2 \times 5 &= \underline{\hspace{2cm}} \\2 \times 6 &= \underline{\hspace{2cm}} \\2 \times 7 &= \underline{\hspace{2cm}} \\2 \times 8 &= \underline{\hspace{2cm}} \\2 \times 9 &= \underline{\hspace{2cm}} \\2 \times 10 &= \underline{\hspace{2cm}} \\2 \times 11 &= \underline{\hspace{2cm}} \\2 \times 12 &= \underline{\hspace{2cm}} \\2 \times 13 &= \underline{\hspace{2cm}} \\2 \times 14 &= \underline{\hspace{2cm}}\end{aligned}$$

If we multiply 1, 2, 3, 4, by 2, we get 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26 and so on.
Hence these are multiples of 2.



- b) The steps on which the cat lands on _____, _____, _____, _____, _____, _____, _____, _____.

What do you observe in the above number series?

Let's complete the multiplication table of 3 and observe.

$$\begin{aligned}3 \times 1 &= \underline{\hspace{2cm}} \\3 \times 2 &= \underline{\hspace{2cm}} \\3 \times 3 &= \underline{\hspace{2cm}} \\3 \times 4 &= \underline{\hspace{2cm}} \\3 \times 5 &= \underline{\hspace{2cm}} \\3 \times 6 &= \underline{\hspace{2cm}} \\3 \times 7 &= \underline{\hspace{2cm}} \\3 \times 8 &= \underline{\hspace{2cm}} \\3 \times 9 &= \underline{\hspace{2cm}} \\3 \times 10 &= \underline{\hspace{2cm}}\end{aligned}$$

If we multiply 1, 2, 3, 4, by 3, the products we get, are multiples of 3.



Meow

Meow game



- ❖ How to play the game?
- ❖ All students should stand in a circle.
- ❖ Decide on a number with which the game is to be played.
- ❖ For example 4.
- ❖ Students have to say the numbers from 1, 2, 3, one by one.
- ❖ The student who has to say a multiple of 4 will cry as a cat meow- meow.

The player who remains till the end is the winner.

Which numbers did you replace with meow?

..... these are nothing but multiples of 4.

And now you play this game with 5.

Important facts of multiples are.....

- ❖ So far we have written multiples of 2, 3 and 4 to some extent only. But, we can write the multiples of a number endlessly. Endlessly is otherwise termed as infinitely. This means, we can't say the last multiple of a number.
- ❖ A number is multiple of itself.
- ❖ Every number is multiple of 1.

Recognize the multiples in the numbers chart.

1. Identifies the multiples of 6 and circle them with a red sketch-pen.
2. Identify the multiples of 9 and write X symbol on them with a green sketch-pen.
3. Underline the multiples of 10.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Write down here:

Multiples of 6: _____, _____, _____, _____, _____, _____, _____, _____, _____, _____

_____ , _____ , _____ , _____ , _____ , _____ , _____ , _____ , _____ , _____

Multiples of 9: _____, _____, _____, _____, _____, _____, _____, _____, _____, _____

_____ , _____ , _____ , _____ , _____ , _____ , _____ , _____ , _____ , _____

Multiples of 10: _____, _____, _____, _____, _____, _____, _____, _____, _____, _____

_____ , _____ , _____ , _____ , _____ , _____ , _____ , _____ , _____ , _____

Exercise - 5.2

- 1) Find the first 5 multiples of each of the following.
a) 3 b) 7 c) 8
- 2) Write the multiples of 8 below 100.
- 3) Read each of the following statements. If it is true write 'T', otherwise 'F' in the bracket.

- a) 12 is a multiple of 3 ()
- b) 57 is a multiple of 8 ()
- c) 30 is a multiple of 5 ()
- d) 47 is a multiple of 6 ()
- e) 52 is a multiple of 7 ()

- 4) Circle the multiples of 3 in the following numbers.

2, 5, 6, 9, 10, 14, 20, 21, 27, 32, 37, 36, 48.



- 5) Circle the numbers which are not multiples of 4 in the following numbers.

2, 4, 11, 8, 20, 21, 27, 28, 30, 32, 37, 40, 45, 57.

- 6) Circle the multiples of 5 in the following numbers.

2, 4, 14, 20, 21, 27, 35, 55, 25, 68, 65, 22, 39.

- 7) Write the numbers which are not multiples of 8 in the following numbers.

20, 24, 45, 32, 35, 26, 90, 8, 7, 10.



Chapter

Division

6



6.1 Introduction

Yellamma makes papads and sells them to the shops. One day she made 120 papads and was packing 10 papads per pack. Manga, her daughter helped in packing.

Yellamma asked Manga how many packets are needed to pack 120 papads?

Manga thought like this:



If we pack 2 papads in each packet, number of packets required = $120 \div 2 = 60$

If we pack 3 papads in each packets, number of packets required = $120 \div 3 = 40$

If we pack 4 papads in each packets, number of packets required = $120 \div 4 = 30$

If we pack 5 papads in each packets, number of packets required = $120 \div 5 =$

If we pack 6 papads in each packets, number of packets required = $120 \div 6 =$

If we pack 8 papads in each packets, number of packets required = $120 \div 8 =$

If we pack 10 papads in each packets, number of packets required = $120 \div 10 = 12$

So, we need 12 packets to pack 10 papads in each packet.

Think and discuss

For a fixed number of papads, if the number of papads in a packet increases, then the number of packets.....



Do this:

- If 108 pencils are packed in 9 boxes, then find the number of pencils in each box.
- Kiran arranged 168 chairs in 6 rows equally. How many chairs will be in each row?

6.1 Division of a 3-digit number by a 1-digit number.

Example - 1

268 lemons are equally packed in 2 baskets.

How many lemons are there in each basket?

Divide : $268 \div 2$

The dividend = 268, divisor = 2

Here we start the division from left. Why?

$$\begin{array}{r}
 2) 268 \text{ (} 134 \\
 -2 \downarrow \\
 \hline
 06 \\
 -6 \downarrow \\
 \hline
 08 \\
 -8 \downarrow \\
 \hline
 0
 \end{array}$$

Step - 1

Divide 2 by 2

$2 \div 2 = 1$; write 1 as the first digit in the quotient. (from left)

$2 \times 1 = 2$; write 2 below 2, subtract $2 - 2 = 0$;

Step - 2

Bring 6 down from the tens place, now divide 6 by 2.

$6 \div 2 = 3$ write 3 as the second digit in the quotient.

$2 \times 3 = 6$. Write 6 below 6, which was carried down.

Subtract $6 - 6 = 0$



Step - 3

Bring down 8 from the ones place, Now divide 8 by 2.

$8 \div 2 = 4$; write 4 as the last digit in the quotient.

$2 \times 4 = 8$; write 8 below 8, which was carried down.

subtract $8 - 8 = 0$.

Thus $268 \div 2 = 134$

Remainder = 0

Quotient = 134

so, $268 \div 2 = 134$

Example - 2

384 chairs were distributed equally in 6 rooms. Calculate how many chairs there will be in each room.

Solution: In $384 \div 6$; dividend is 384, divisor is 6.

Step - 1 Arrange the numerals as shown in the adjacent box.

Step - 2 First, we start with hundreds .

6 cannot divide 3.

So we take 3 and 8 together (38).

3 hundreds + 8 tens = 38 tens.

Now divide 38 by 6.

As $6 \times 6 = 36$,

write 6 as the first digit in the quotient, write 36 below 38.

$$38 - 36 = 2$$

Step - 3 Bring down 4.

Divide 24 by 6.

6 divides 24 for 4 times ($6 \times 4 = 24$).

write 4 in the quotient and 24 below 24.

$$24 - 24 = 0$$

Remainder = 0

Thus Quotient = 64

Hence $384 \div 6 = 64$

Dividend
Divisor 6) 3 8 4 (64 Quotient
 - 3 6
 —————
 0 2 4
 - 2 4
 —————
 0 Remainder

Do this:

- Find the quotient and remainder in the following divisions.
 - $808 \div 8$
 - $996 \div 6$
 - $408 \div 3$
- A fruit seller packed 108 custard apples in 9 baskets. How many custard apples did each basket hold?



Example - 3

On the occasion of 'vanamahotsavam', 602 saplings are to be distributed among 5 schools equally. How many saplings will each school get and how many remains undistributed?

$$\begin{array}{rcl} \text{Number of saplings to be distributed} & = & 602 \\ \text{Number of schools} & = & 5 \\ \text{Number of saplings each school will get} & = & 602 \div 5 \\ \text{Dividend} = 602 & & \text{Divisor} = 5 \end{array}$$

Step - 1 Divide 6 by 5

Now $5 \times 1 = 5$,

So, 5 divides 6 for 1 time

write 1 as first digit in the quotient.

write 5 below 6 and subtract

$6 - 5 = 1$, write 1 below 5

Step - 2 Bring down 0 from the tens place and write next to 1 to get 10.

Divide 10 by 5.

$10 \div 5 = 2$; write 2 as second digit in the quotient

$5 \times 2 = 10$, write 10 below 10

And subtract $10 - 10 = 0$

Step - 3 Bring down 2 from the ones place

Now $2 < 5$, so 5 cannot divide 2.

so, 5 divides 2 for 0 times.

Write 0 as last digit in the quotient.

$5 \times 0 = 0$ write 0 below 2

$2 - 0 = 2$

Here quotient = 120, remainder = 2.

We can check whether the division is correct or not.

$$\begin{array}{r} 5) 602 (120 \\ -5 \\ \hline 10 \\ -10 \\ \hline 2 \\ -0 \\ \hline 2 \end{array}$$



Thus $602 \div 5$
Quotient is 120
and remainder is 2.

In the above division, dividend is 602, divisor is 5, quotient is 120 and the remainder is 2. We know 5 times of 120 is 600.

That is, divisor \times quotient = 600.

The difference between the dividend and the product of divisor and quotient is 2

That is $602 - 600 = 2$ which is equal to the remainder.

$$602 = (5 \times 120) + 2$$

From this, we can conclude that

$$\text{Dividend} = (\text{Divisor} \times \text{Quotient}) + \text{Remainder}$$



Do this:

1. Divide and check the result.

a) $509 \div 9$ b) $721 \div 8$

2. Find the quotient and remainder in the following division problems.

(a) $479 \div 8$ (b) $983 \div 5$ (c) $843 \div 3$

Try this:

1. 240 and 176 are divisible by 16. Can their difference also be divisible by 16?
2. Divide 180 by 1, 2, 3, 4, 5 and 6. What do you observe?

Exercise 6.1

1. If the cost of each pen is ₹ 6, then how many pens can we get for ₹ 864?
2. 8 pupils went to circus and they paid ₹ 360 for tickets. What is the cost of each ticket?
3. One sheet of brown paper is needed to cover 6 note books. How many brown sheets are required to cover 114 such books?

4. Fill the boxes with suitable number

a) $4) 487 (1 \boxed{} \boxed{}$

$$\begin{array}{r} 4 \\ \hline 8 \\ - 8 \\ \hline 7 \\ - \boxed{} \\ \hline 3 \end{array}$$

b) $9) 763 (8 \boxed{}$

$$\begin{array}{r} 72 \\ \hline 43 \\ - 36 \\ \hline \boxed{} \end{array}$$

5. A drum has 500 litres of water. How many 20 litre cans can be filled with the water?
6. Total bus fare from Vijayanagaram to Vishakhapatnam for 9 people is ₹ 540.
What is the bus fare for each person?
7. $183 \div 9$ Rakesh did this problem like this

$9) 183 (2$ Quotient = 2
 $\begin{array}{r} 18 \\ \hline 3 \end{array}$ Remainder = 3



Is Rakesh correct? Justify your answer.

6.2 Dividing a 3-digit number by a 2-digit number

In Ramayya's garden there are 598 sapota trees, which are distributed equally in 13 rows.
How many sapota trees are there in each row?

In this problem

Number of sapota trees = 598

Number of rows = 13

Number of trees in each row = ?

What mathematical operation will be used?

we divide 598 by 13

$$13) 598 (46$$

$$\begin{array}{r} - 52 \\ \hline 78 \\ - 78 \\ \hline 0 \end{array}$$

$13 \times 0 = 0$
 $13 \times 1 = 13$
 $13 \times 2 = 26$
 $13 \times 3 = 39$
 $13 \times 4 = 52$
 $13 \times 5 = 65$
 $13 \times 6 = 78$
 $13 \times 7 = 91$
 $13 \times 8 = 104$
 $13 \times 9 = 117$
 $13 \times 10 = 130$

Step - 1 We take $59 > 13$, so divide 59 by 13.

Write the multiplication table of 13 till you get product just less than or equal to 59.



$13 \times 4 = 52$, $13 \times 5 = 65$ and $52 < 59 < 65$.

So, we take $13 \times 4 = 52$.

13 divides 59 for four times.

Write 4 for as first digit in the quotient.

Then write the product 52 below 59 and subtract.

We get 7.

Step - 2 Bring down the digit 8 from ones place and write next to 7, so it becomes 78

Divide 78 by 13, $13 \times 6 = 78$

write 6 as second digit in the quotient. Write 78

below 78 and subtract.

$78 - 78 = 0$ write 0 as remainder.

Example - 4

Ravi distributed 876 rupees to 38 students equally for purchase of class room decoration items. Calculate how much amount each one will get and what amount will remain with Ravi.

Data:

Total amount to be distributed equally

$$= \dots \dots \dots$$

Number of students

$$= \dots \dots \dots$$

Amount each will get

$$= \dots \dots \dots$$

What operation is required here ?

Here we need to divide 876 by 38.

$$38) 876 (23$$

$$\underline{-76}$$

$$116$$

$$\underline{-114}$$

$$2$$

$38 \times 0 = 0$

$$38 \times 1 = 38$$

$$38 \times 2 = 76$$

$$38 \times 3 = 114$$

$$38 \times 4 = 152$$

$$38 \times 5 = 190$$

$$38 \times 6 = 228$$

$$38 \times 7 = 266$$

$$38 \times 8 = 304$$

$$38 \times 9 = 342$$

$$38 \times 10 = 380$$



Do this:

- a) Find the quotient and the remainder for the following and check your answer.
- a) $309 \div 15$ b) $768 \div 19$ c) $422 \div 24$ d) $849 \div 42$
- b) A garment vendor packs 24 T-shirts in a box. If he had 886 T-shirts, how many boxes are required to pack and how many T-shirts would remain unpacked?

6.3 Dividing a number by 10

Now observe what happens when a number is divided by 10.

Example - 5

$$637 \div 10$$

$$\begin{array}{r} 10) 6\ 3\ 7(63 \\ \quad - 60 \\ \hline \quad 3\ 7 \\ \quad - 30 \\ \hline \quad \quad 7 \end{array}$$

Here quotient = 63 and remainder = 7.



Example - 6

Divide 480 by 10

$$\begin{array}{r} 10) 4\ 8\ 0(48 \\ \quad - 4\ 0 \\ \hline \quad 8\ 0 \\ \quad - 8\ 0 \\ \hline \quad \quad 0 \end{array}$$

Here quotient = 48 and remainder = 0.



Example - 7

Divide 908 by 10

$$\begin{array}{r} 10) 908 (90 \\ -90 \\ \hline 8 \\ -0 \\ \hline 8 \end{array}$$



What do you observe?

When we divide a 3-digit number by 10, the remainder is always the digit in one's place of the given number and the quotient is the number formed by the remaining digits.

Here quotient = 90 and remainder = 8.

6.4 Dividing a number by 100

Now observe what happens when a number is divided by 100.

Example - 8

$$967 \div 100$$

$$\begin{array}{r} 100) 967 (9 \\ -900 \\ \hline 67 \end{array}$$

Here the quotient = 9
and the remainder = 67

100 x 1 =	100
100 x 2 =	200
100 x 3 =	300
100 x 4 =	400
100 x 5 =	500
100 x 6 =	600
100 x 7 =	700
100 x 8 =	800
100 x 9 =	900
100 x 10 =	1000



Example - 9

$$\begin{array}{r} 709 \div 100 \\ 100) 709 (7 \\ \underline{-700} \\ \hline 9 \\ \hline \end{array}$$

Quotient = 7 Remainder = 9



Example - 10

$$\begin{array}{r} 900 \div 100 \\ 100) 900 (9 \\ \underline{-900} \\ \hline 0 \\ \hline \end{array}$$

Quotient = 9 and Remainder = 0.

What do you observe?

From the above examples, we observe that

When we divide a 3-digit number by 100, the quotient is the digit in the hundred's place and the remainder is the number formed by the digits in ten's and one's place of the given number taken in the same order.

Example - 11 $614 \div 100$ Remainder = 14; Quotient = 6

$721 \div 100$ Remainder = 21, Quotient = 7

Do this:

Guess the remainder and quotient without actual division.

- a) $649 \div 10$ b) $989 \div 100$
c) $701 \div 100$ d) $683 \div 100$



Exercise 6.2

- Dasu needs 3 oranges to make a glass of orange juice. How many glasses of orange juice can be made with 240 oranges?
- The cost of a mango is ₹ 15. How many mangoes can be purchased for ₹ 210?

3. The earth takes 24 hours to complete one rotation. How many rotations can it make in 144 hours?
4. A school bus can accommodate 50 children. How many such buses are needed to accommodate 250 children?
5. 160 children get into teams of 4. How many such teams can they form?
6. How many weeks make 126 days?
7. Sanju bought 360 crayons in packets of 15 each. How many packets of crayons did Sanju buy?
8. Fill in the missing digits in the division and find the quotient and the remainder

a) $56) 916(1 \square$

$$\begin{array}{r} \boxed{} 6 \\ \hline \boxed{} 5 6 \\ - \boxed{} \boxed{} 6 \\ \hline 2 0 \end{array}$$

Quotient = Remainder =

b) $44) 625(1 \square$

$$\begin{array}{r} - 4 \square \\ \hline \boxed{} 8 5 \\ - 1 7 \square \\ \hline \boxed{} \end{array}$$

Quotient = Remainder =

9. Rani did the problem in the following way.

$19) 398(2$

$$\begin{array}{r} - 3 8 \\ \hline 1 8 \end{array}$$

Quotient = 2 Remainder = 18

Is it correct? Justify.



10. A small scale industry made 750 candles in a week. The candles were packed in a packet of 12 each. How many packets were made and how many candles were left behind.

6.5 DMAS RULE

Rama answered $3 + 5 \times 4 = ?$ like this

$$= 3 + 5 \times 4$$

$$= 8 \times 4$$

$$= 32$$

Who is correct? Think and discuss.

To find the correct answer, we follow **DMAS** rule.

DMAS is an acronym in which

D- Division \div

M-Multiplication \times

A-Addition $+$

S-Subtraction $=$

It explains the order of operations to solve a problem involving addition, subtraction, multiplication and division.

According to **DMAS** rule if an expression contains the 4 operations, first we have to perform Division followed by Multiplication, Addition and Subtraction.

Example - 12

Simplify the following.

$$14 + 26 - 27 \div 3 \times 2$$

(Apply DMAS rule)

Step - 1 We perform the division first.

$$\text{i.e. } 27 \div 3 = 9$$

Now it becomes,

$$14 + 26 - 9 \times 2$$

Ravi answered $3=5\times 4?$ like this

$$= 3 + 5 \times 4$$

$$= 3 + 20$$

$$= 23$$



Step - 2 Now the operation is multiplication .

i.e. $9 \times 2 = 18$

Now it becomes,

$$14 + 26 - 18$$

Step - 3 Next operation is addition.

i.e. $14 + 26 = 40$

Now it becomes,

$$40 - 18$$

Step - 4 Next operation is subtraction.

Now we get $40 - 18 = 22$

So the answer is 22.



Try this:

$$7 + 7 \div 7 + 7 \times 7 - 7 =$$

Exercise 6.3

Do the following.

1. $168 \div 8 + 5 \times 12 - 38$
2. $412 - 108 + 315 \div 45 \times 157$
3. $476 \div 14 \times 24 - 504 + 132$
4. $482 - 412 + 276 \div 12 \times 204$
5. $128 + 125 \div 25 \times 26 - 127$



7.1 Introduction

On a Sunday some students are going to play in a ground. On their way they stopped at carpenter Brahmam's shop. There they observed a lot of objects made by the carpenter.



They requested the carpenter to show the articles. Carpenter Brahmam showed them and explained the details of all the articles made by him in the shop.

Meanwhile, Rani observed a box in the shop.

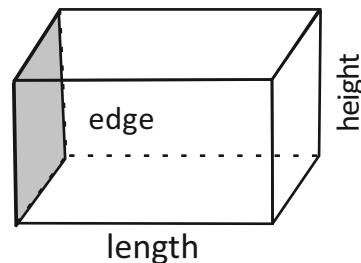
Look at the box. This box is having 12 edges, 8 corners and 6 faces



Rani

CORNER vertex

face



My rubric cube is also having 12 edges 8 corners and 6 faces



Rajia



The shape is just like joker cap.



Kittu

Hey! Look at the legs of teapoy. What do we call this shape?

Mary



This shape is called a cone.



What is the shape of this gum bottle?



This shape is called a cylinder.

Think and discuss

Does a cone or cylinder have any edges and corners?

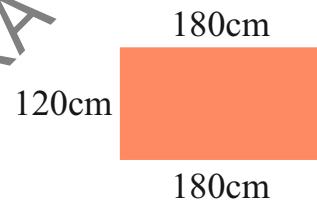
7.1 Rectangle:

Children observed the cot made by Brahmam. The plywood used for the top of the cot is in this shape.

Jyothi too observed the shape of the plywood sheet and measured, then the lengths of all edges. Brahmam helped Jyothi in measuring the plywood sheet. From the measurements, she noticed that the opposite edges have the same length. Adjacent edges (sides) have different lengths.



This shape is called Rectangle



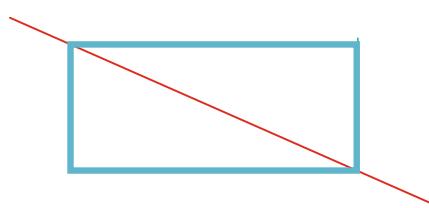
Jyothi measured like this.



Rani drew a line on a rectangular paper as given below. Now, the rectangle is divided into two equal parts.



Rajia drew a line on another rectangular paper joining the opposite corners to make the rectangle into two equal parts



Do this:

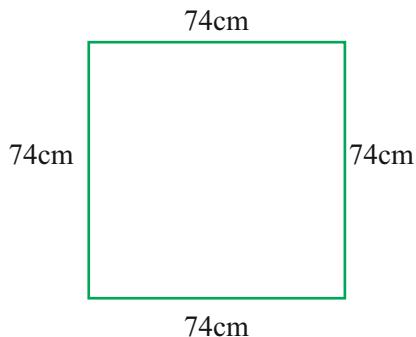
- Draw a line to divide the adjacent rectangles into two equal parts.
- Name some objects which are in rectangle shape



7.2 Square :

Children were discussing the shape of carrom board kept in the carpenter's shop.

Rani measured each length of carom board. She found that each length is 74cm.



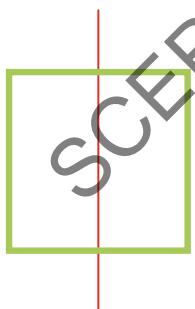
This carroms board has 4 edges. All are equal in length. The edges are vertical to each other



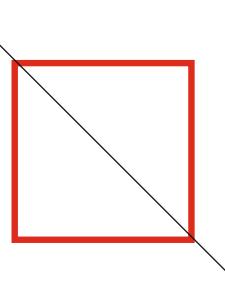
This shape is called a **SQUARE**.
The edge is also called a side and
all the four sides are equal.



Mary drew a line on a square paper as shown below. Now, the square divided into two equal parts.



Kittu drew a line on another square paper joining the opposite corners to make the square into two equal parts equal parts.



Do this:

Draw a line to divide the following squares into two equal parts.



Activity - 1:

Measure the sides of the objects and record them in the table given below. Write your observations in last column.

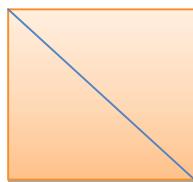
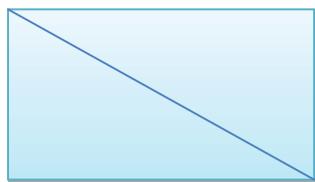
Shape of object	Name of the object	Lengths of opposite sides	Lengths of adjacent sides	Property
Rectangular	Maths Text book	1 st pair:cm, cm 2 nd pair:cm, cm	1 st pair:cm, cm 2 nd pair:cm, cm	1) side are equal 2) sides are unequal 3) sides are vertical
	Note book cover page	1 st pair :cm, cm 2 nd pair:cm, -----cm	1 st pair:cm, cm 2 nd pair:cm, cm	
Square	One face of a rubric cube	1 st pair:cm, cm 2 nd pair:cm, cm	1 st pair:cm, cm 2 nd pair:cm, cm	1) side are equal 2) sides are vertical
	One face of a die	1 st pair:cm, cm 2 nd pair:cm, cm	1 st pair:cm, cm 2 nd pair:cm, cm	

Activity - 2:

7.3 Triangle:

Take a card board and cut it in the shapes of a square and a rectangle.

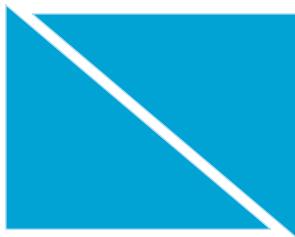
Fold them as shown below.



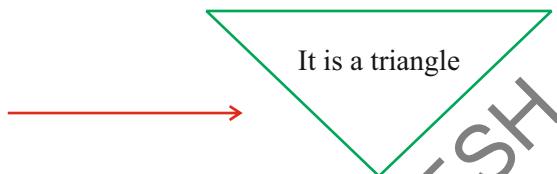
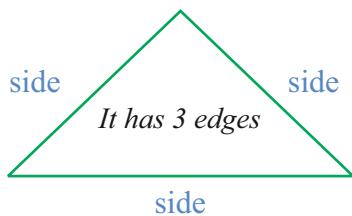
The line drawn through the corners of a rectangle or a square is called its diagonal.



If you cut the shapes along the crease. You get two equal shapes as shown in the figure.



Observe these shapes.



Do this:

- How many triangles are formed when a square or rectangle is cut diagonally?
- In a figure, the four sides are 20cm, 16cm, 20cm, 16cm then what is the shape of the object?
- In a figure, measurements of four sides are 15 cm each and the adjacent sides are vertical to each other. What is the shape of the object?

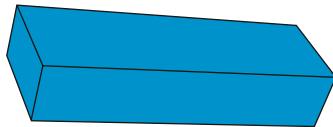
7.4 Nets of 3-D object:

Collect some cartons of tooth paste and chalk pieces.

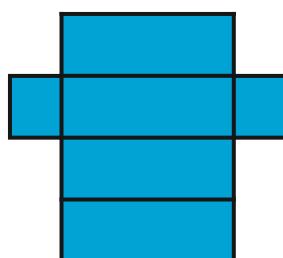
Cut and unfold them completely.

We find the shape as shown in the figure.

Identify the combination of shapes.

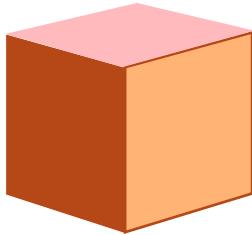


Empty toothpaste box

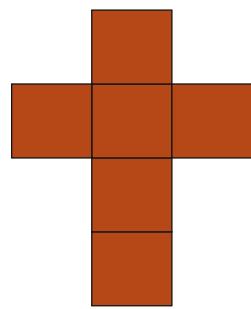


Unfolded toothpaste box / net

Unfold the chalk piece box carefully and you will get this shape. What do you observe in this unfolded shape?



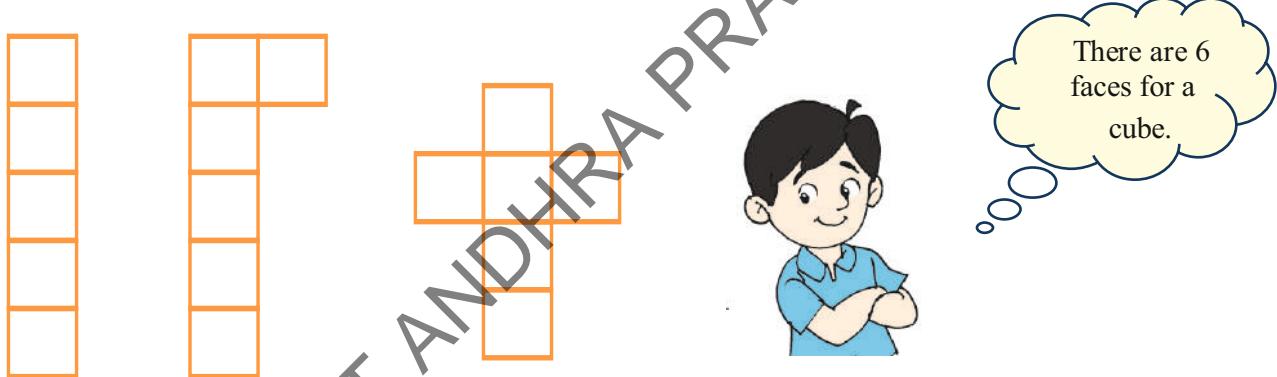
Empty chalkbox



Unfold chalk-box / net

By folding this shape along the creases carefully you get the shape of a chalk piece box again.

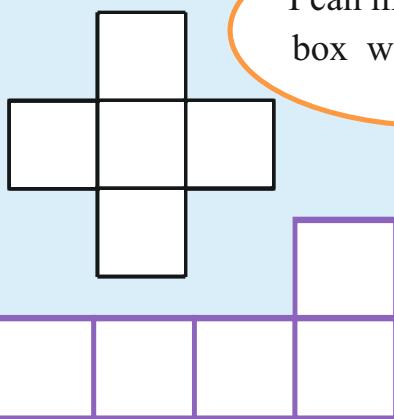
Rafi wanted to make a cube with a card board. He knew that all the faces of a cube are equal. So he took a cardboard and set it into different shapes to fold them into a cube.



Select a net from the above to make a perfect cube from the above net forms.

Do this:

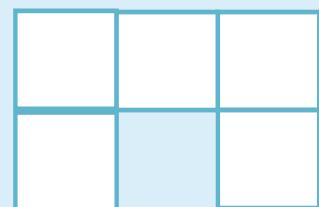
1) Observe the following.



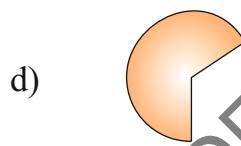
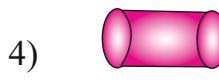
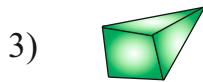
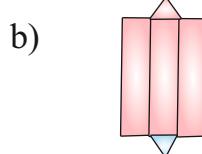
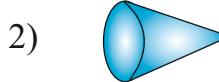
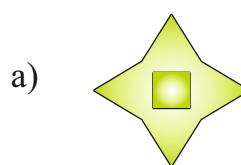
I can make an open box with these net forms



I cannot make an open box with these net forms



2) Observe the net shapes of the boxes and match them with their 3-D shapes.



7.5 Perimeter:

A pandal was erected in front of Raju's house on the occasion of his brother's marriage. He wanted to decorate it with a "Thoranam" a string around it. So, he has to measure the four sides of the pandal to collect string of required length.



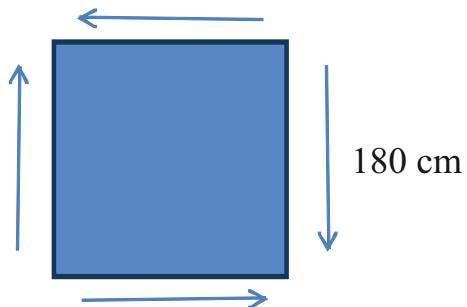
Raju measured all the four sides of the pandal on the ground. He found the lengths of four sides as 12m, 10m, 12m and 10m.

So, the total length of thoranam required = the length of four sides

$$\begin{aligned} &= 12 \text{ m} + 10 \text{ m} + 12 \text{ m} + 10 \text{ m} \\ &= 44 \text{ m} \end{aligned}$$

Perimeter is the total length of all sides of a shape.

Example : Somesh purchased a square carpet. Its side is 180 cm. He wanted to attach a Ribbon of good design along its sides. Find the length of the ribbon required.



We need to find the total length of all sides of carpet.

Length of the first side = cm

Length of the second side = cm

Length of the third side = cm

Length of the fourth side = cm

Total length of 4 sides = cm

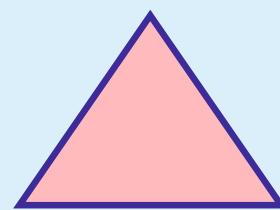
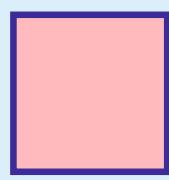
So, the perimeter of the carpet = cm.

Therefore, the length of ribbon required = cm



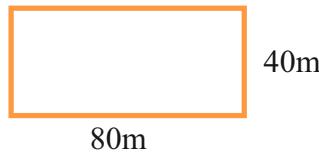
Try this:

Make some squares, rectangles and triangles with some cool drink straws. Find the perimeter of the shapes.

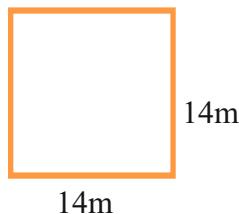


Exercise 7.1:

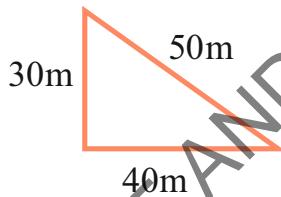
- 1) The length and breadth of a rectangular field are 60m and 40m respectively. If Somaiah walked around the field, then find the distance covered by him.



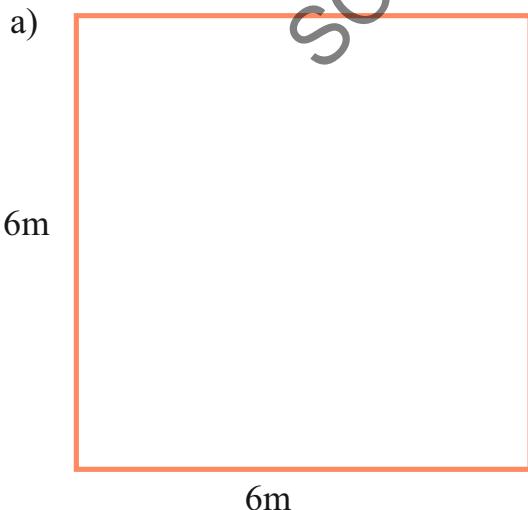
- 2) Somulu's site is in square shape. He wanted to construct the compound wall around it. Find the length of the compound wall.



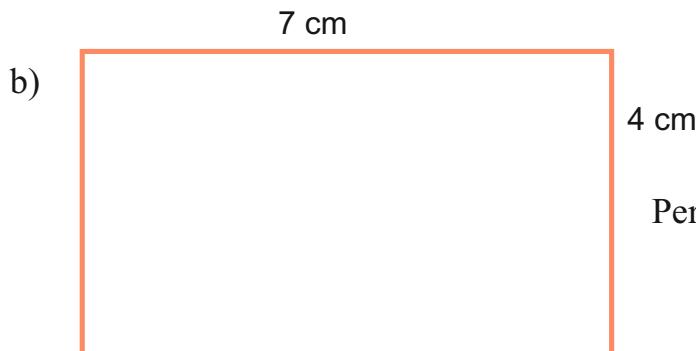
- 3) A park is in a triangular shape as shown below. What is the perimeter of the park?



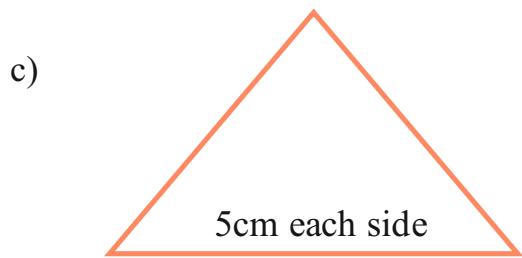
- 4) Find the perimeters of the following figures.



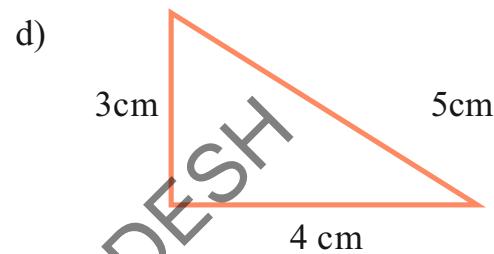
Perimeter = cm



$$\text{Perimeter} = \dots \dots \dots \text{cm}$$



$$\text{Perimeter} = \dots \dots \text{cm}$$

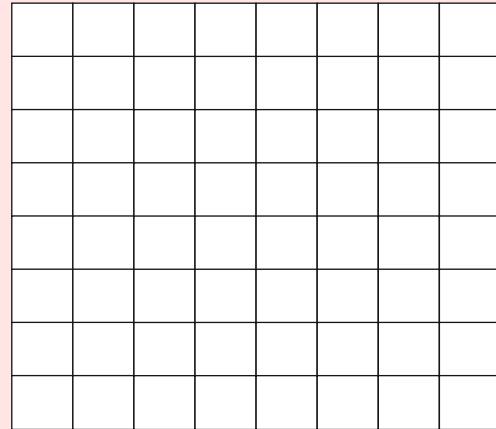


$$\text{Perimeter} = \dots \dots \text{cm}$$



7.6 Finding the perimeter using a grid paper

Ravi and Rama are drawing various shapes on the centimetre grid paper.

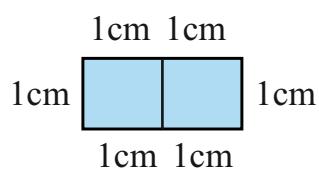


In this grid sheet all the grids/boxes are in the shape of a square with side 1 cm.



Thus the perimeter of each grid is 4 cm (1cm+1cm+1cm+1cm)

In a sample grid paper take two consecutive squares and colour them.



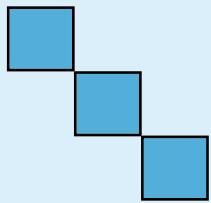
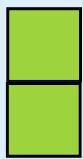
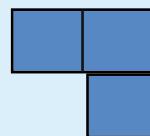
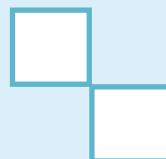
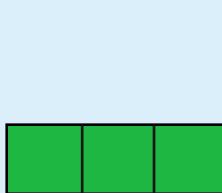
Yes, the shape is a rectangle with length 2 cm and breadth 1 cm

Let's calculate the perimeter of this rectangle.

The perimeter of the rectangle = $(1\text{cm}+2\text{cm}+1\text{cm}+2\text{cm})=6\text{ cm}$

Do This:

Find the perimeter of the given shapes



7.7 Area



Students count the number of tiles on the floor of their classroom.

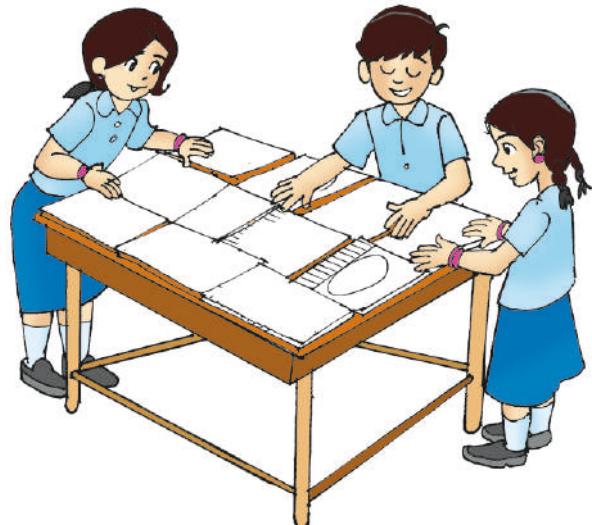
Students have counted a total of 100 tiles on the classroom floor.

The place occupied by the floor = 100 tiles.

We call this **area** of the floor = 100 tiles



Students have arranged square shaped papers (of the same size) on the table to calculate its surface area. It is observed that the table has taken 20 papers and the area is 20 square sheets.



Students of MPPS ,
Vizag decided to grow
vegetables and flowering
plants in the school
garden. They have
cleaned, levelled and
graded a small part of the
land in school. They have
planted seeds.



Now, the entire place where the seeds were planted for growing plants is called the “area of that land”.

7.8 Finding the area using a grid paper

The length and breadth of each grid on the centimetre grid paper is **1 cm**

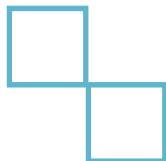
Each grid on the grid paper is called a square.



The area of each grid on a grid paper is called **1 square unit**.

Thus, the area of each grid is equal to 1 square unit.

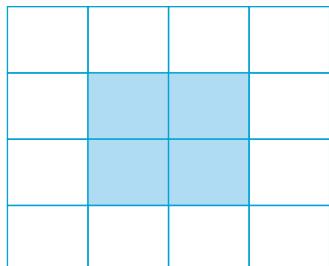
Task: On a grid paper, colour two grids to form different shapes.



Now, calculate the areas of the shapes formed. What do you observe?

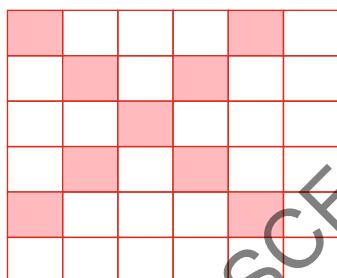
Do This:

Calculate the area of the shapes formed by colouring three, four and five grids.



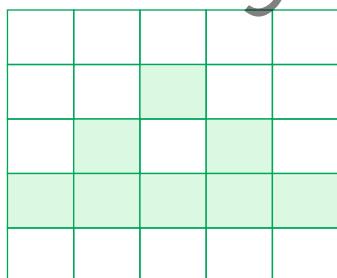
This figure occupies 4 grids.

Hence its area = 4 square units



This figure occupies 9 grids.

Hence shaded area = square units



This figure occupies grids.

Hence its area = square units

Try this:

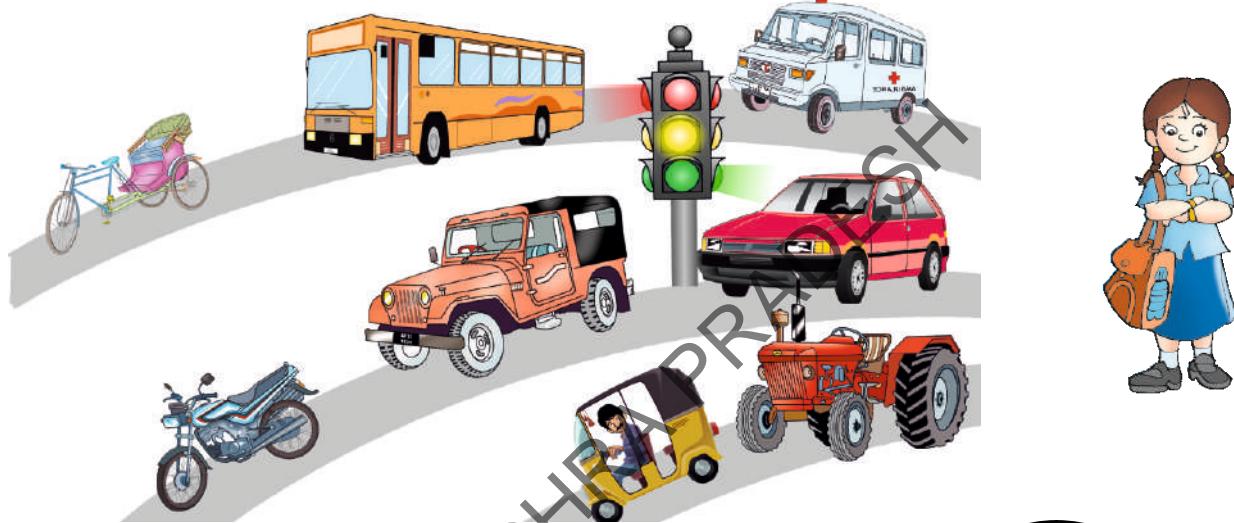
Find the area and perimeter of each shaded shape in the above pictures. What do you notice?

Exercise 7.2

1. On a grid paper, draw different shapes totalling to an area of 8 square units.
2. Draw a rectangle of 4 units length and 3 units breadth on a grid paper. Also, calculate its area.
3. Draw a square of side 5 units on a grid paper and calculate the area.

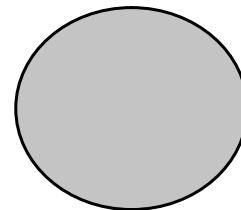
7.9 Circle:

One day, Ravi and Karuna observed the wheels of the vehicles moving on the road.



You would have also noticed the wheels of different vehicles.

What is the shape of a wheel? If you draw a line around it, then, the shape will be like this.



Have you ever noticed the shape of a bangle?

Place a bangle on a white paper and draw a line around it. What is the shape you have drawn?

Draw the outlines of different sized bangles and observe the shapes.

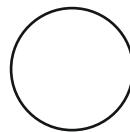
Place different coins on the paper and draw the outlines. What shape you have drawn?

Name some objects of  shape

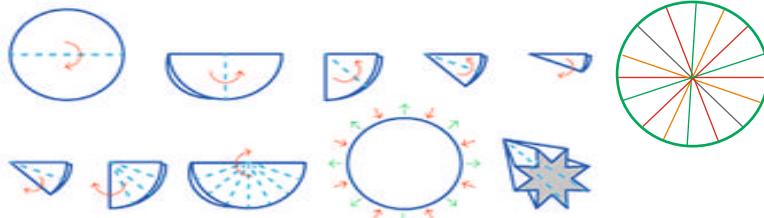
Can you draw this shape using a thread?

These things like wheels, bangles etc. are round shaped.

Task: Take a round plate and draw an outline around it. Cut along the shape. **Its a circle.**



Now, fold the cut paper making the circle into two equal parts. Fold it again in the half for two more times till you get the shape given below.

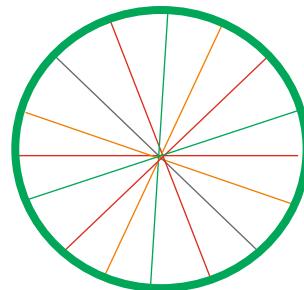


The last shape is like this.

Now, unfold the paper to see a full circle.

Now, cut the paper along the lines and keep all the pieces together.

Now, measure the length of straight edges of one of the pieces.

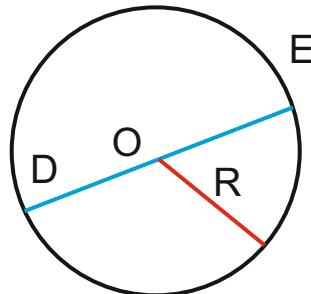


Similarly, measure the lengths of the straight edges of all the pieces.

Have you notice all these lengths are equal in length?

This length is called the "**radius of the circle**"

The point at which all the lines meet is known as the "**centre of the circle**"



Now, place a thread along the boundary of a circle and measure its length by a scale.

This length is called the “circumference of the circle”.

Do this:

- Draw a few circles using a bangle, plate, bottle cap etc.
- Draw circles using one- rupee, two- rupee, five- rupee and ten- rupees coins.



7.10 TANGRAM

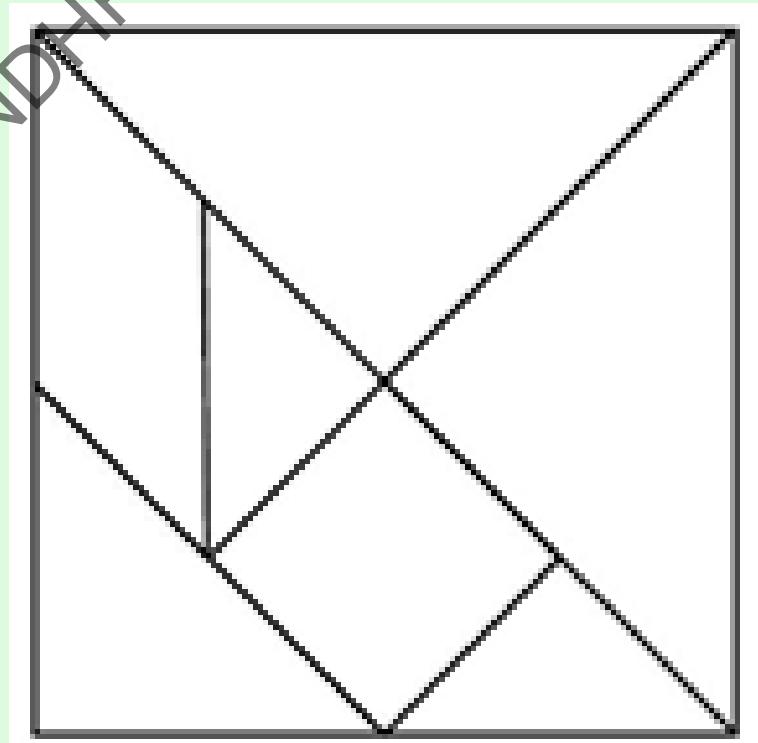
Students! Have you ever seen a Tangram?

Tangram is a puzzle. It consists of 7 flat shapes, which are called “tans”. They are put together to form different shapes.

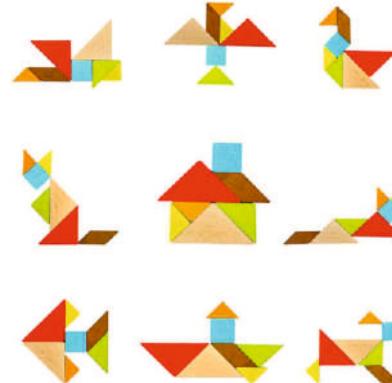
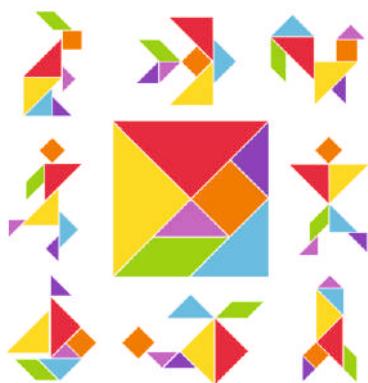
Let's see how to make a Tangram.

- Take a square grid paper and draw the lines as shown in the adjacent figure.
- Cut along the lines drawn on it.
- You get 7 pieces of different shapes.
- This set of pieces is called “TANGRAM”.

All parts of the Tangram are used to make different shapes.



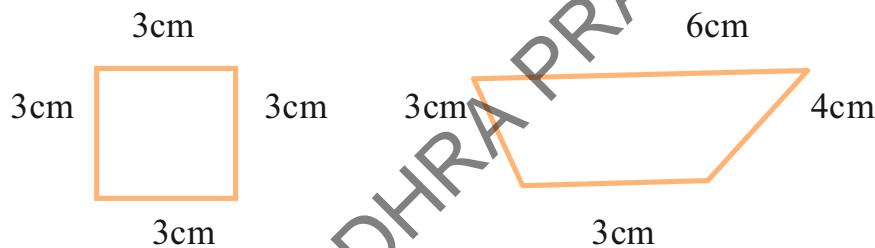
Now, let's try making different shapes using the pieces of Tangram.



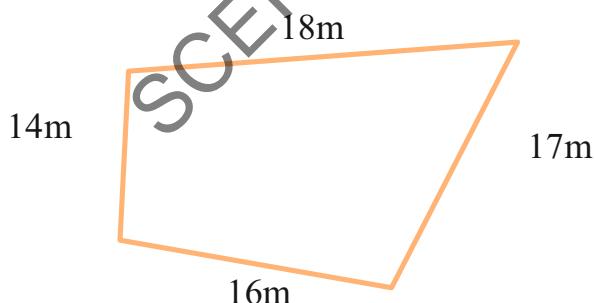
You compare and observe the shapes made by you and your friends.

Exercise 7.3

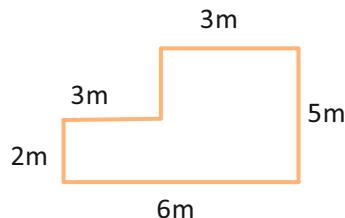
1. What is the perimeter of the following figures?



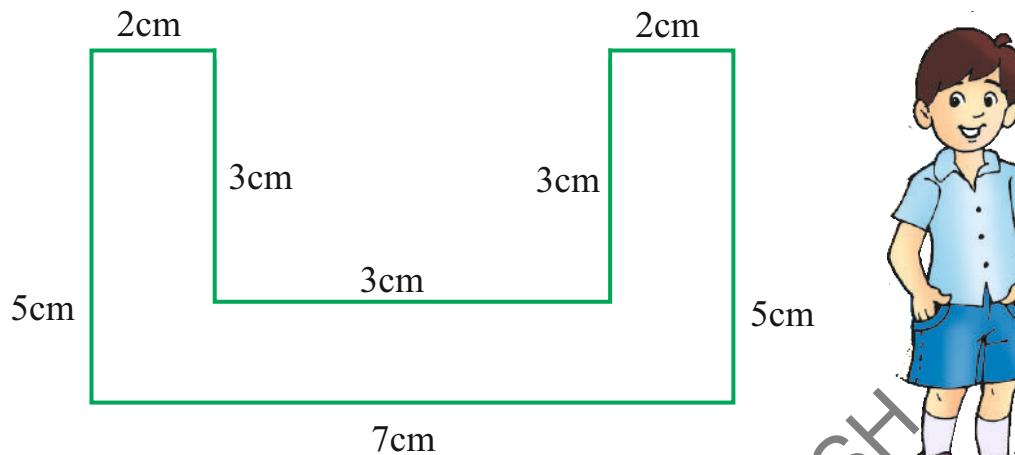
2. A piece of land in Simhachalam is in the following shape. Find the length of the fencing wire required to provide fencing around the land.



3. The perimeter of the following shape is _____ Metres



4. What is the perimeter of the figure?



5) What is the perimeter and area of figures given below.

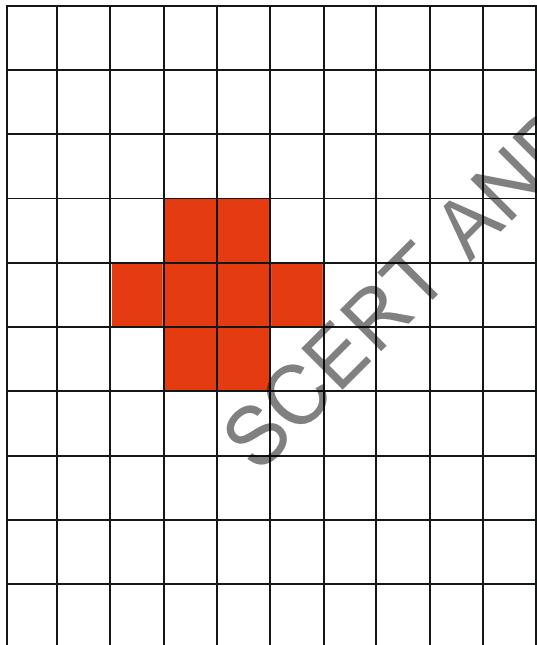


Fig:1

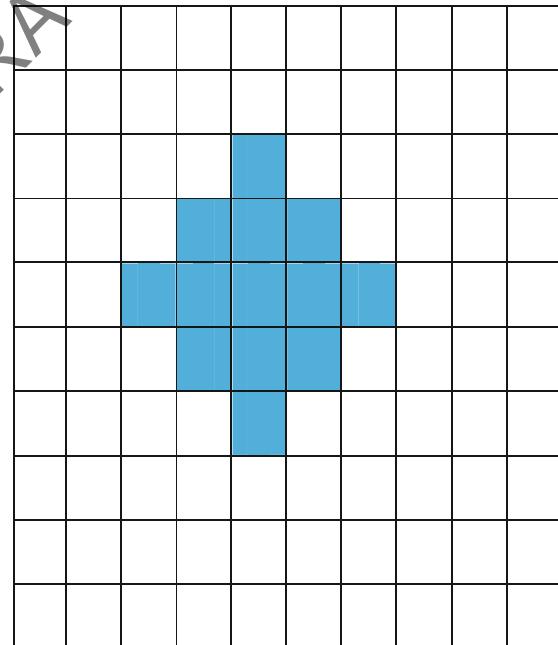
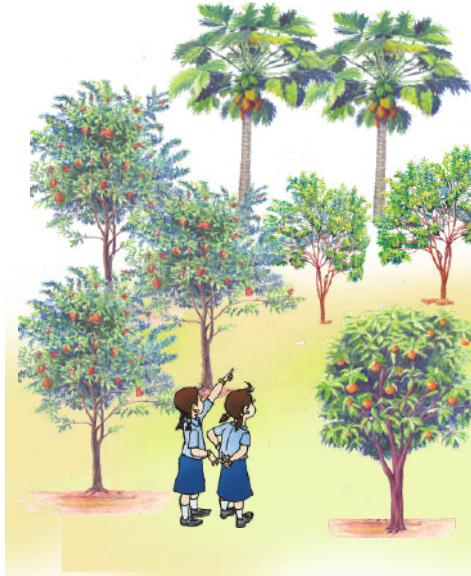


Fig:2



● **8.0 Introduction**

Observe the following pictures



- * What do you see in the picture?
- * How many trees are there? What trees are these?
- * How do you count the number of trees of each type?

If one goes on counting orange trees in first round, mango trees in the second round and so on, then one needs to go around the garden for 6 times. It is a lengthy and laborious process. Instead of going around the garden for six times the counting can be done in a single round if we make tally table.

For instance, if we see an orange tree we write one tally mark as | in the table against orange. Similarly for two trees we write - ||

for three trees - |||

for four trees - ||||

for five trees we write - |||||

Now, complete the table by using the above picture.

Tree	Tally marks	Number of trees
Orange	II	2
Mango		3
Guava		4
Pomegranate		3
Papaya		2
coconut		1

Data collection and interpretation :



What colour do you think is most liked by your class 4 pupils?

Harshitha wanted to find out which colour is mostly liked in her class. So, she talked to her 40 classmates and recorded the information about colours they like most.

The data reads as follows:

Red	Green	Pink	Black	Brown	White	Green	Red	White	White
Black	Black	Pink	Blue	Pink	Green	Brown	Pink	Green	Green
Red	Pink	Blue	Pink	Pink	Green	Blue	Black	White	Brown
Blue	Red	Red	Red	Pink	Green	White	Pink	Pink	Green

8.1 Table with more than five Tally marks

Is it easy to say the most liked colour of class 4 from this information? It becomes easy if we organise the collected information i.e. data in a tabular form.

Colour	Number of times repeated/tally marks	Number form
Red		6
Green		8
Pink		10
Black		4
Brown		3
White		5
Blue		4
Total		40



Now we can easily say what colour is mostly liked by the class. Yes, pink is the mostly liked colour in the class. What is the least liked colour in the class?

Do this:

Observe the two tables and write the number for the given tally marks, and tally marks for the numbers.

Event	Tally marks	Number
a		
b		
c		
d		
e		
f		

Event	Tally marks	Number
a		4
b		5
c		9
d		12
e		15
f		8

Try this:

Balu has saved ₹ 1, ₹ 2 and ₹ 5 coins in his kiddy bank. Now his kiddy bank is full and he wanted to count the number of each coin separately. How will he do this in an easy way?

8.2 PICTOGRAPH

Sheela wants to find which fruit picture is collected least in number by the children in the class 4. To obtain the information what question should Sheela ask her friends?

	4
	6
	3
	9
	7
	5
	2
	8
	6
50	



Instead of writing the name of the fruit she started drawing its picture like this.

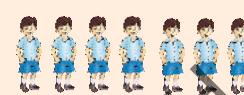
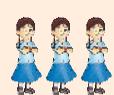
Then she classified the collected information as follows.



From the above arrangement, it is easy to determine which fruit picture collected least in the class is ... Also the more fruit picture collected is...

8.3 Reading a pictograph

Look at the following data. The data is about the number of children who have taken their mid day meal at an anganwadi centre.

Age of the child	Number of children taken meals at Anganwadi		Pictures	
	Boys	Girls	Boys	Girls
3+	4	6		
4+	7	3		
Total				

Do this:

Collect the necessary information to find the most favoured flower/ vegetable of your class.
Represent the data in a) tabular form b) pictograph.

Suppose there are 300 students in a school. Now, to represent the number of children who opted for MDM at school, in a pictograph, it is not easy to draw 300 pictures to represent all the students. In such a case, where the number of observations is more we introduce 'scale' in the pictograph. A scale is a convenient way to represent the information precisely.

We take or draw one picture for every 5 or 10 or so as per the convenience. For example observe the following data. It is about the number of ice-cream bars sold during a week.

Day	Number of ice cream bars sold
Monday	50
Tuesday	40
Wednesday	60
Thursday	80
Friday	50
Saturday	30

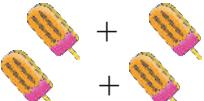


For the sake of convenience we take/represent 10 ice cream bars by a single picture.

$$10 \text{ ice-cream bars} = \text{ }$$



$$20 \text{ ice-cream bars} = 10 \text{ bars} + 10 \text{ bars} = \text{ }$$



$$30 \text{ ice-cream bars} = 10 \text{ bars} + 10 \text{ bars} + 10 \text{ bars} = \text{ } + \text{ } + \text{ } \text{ and so on.....}$$

Now the above information shown in the table can be represented in a pictograph as follows.

Scale:  = 10 ice-cream bars

Day	Number of ice cream bars							
Monday								
Tuesday								
Wednesday								
Thursday								
Friday								
Saturday								

From the Pictograph :

- * The day on which maximum number of ice cream bars were sold is
- * The day on which minimum number of ice cream bars were sold is.....
- * Total number of ice-cream bars sold during the week.....

Do this:

The following pictograph depicts the types of household in a street of Unnava village. Observe the table and complete it.

- In Unnava village three types of houses are there in street. Number of houses of each type is in the table given below. Fill the table using tally marks.

Type of house	Number of house holds
	
	
	

Try this:

- Below is a pictograph showing the number of students of a class who liked different food items.

Food Item	Number of plates taken by the students of a class
Chapathi	
Dosa	
Idly	
Poori	
Vada	

By observing the above pictograph answer the following questions.

- How many students like dosa?
- Which food item is the least liked? How many students like it?
- How many students are there in the class?
- Which food item is the most liked? How many students like it?

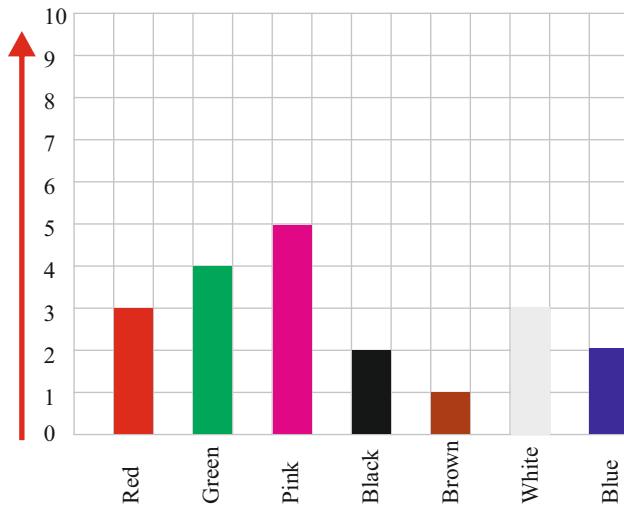
8.4 Reading a Bar graph:

Now consider the data given below.

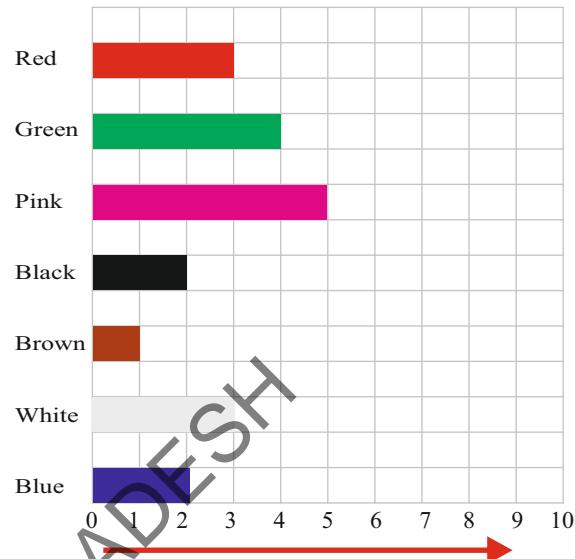
Colour of the dress	Number of times repeated
Red	3
Green	4
Pink	5
Black	2
Brown	1
White	3
Blue	2
Total	20



To make it more clear and interesting the above data can be represented in vertical bars or horizontal rectangular bars using rectangles. So the BAR GRAPH of the above data can be depicted as follows.



(OR)



Bar graph shows the most liked colour in class 4.

Example: There are six types of flower plants in the garden of M.P.P School, Kothapalem. The number of plants of each type is given below.

Plant	Number of plants
Mary gold	24
Hibiscus	18
Rose	15
Chrysanthemum	27
Jasmine	9
Lily	15



The bar graph for the above information can be drawn as follows.

The maximum number of plants here is chrysanthemum.

If we denote the number as it is like this in the bar graph, the graph becomes big in size.

Therefore, we show this information by taking a convenient scale.

The above numbers can be represented as multiples of 3.

Let's take 1 box = 3 plants as the scale.

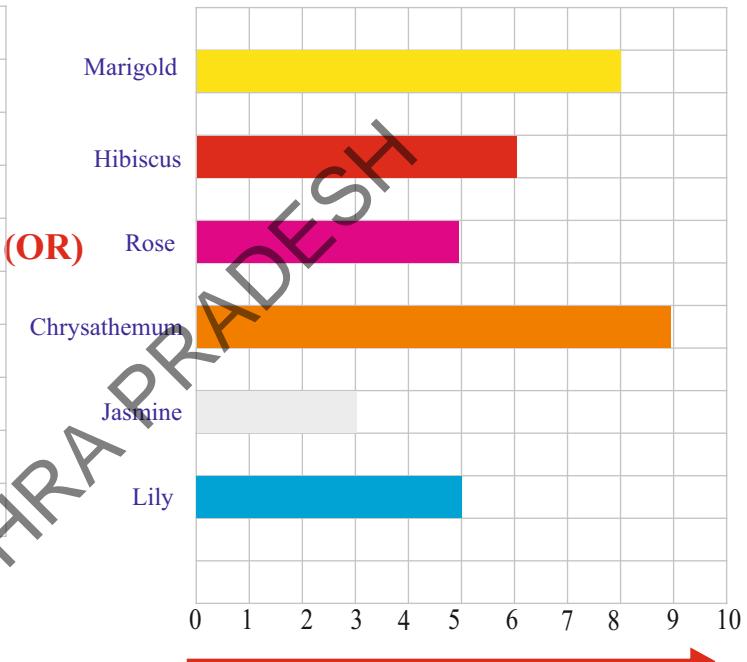
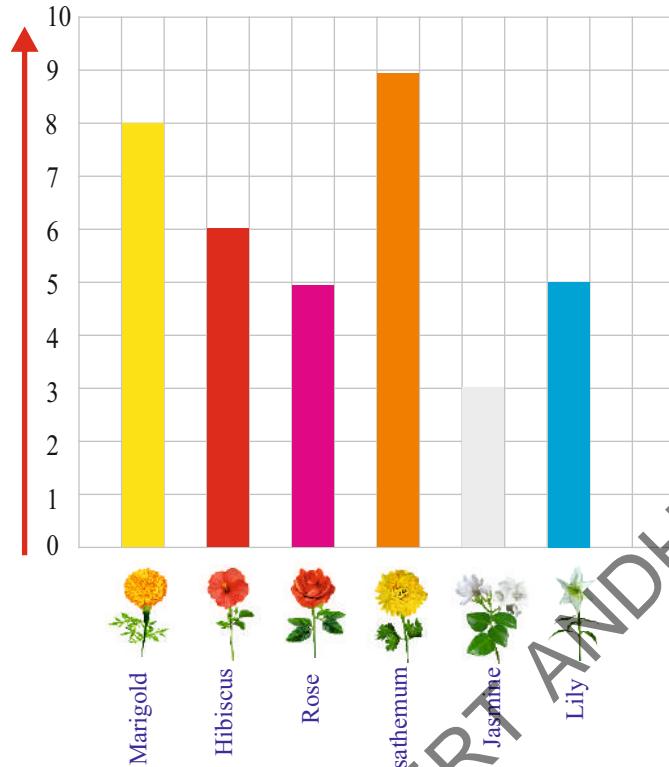
$$3 \text{ plants} = \boxed{}$$

$$6 \text{ plants} = 3 \text{ plants} + 3 \text{ plants} = \boxed{} + \boxed{}$$

$$9 \text{ plants} = 3 \text{ plants} + 3 \text{ plants} + 3 \text{ plants} = \boxed{} + \boxed{} + \boxed{}$$

$$12 \text{ plants} = 3 \text{ plants} + 3 \text{ plants} + 3 \text{ plants} + 3 \text{ plants} = \boxed{} + \boxed{} + \boxed{} + \boxed{}$$

and so on.....



The bar graph shows the number of flower plants in the garden of M.P.P. School, Kothapalem.

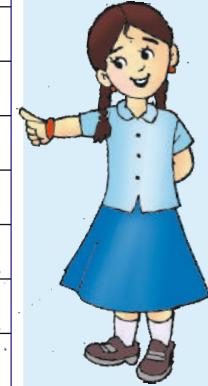
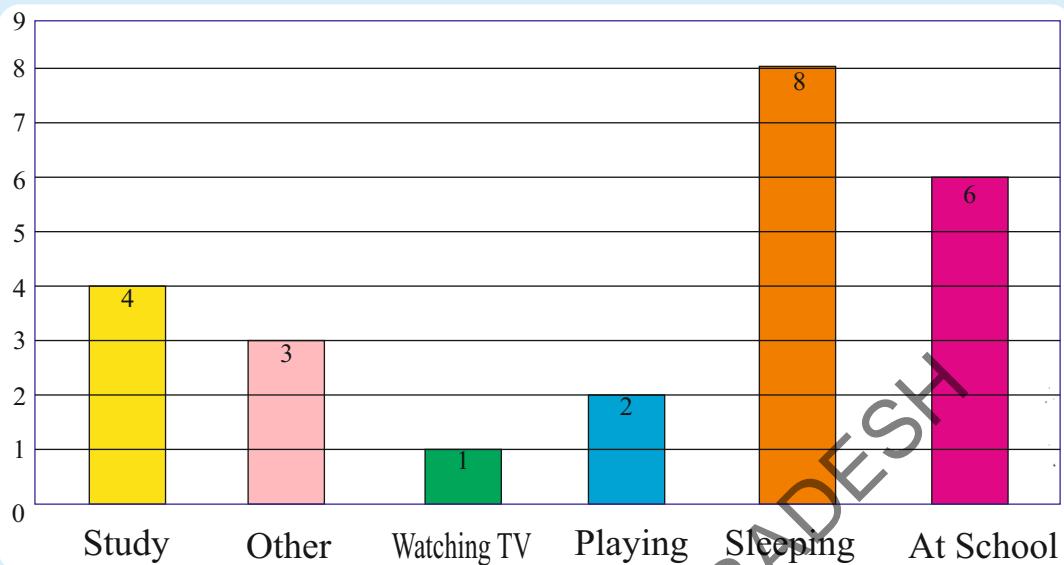
Answer the following from the above bar graph

- Number of jasmine plants = $\boxed{} + \boxed{}$
 $= 3 + 3 = 6 \text{ plants}$
- Number of lily plants = _____
- Number of marigold plants = _____

Do this:

- The bar graph shows how Kishore spends his time on a normal day.

Scale: 1 box = 1 hour



Answer the following questions based on the above bar graph.

- On which activity does Kishore spend more number of hours?
- How many hours does Kishore spend in sleeping and at school?
- On which activity does Kishore spend the least number of hours?
- What is the difference between the number of hours spent in sleeping and the number of hours spent at school?



Exercise - 8.1

- 30 children of class 4, expressed their pets in their homes as follows...

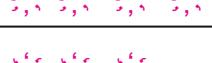
cat dog hen dog goat cat hen dog goat cat
 hen dog goat hen dog cat goat hen dog cat
 dog hen cat goat goat cat cat hen dog hen

Complete the table and answer the questions given below.

Pets	Tally marks	Number
Cat		
Dog		
Hen		
Goat		

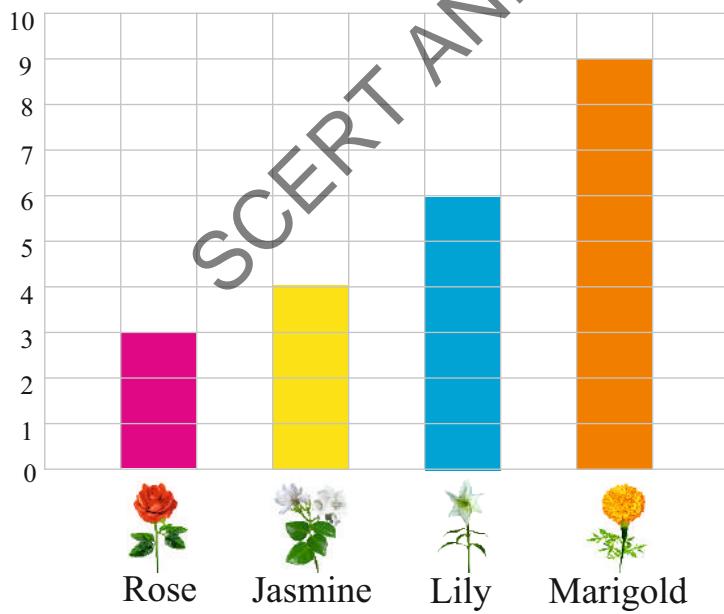
- a) Which is the most favourite pet ?
- b) How many children have hen as pet?
- c) How many children have dog as pet ?
2. The students have recorded the homes of the little creatures near their houses in the activity book.

One nest  = 5 homes

Name of the creatures	Homes of the creatures	Number of homes
Birds nest		
Birds tree holes		
Ant hills		
Spider webs		

- a) How many homes have they recorded in their activity book?
- b) Which kind of creature homes are same in number and how many?
- c) Which kind of creature homes are more than the others?
3. Observe the bar graph and answer the following. The bar graph shows the number of varieties of flowers used to make bouquets in a day by a flower vendor.

Scale: 1 box = 10 flowers



- a) How many roses are used in a day?
- b) Which flower is used the least?
- c) How many flowers are used totally?
- d) Which flower is used the most?

Maths lab activity:

- Note the number of students who got marks in maths ranging from 40 - 50 out of 50 and prepare a pictograph in your class.

Project :

- Sort out your school library books into categories like comedy, story books, picture books, moral books etc. How does it look like in a table with tally marks?
- Take a dice and throw it 50 times. Record your output at each throw of the dice, by drawing a tally mark in front of the number of dots you get. Make a table as shown below.

	Number of dots on the face of the die	Tally marks /number of times it appeared
1.		
2.		
3.		
4.		
5.		
6.		



- Which face of the dice did you get the least number of times?
- Which face of the dice did you get the most number of times?

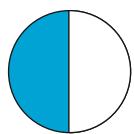


Fun Activity:

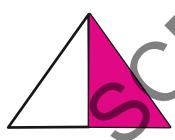
Can you classify the animals which are living on the ground nearby your house or school?

● **9.0 Introduction**

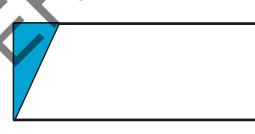
In the following picture pupils are participating in a painting competition. Can you identify pupils who have completed half?



Kishore



Naseema



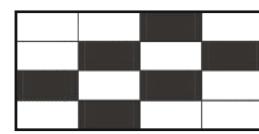
Balu



Gopika



Aditya



Mary

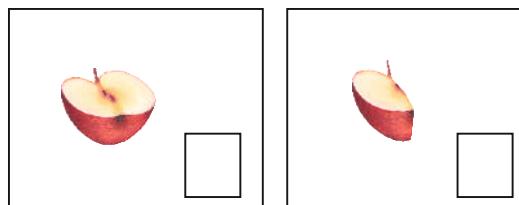
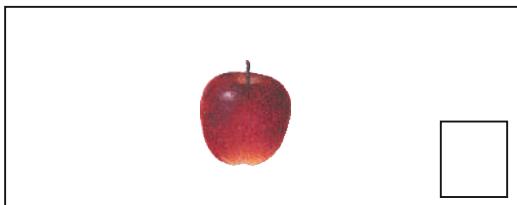
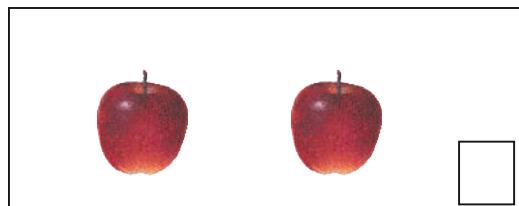
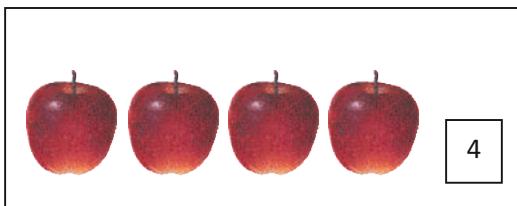
Now answer the following

- | | | |
|---|--------------|-------|
| a) Kishore has done half of the picture. | True / False | () |
| b) Aditya has done completely. | True / False | () |
| c) Balu has done half of the picture. | True / False | () |
| d) Gopika has completed the picture. | True / False | () |
| e) Mary has done half of the table. | True / False | () |
| f) Naseema has done half of the triangle. | True / False | () |



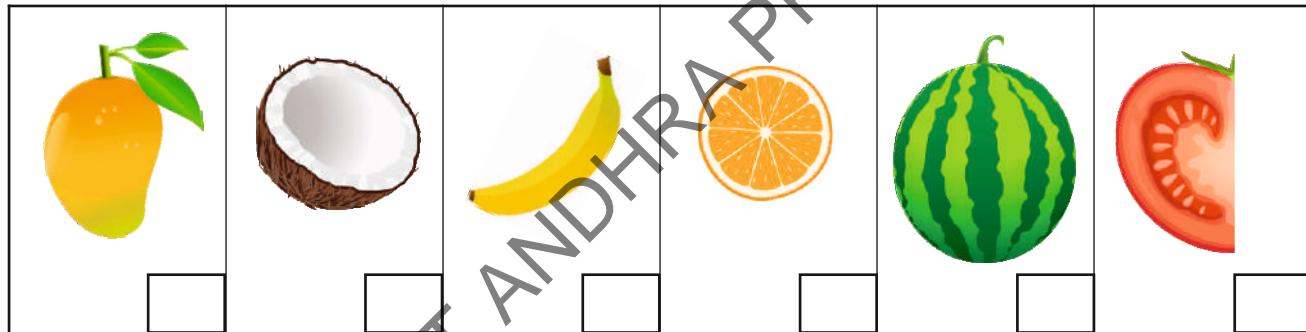
9.1 Half and Quarter

Write the numbers that denote the apples in the box.



You might have written half and quarter in the last boxes because the apple is not full. To represent a part of a whole we write it in a different way.

In the following, some pictures are shown as a whole and some in halves. Write 'W' for whole, 'H' for the half and 'Q' for the quarter.

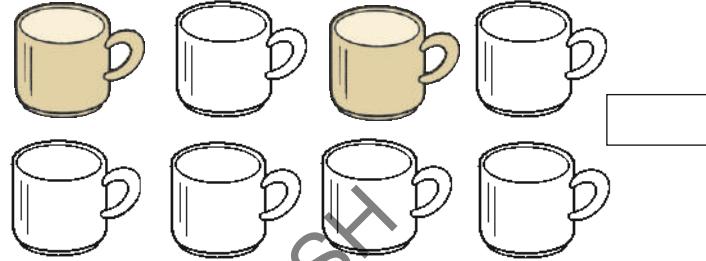
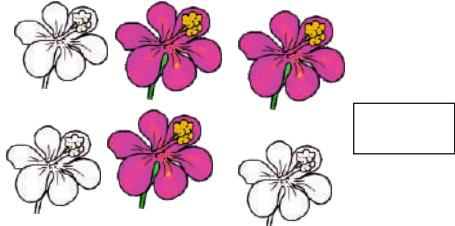
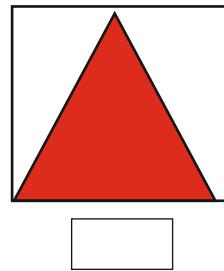
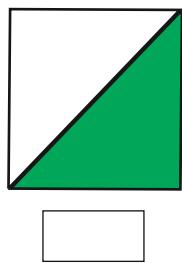
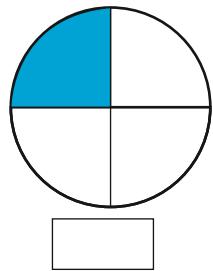


Look at the following figures. A complete picture and its half are given. Find the other half from the list to make picture into a complete one.

Whole	Half	Other half			

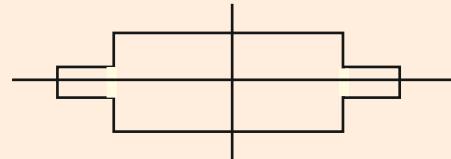
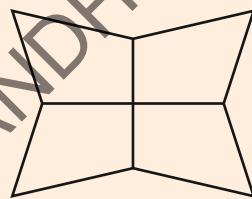
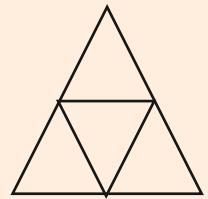
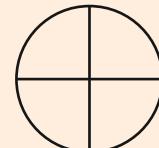
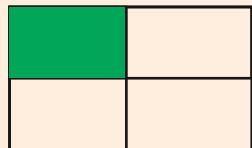


Observe the following. Label the shaded part as half and quarter.



Do this:

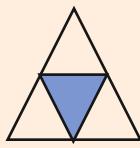
1. Shade one quarter of each of the following with a colour pencil. One is done for you.



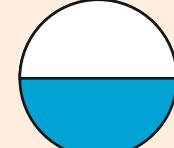
2. Write “half” or “quarter” in the boxes provided under each figures. One is done for you.



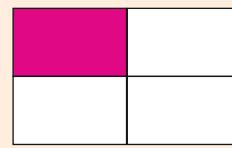
$$\frac{1}{2}$$



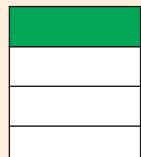
$$\frac{1}{4}$$



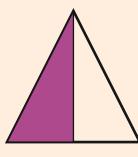
$$\frac{1}{2}$$



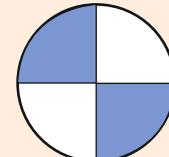
$$\frac{1}{4}$$



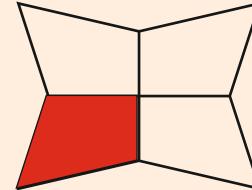
$$\frac{1}{4}$$



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



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



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

9.2 FRACTION

Observe the picture given below.

- How many circles are there?

There are 5 circles in all.

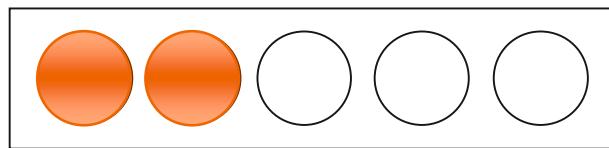
- How many circles are shaded?

Two circles are shaded.

We write this as a part of group or whole as $\frac{2}{5}$

The number which is written above the horizontal line is called the **numerator**.

Also, the number which is written below the horizontal line is called the **denominator**.



$$\text{Fraction} = \frac{\text{Numerator}}{\text{Denominator}}$$

Let us observe the following pictures and complete the table.

Picture	Total number of equal parts	Number of pictures / parts coloured	Part of a whole
	2	1	$\frac{1}{2}$
	3	1	$\frac{1}{3}$
	4	1	$\frac{1}{4}$
	5	2	$\frac{2}{5}$

	6	4	$\frac{4}{6}$
	3	2	
	8	5	

9.3 Understanding a Fraction

Let us represent “part of a whole” or “fraction” with some more pictures

Part of a whole	Pictures
$\frac{3}{4}$	
$\frac{1}{4}$	
$\frac{2}{3}$	
$\frac{5}{7}$	

What do you observe? By $\frac{3}{4}$ we mean that the total number of equal parts / units is 4 and the number of equal parts taken is 3.

So in $\frac{2}{3}$ total number of equal parts = 3

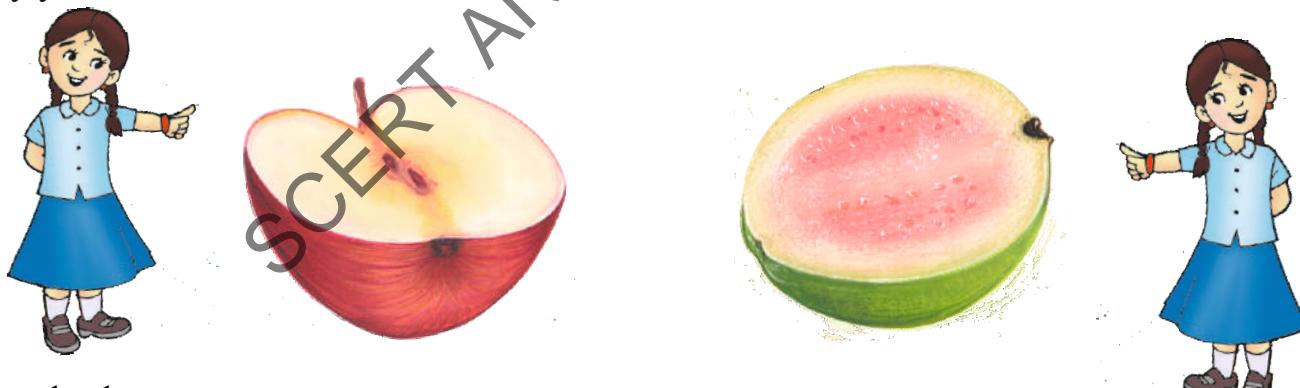
and the number of equal parts taken = 2

Do this:

- 1) In $\frac{3}{11}$, total number of equal parts or units is _____ and the number of equal parts taken is _____
- 2) In $\frac{3}{8}$, total number of equal parts or units is _____ and the number of equal parts taken is _____
- 3) In _____ the total number of equal parts are 8 and taken number of equal parts is 3.
- 4) In $\frac{2}{5}$, total number of equal parts or units is _____; the shaded number of equal parts is _____ and the number of unshaded parts is _____.

Activity

We can't see a fraction as two separate numbers, but as a part of the whole. Suppose Rani has exactly half a Guava, Sudha has half of an apple. Now what is the sum or total of these two halves ? Justify your answer.



Is $(\frac{1}{2} + \frac{1}{2})$ a whole ?

So a fraction doesn't tell about the nature of the object or group of objects under consideration but tells the quantity or part of the whole under consideration. By $(\frac{3}{4})$ we mean there are four equal parts of a whole, and 3 are taken (considered). Identify the numerator (shaded parts) and denominator (total units / parts) in the following fractions.

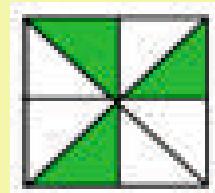
Fraction $\frac{2}{3}$ can be read as **2 over 3** or **2 out of 3** or **2 by 3**.

Fraction	Numerator	Denominator	Fraction in words	Read as
$\frac{1}{2}$	1	2	Half	1 over 2
$\frac{3}{4}$	3	4	Three fourths	3 out of 4
$\frac{6}{7}$			Six Sevenths	6 by 7
$\frac{2}{7}$				2 over 7
$\frac{2}{3}$				2 out of 3
$\frac{4}{11}$				4 by 11

Think & Discuss ↗

A student denoted the shaded part as $\frac{3}{5}$.

Is it correct? Justify your answer.



9.4 Unit Fractions

Look at the following pictures :

a)	Four horses are shown in a row.	$\frac{1}{4}$
b)	Three elephants are shown in a row.	$\frac{1}{3}$
c)	Seven rabbits are shown in a row. One rabbit is highlighted with yellow shading.	$\frac{1}{7}$
d)	Eight small cakes are shown in a row. One cake has a red cherry on top.	$\frac{1}{8}$
e)	Five lollipops are shown in a row. One lollipop is red.	$\frac{1}{5}$
f)	A flag divided into four equal quadrants. One quadrant is shaded red.	$\frac{1}{4}$
g)	A pie chart divided into three equal sectors. One sector is shaded purple.	$\frac{1}{3}$

The fractions represented by the above shaded parts are $\frac{1}{4}, \frac{1}{3}, \frac{1}{7}, \frac{1}{8}, \frac{1}{5}, \frac{1}{4}, \frac{1}{3}$

What do you observe in all the above fractions? How many parts or units are coloured in each of the above figures?

Single unit or one part is coloured.

Do you find anything in common for the above fractions?

Yes, The numerator is 1 for all fractions.

Fractions with numerator '1' are called UNIT FRACTIONS

So the unit fractions they represent are $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{7}$, $\frac{1}{8}$, $\frac{1}{5}$

Write some more unit fractions with denominator 2, 4, 6, 9.



Try this:

Write some unit fractions as you like

a)

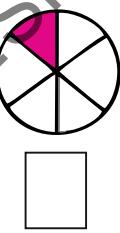
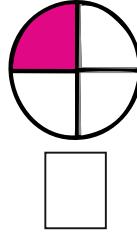
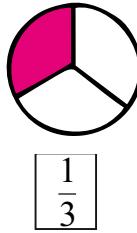
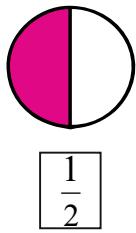
b)

c)

d)

9.5 Comparison of unit Fractions :

Can you write the fractions for the following shaded parts?



What do you observe from the above fractions $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$ and $\frac{1}{6}$

Numerators are same. Denominators are different.

By comparing above shaded portions. Clearly $\frac{1}{2} > \frac{1}{3}$, $\frac{1}{3} > \frac{1}{4}$, $\frac{1}{4} > \frac{1}{5}$, $\frac{1}{5} > \frac{1}{6}$

So, we have $\frac{1}{2} > \frac{1}{3} > \frac{1}{4} > \frac{1}{5} > \frac{1}{6}$ and $\frac{1}{6} < \frac{1}{5} < \frac{1}{4} < \frac{1}{3} < \frac{1}{2}$

Descending order

Ascending order

In any two fractions with same numerator, the fraction with smaller denominator is greater than the other and vice versa.

Thus we arrange them in ascending / descending order, according to the descending order/ ascending order of their denominators.

Do this:

1) Which is smaller $\frac{1}{3}$ or $\frac{1}{5}$?

2) Which is greater $\frac{1}{12}$ or $\frac{1}{10}$?

3) Circle the smallest fraction among $\frac{1}{7}$, $\frac{1}{3}$, $\frac{1}{9}$, $\frac{1}{2}$, $\frac{1}{6}$

4) Circle the greatest fraction among $\frac{1}{2}$, $\frac{1}{8}$, $\frac{1}{15}$, $\frac{1}{6}$, $\frac{1}{10}$, $\frac{1}{13}$

Try this:

Arrange the following in ascending order and descending order $\frac{1}{9}, \frac{1}{2}, \frac{1}{6}, \frac{1}{8}, \frac{1}{4}, \frac{1}{15}, \frac{1}{3}$

9.6 Like Fractions:

Look at the marks obtained by 4th class student of MPP School, Kothapalem in a school project.

Student Name	Teja	Krishna	Gopika	Bhavya	Bharath	David
Marks obtained	$\frac{3}{10}$	$\frac{8}{10}$	$\frac{7}{10}$	$\frac{9}{10}$	$\frac{4}{10}$	$\frac{6}{10}$

What do you observe in all the above fractions?

Numerators are DIFFERENT

Denominators are SAME.

Fractions with same denominators are called LIKE FRACTIONS

Denominator	Fractions with same denominator / like fractions
7	$\frac{1}{7}, \frac{3}{7}, \frac{4}{7}$
74	$\frac{6}{74}, \frac{9}{74}, \frac{56}{74}$
12	—, —, —
17	—, —, —

Do you know?

Fractional representations of

- Days of a week: $\frac{1}{7}, \frac{2}{7}, \frac{3}{7}$
- Days of a month: $\frac{1}{31}, \frac{2}{31}, \frac{3}{31}$
- Months of a year are like fractions: $\frac{1}{12}, \frac{2}{12}, \frac{3}{12}$



Do this:

- 1) Circle the like fractions among the following

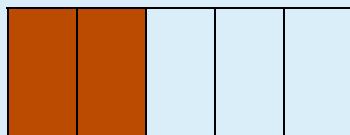
$$\frac{2}{6}, \frac{3}{8}, \frac{1}{5}, \frac{4}{6}, \frac{2}{7}, \frac{5}{6}, \frac{3}{6}$$

- 2) Circle the other than like fractions among the following

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

- 3) Write like fractions of the following figures

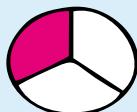
a)



Fraction of shaded part

Fraction of unshaded part

b)



Fraction of shaded part Fraction of unshaded part



9.7 Addition and Subtraction of Like Fractions

Let's eat the Birthday cake:

On Sreekari's birthday, she cut the cake into 10 pieces. She gave 2 pieces to Sreeja and 5 pieces to Sonali.



Sreeja's part or fraction :



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

Sonali's part or fraction :



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

Pieces taken by Sreeja and Sonali together :



$$= \frac{2}{10} + \frac{5}{10} = \frac{2+5}{10} = \frac{7}{10}$$

This is equal to seven tenths $\frac{7}{10}$

Now Srikari's part = three tenths $\frac{3}{10}$

Now, observe this:

Pieces of Sreeja +



Sonali



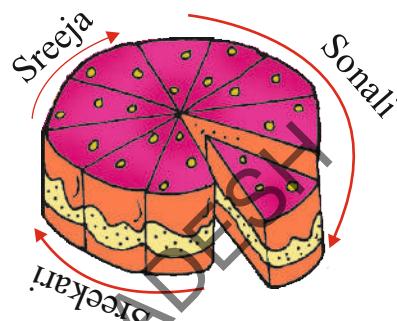
Sreekari



$$= 2 + 5 + 3 = 10 \text{ Pieces}$$

= 1 whole cake

$$= \frac{2}{10} + \frac{5}{10} + \frac{3}{10} = \frac{2+5+3}{10} = \frac{10}{10} = 1 \text{ whole}$$



Do this:

- | | | |
|--|--|--|
| a) $\frac{1}{7} + \frac{2}{7} = \underline{\quad}$ | b) $\frac{2}{5} + \frac{2}{5} = \underline{\quad}$ | c) $\frac{3}{4} + \frac{1}{4} = \underline{\quad}$ |
| d) $\frac{2}{6} + \frac{3}{6} = \underline{\quad}$ | e) $\frac{4}{8} + \frac{2}{8} = \underline{\quad}$ | f) $\frac{5}{9} + \frac{3}{9} = \underline{\quad}$ |

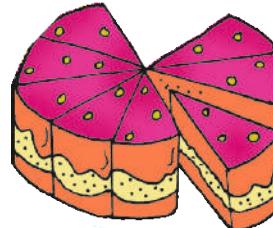
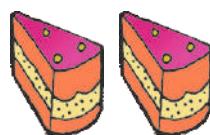
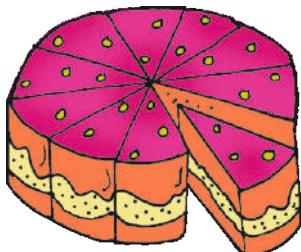
On Sreekari's Birthday, when Sreekari gave two pieces to Sreeja, number of pieces left with her is 8.

$$\frac{10}{10} - \frac{2}{10} = \frac{10 - 2}{10} = \frac{8}{10}$$

10 pieces

- 2 pieces

= 8 pieces



as a fractions we have

Do this:

a) $\frac{7}{12} - \frac{5}{12} =$ _____ b) $\frac{9}{10} - \frac{3}{10} =$ _____ c) $\frac{18}{20} - \frac{11}{20} =$ _____

Think and discuss :

a) $\frac{1}{2} + \frac{1}{2} =$ _____ b) $\frac{3}{4} + \frac{1}{4} =$ _____ c) $\frac{1}{2} - \frac{1}{2} =$ _____

● **Excercise - 9.1**

- 1) If in each of the following, all the addends are the same, complete the circles.

a) $(\frac{1}{2}) + (\frac{1}{2}) = 1$

b) $(\frac{1}{3}) + (\frac{1}{3}) + (\frac{1}{3}) = 1$

c) $(\bigcirc) + (\bigcirc) + (\bigcirc) + (\bigcirc) = 1$

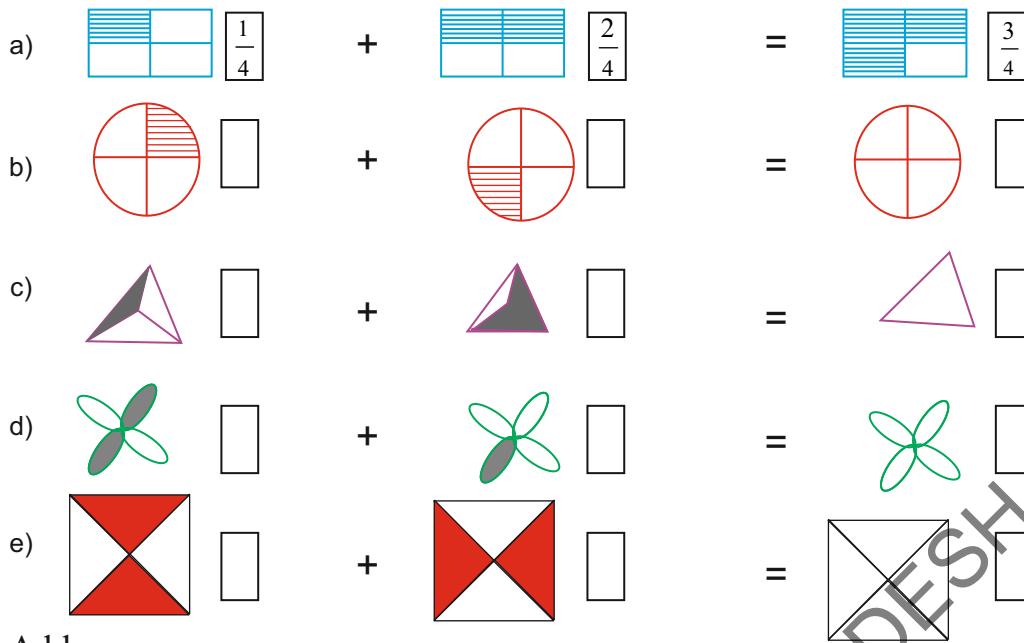
d) $(\bigcirc) + (\bigcirc) + (\bigcirc) + (\bigcirc) + (\bigcirc) = 1$

e) $(\bigcirc) + (\bigcirc) + (\bigcirc) + (\bigcirc) + (\bigcirc) + (\bigcirc) = 1$

f) $(\bigcirc) + (\bigcirc) + (\bigcirc) + (\bigcirc) + (\bigcirc) + (\bigcirc) + (\bigcirc) = 1$



2. Do the following additions. One is done for you.



3. Add

$$a) \frac{2}{7} + \frac{1}{7} \quad b) \frac{5}{11} + \frac{4}{11} \quad c) \frac{2}{13} + \frac{1}{13} + \frac{5}{13}$$

4. Find the value of $\frac{1}{3} + \frac{5}{3}$

5. Subtract the following

$$a) \frac{7}{12} - \frac{5}{12} \quad b) \frac{5}{9} - \frac{1}{9} \quad c) \frac{8}{19} - \frac{7}{19}$$

6. Find $\frac{4}{5} - \frac{1}{5}$



9.8 Comparison of Like fractions:

Take three strips of the same length. Divide each of them into 4 equal parts. Shade 1, 2 and 3 parts of them respectively. So, the shaded portions represent $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ respectively as shown below.



From the above figures, it's clear that

$$\frac{1}{4} < \frac{2}{4} < \frac{3}{4} \quad \text{and} \quad \frac{3}{4} > \frac{2}{4} > \frac{1}{4}$$

Now, take four strips of the same length. Divide each one of them into 5 equal parts.

Shade 1, 2, 3, and 4 parts, so that the shaded portions represent $\frac{1}{5}$, $\frac{2}{5}$, $\frac{3}{5}$ and $\frac{4}{5}$ respectively as shown below.



From the above figures, it is clear that :

$$\frac{1}{5} < \frac{2}{5} < \frac{3}{5} < \frac{4}{5} \quad \text{and} \quad \frac{4}{5} > \frac{3}{5} > \frac{2}{5} > \frac{1}{5}$$

Ascending order

Descending order

By observing the above fractions, we conclude that, “of the given two fractions with the same denominator, fraction with smaller numerator is smaller than the other”. So we arrange them in ascending or descending order, according to the ascending or descending order of their numerators.

Try this:

- ❖ Which is greater $\frac{3}{7}$ or $\frac{5}{7}$?
- ❖ Which is smaller $\frac{2}{6}$ or $\frac{4}{6}$?
- ❖ Arrange the following fractions in descending order $\frac{1}{9}$, $\frac{7}{9}$, $\frac{3}{9}$, $\frac{5}{9}$ and $\frac{2}{9}$
- ❖ Arrange the following fractions in ascending order $\frac{7}{12}$, $\frac{3}{12}$, $\frac{5}{12}$, $\frac{11}{12}$ and $\frac{9}{12}$

Exercise - 9.2

1. Write the correct symbol $>$ or $<$ in the given boxes

a) $\frac{2}{8}$ $\frac{4}{8}$

b) $\frac{3}{10}$ $\frac{8}{10}$

c) $\frac{5}{7}$ $\frac{6}{7}$

d) $\frac{23}{25}$ $\frac{21}{25}$

2. Circle the smallest fraction

a) $\frac{7}{8}$ $\frac{3}{8}$ $\frac{1}{8}$ $\frac{5}{8}$ $\frac{8}{8}$

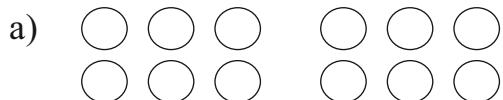
b) $\frac{7}{12}$ $\frac{3}{12}$ $\frac{5}{12}$ $\frac{11}{12}$ $\frac{9}{12}$

3. Circle the greatest fraction

a) $\frac{3}{5}$ $\frac{4}{5}$ $\frac{1}{5}$ $\frac{2}{5}$ $\frac{5}{5}$

b) $\frac{17}{21}$ $\frac{5}{21}$ $\frac{20}{21}$ $\frac{10}{21}$ $\frac{2}{21}$

4. Shade the following figures as per the given fractions and then compare



$\frac{2}{6}$ $\frac{5}{6}$

$\frac{4}{8}$ $\frac{6}{8}$

5. Arrange the following in ascending order

a) $\frac{4}{9}$ $\frac{2}{9}$ $\frac{5}{9}$ $\frac{1}{9}$ $\frac{7}{9}$

b) $\frac{4}{7}$ $\frac{2}{7}$ $\frac{3}{7}$ $\frac{5}{7}$ $\frac{1}{7}$

6. Arrange the following in descending order

a) $\frac{14}{27}$ $\frac{4}{27}$ $\frac{21}{27}$ $\frac{15}{27}$ $\frac{2}{27}$

b) $\frac{2}{7}$ $\frac{4}{7}$ $\frac{3}{7}$ $\frac{6}{7}$ $\frac{1}{7}$ $\frac{5}{7}$

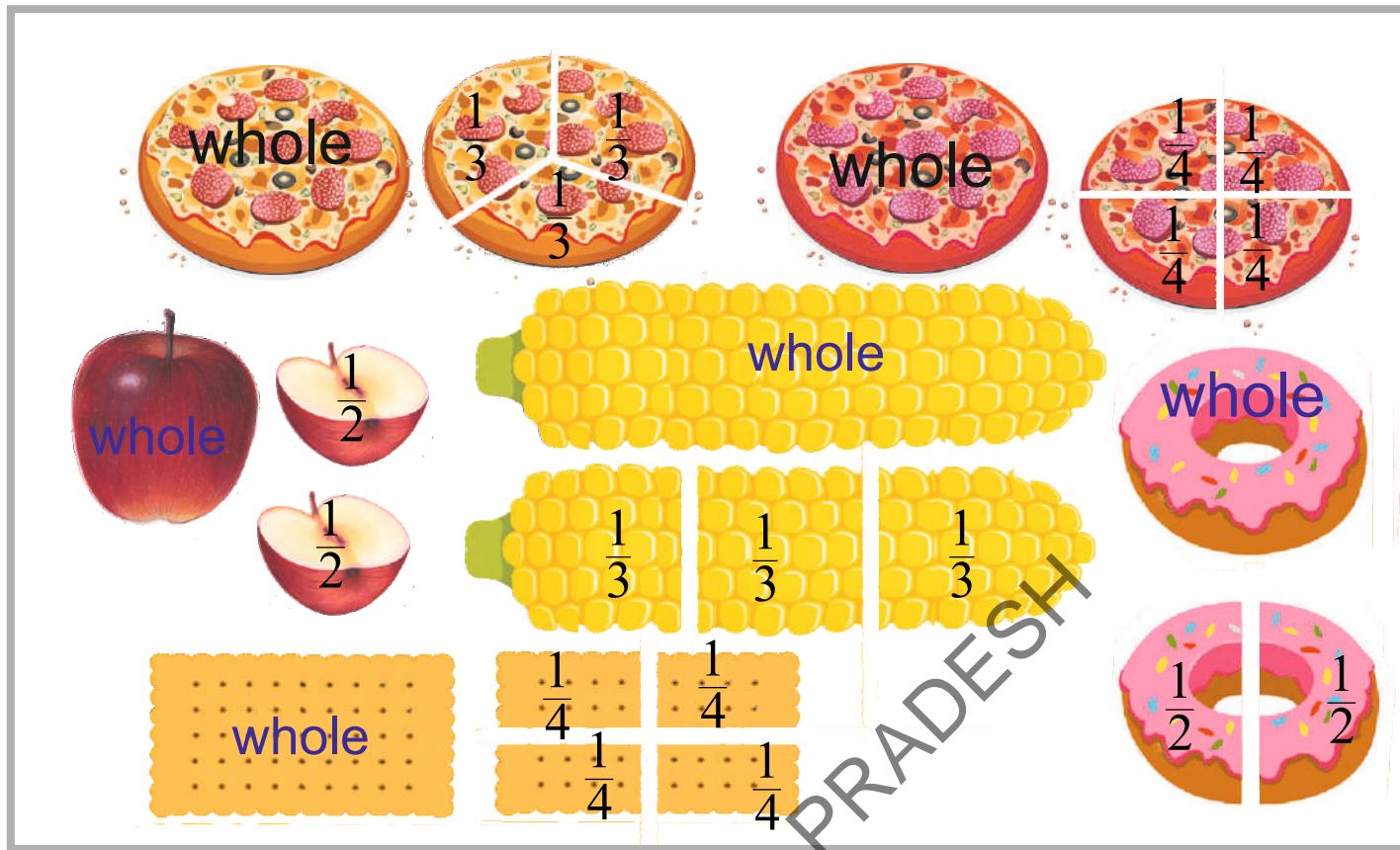


9.9 Applications of fractions in daily life :

In our daily life we come across many situations, where in we share whole object among two or three or many for instance.

- a) A pizza may be shared between three.
- b) Four fruits used for making juice for 5 people.
- c) Constructing a wall by more than 2 people etc....,

In all such cases we apply the concept of fractions in our daily life.

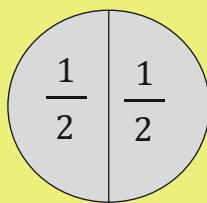


Exercise - 9.3

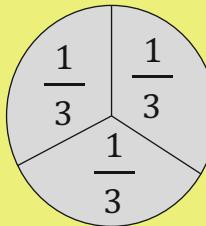
- 1) Arya adds $\frac{4}{7}$ litres of apple juice to $\frac{2}{7}$ litres of orange juice to make a fruit punch. How many litres of fruit punch does he have now?
- 2) A piece of ribbon (of length) $\frac{2}{9}$ was cut from a ribbon (of length) $\frac{5}{9}$ units. What is the length of the remaining ribbon?
- 3) If Kishore ate $\frac{9}{10}$ of a pizza and Adi ate $\frac{6}{10}$ of another pizza of same size, then how much more pizza did Kishore eat than Adi?
- 4) A scooter tank has $\frac{2}{3}$ litres of petrol. Prasad rides around for some time and sees that the petrol level has come down to $\frac{1}{3}$ litres. How much petrol does he use for riding around?
- 5) Krishna covered $\frac{1}{5}$ th of his journey to school and suddenly he realizes that he had forgotten to bring his maths book. So, he walked back and returned to school in time. What is the extra distance he walked than usual?

Lab Activity :

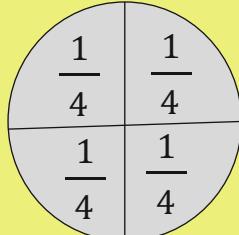
Take 3 circular card boards. Form the like fraction with different denominators show that all the addends are the same and the sum is equal to 1.



$$= 1$$



$$= 1$$

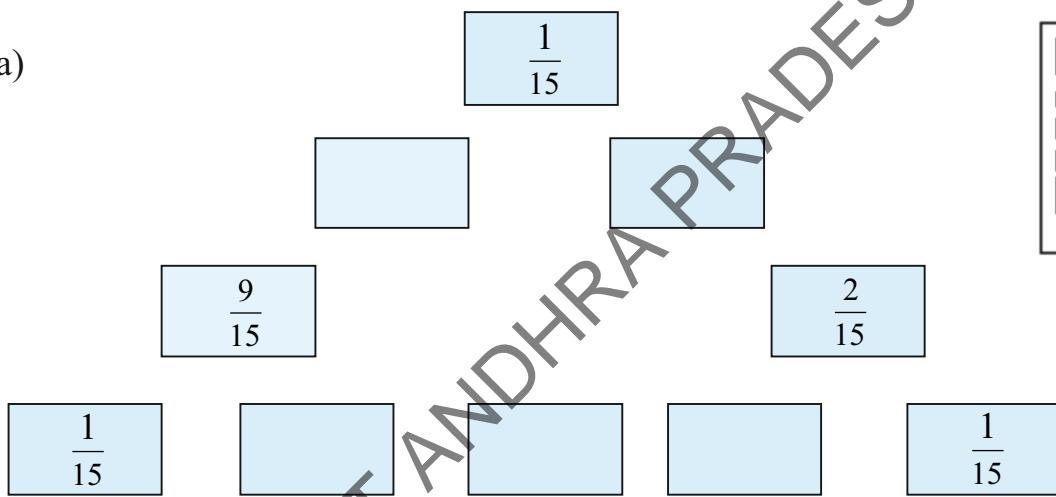


$$= 1$$

Fun Activity :

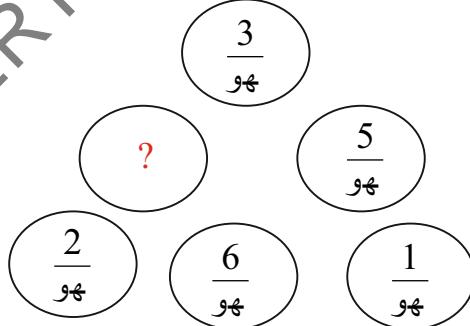
- What should be placed in the blank space so that the sum of the fractions along each side of the triangle is same?

a)



R8T4H1

a)



PROJECT WORK

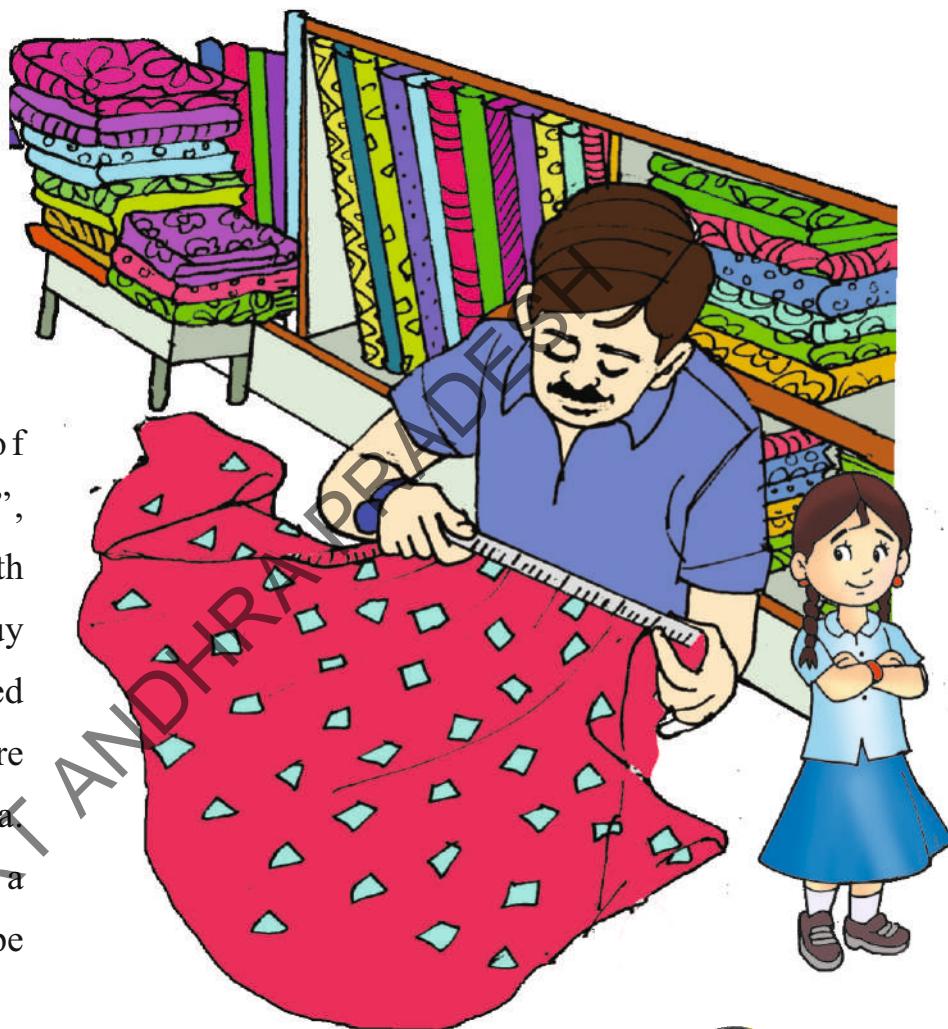
Half a cake is as tasty as a full cake, but half a 10 rupees note is of no use. Find three things that can be used if you put them in to halves and three things that cannot be used if put into halves.



10 A) Length



On the occasion of “Ganganamma jathara”, Meera went to cloth shop with her mother Kamala to buy new clothes. Kamala asked the shopkeeper to give 1metre length of cloth for Meera. Shopkeeper measured with a 50 cm measuring scale or tape for two times.



- ❖ What do you observe in the above picture?
- ❖ How much length of the cloth did Kamala ask ?
- ❖ What is the measuring scale used by the shopkeeper?
- ❖ How many times did he measure 1 metre of cloth?
- ❖ He measured for two times, is it equal to one metre?



The relationship between Metres and Centimetres :

Observe the above measuring tape and count the number of divisions /graduations on it.

We observe that :



One metre is divided into 100 equal parts. Each part is called centimetres.

So, 1 metre = 100 centimetres, and vice –versa. so, 100 cm = 1m

While converting metres into cm we have to multiply with 100.

Example - 1

$$9 \text{ m} = 9 \times 100 \text{ cm} = 900 \text{ cm}$$

$$50 \text{ m} = 50 \times 100 \text{ cm} = 5000 \text{ cm}$$



To convert centimetres into metres we divide the given centimetres by 100.

Example - 2

$$\begin{aligned} 754 \text{ cm} &= 700 \text{ cm} + 54 \text{ cm} \\ &= 7 \times 100 \text{ cm} + 54 \text{ cm} \\ &= 7 \times 1 \text{ m} + 54 \text{ cm} \\ &= 7 \text{ m} + 54 \text{ cm} \\ &= 7 \text{ m } 54 \text{ cm} \end{aligned}$$

$$754 \div 100 = 7 \text{ Q} + 54 \text{ R}$$

When a number is divided by 100 the number formed by the digits in tens and ones place taken in the same order is the remainder and the residual number is the quotient.

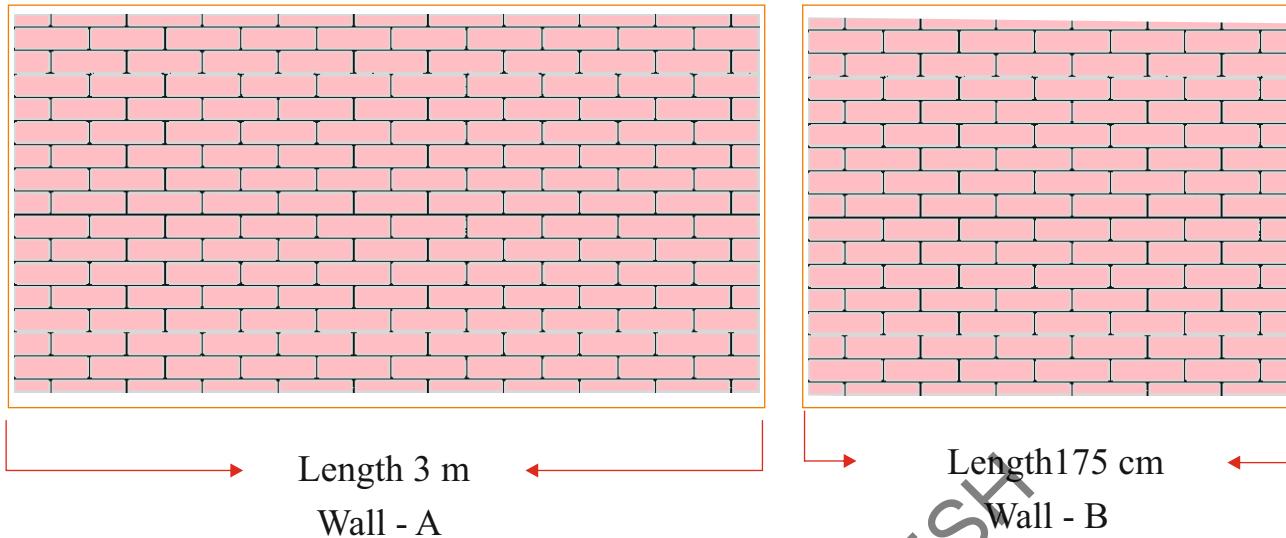
$$\text{So, } 754 \text{ cm} = 7 \text{ m } 54 \text{ cm} = 7 \text{ m } 54 \text{ cm}$$

Activity:

Make the students into 4 groups. Provide 1m thread to each group. Ask each group to cut the given thread into possible equal parts as given in the table and complete the table.

Length of the thread	Length of each pieces	Number of each piece	Length of each piece x Number of pieces made
1m	10cm		10cm x <u>10</u> = <u>100</u> cm
1m	20cm		<u> </u> cm x <u> </u> = <u> </u> cm
1m	25cm		<u> </u> cm x <u> </u> = <u> </u> cm
1m	50cm		<u> </u> cm x <u> </u> = <u> </u> cm

Which is lengthy?



Which wall is more in length? A or B?

To compare the values of lengths we have to convert them into same units.

$$3 \text{ m} = 3 \times 100 = 300 \text{ cm}$$

$$\text{as } 300 \text{ cm} > 175 \text{ cm}$$

$$\text{therefore } 3 \text{ m} > 175 \text{ cm}$$

Though $3 < 175$.
We can't say
wall - A < wall - B.
As, they are
expressed in
different units.

Which length
is more?
3m? or 175cm?



Example - 3

Fill in the blanks with the suitable symbols $<$, $>$ or $=$

(After converting them into the same units)

a) $5 \text{ m} < \underline{610 \text{ cm}}$

b) $8 \text{ m } \underline{41 \text{ cm}} = 841 \text{ cm}$

c) $15 \text{ m } 50 \text{ cm} < \underline{1250 \text{ cm}}$

Exercise - 1

1. Convert the following into centimetres:

a) $18 \text{ m} = 18 \times \underline{\quad} = \underline{\quad} \text{ cm}$

b) $100 \text{ m} = 100 \times \underline{\quad} = \underline{\quad}$

- c) $17 \text{ m } 25 \text{ cm} = 17 \times \underline{\quad} \text{ cm} + \underline{\quad} \text{ cm} = \underline{\quad} \text{ cm} + \underline{\quad} \text{ cm} = \underline{\quad} \text{ cm}$
d) $45 \text{ m } 75 \text{ cm} = 45 \times \underline{\quad} \text{ cm} + \underline{\quad} \text{ cm} = \underline{\quad} \text{ cm} + \underline{\quad} \text{ cm} = \underline{\quad} \text{ cm}$
2. Convert centimetres into metres and centimetres.
- a) $269 \text{ cm} = \underline{\quad}$ b) $693 \text{ cm} = \underline{\quad}$ c) $703 \text{ cm} = \underline{\quad}$ d) $400 \text{ cm} = \underline{\quad}$
3. Match the following :

2 m	5000 cm
2 m 5 cm	200 cm
8 m 90 cm	2500 cm
25 m	205 cm
50 m	890 cm



4. Fill in the blanks with suitable symbol $<$, $>$ or $=$
- a) $4 \text{ m } 90 \text{ cm } \underline{\quad} 480 \text{ cm}$ b) $67 \text{ m } \underline{\quad} 6800 \text{ m}$
c) $75 \text{ m } \underline{\quad} 7500 \text{ cm}$ d) $80 \text{ m } \underline{\quad} 9000 \text{ cm}$

Think and discuss

Can you cut a rope of length 1 m into 4 equal pieces without measuring it. How?

Word problems on Addition & Subtraction:

Example- 4

Mastan built a 2m 20cm length of wall in the morning and 1m 90cm in the afternoon. What is the total length of the wall built by Mastan?

Solution:

Step - 1



	m	cm	
Length of the wall built in the morning	= 2	20	
Length of the wall built in the after noon	= 1	90	
			= 110 (110 cm = 100 cm + 10 cm)
			= 1 m + 10 cm)

Step - 2

$$\begin{array}{r} \text{m} \quad \text{cm} \\ = 2 \quad 20 \\ = 1 \quad 90 \quad (3 \text{ m} + 1 \text{ m} + 10 \text{ cm} = 4 \text{ m } 10 \text{ cm}) \\ = \underline{4 \quad 10} = 4 \text{ m } 10 \text{ cm} \end{array}$$



Steps to follow:

1. Add cm and convert them into metres. ($20 \text{ cm} + 90 \text{ cm} = 110 \text{ cm} = 1\text{m } 10\text{cm}$)
2. Carry forward 1m to metres place. Add metres ($2\text{m} + 1\text{m} + 1\text{m} = 4\text{m}$)
3. Write the final answer. ($3\text{m} + 1\text{m} + 10\text{cm} = 4\text{m } 10\text{cm}$)

Example - 5

If Masthan wants to build a 10m length of wall and he has completed 4m10cm of wall, how much more has he got to build?

The length of wall to be built by Mastan =

Total length of wall built

Balance length of wall to be built

$$\begin{array}{r} \text{m} \quad \text{cm} \\ 9 \quad 100 \\ + \quad 00 \\ \hline 10 \quad 00 \\ = (-) 4 \quad 10 \\ \hline 5 \quad 90 \\ = \quad 5\text{m } 90\text{cm} \end{array}$$

Steps to follow:

1. To subtract 10 cm from 0 cm, we exchange 1m for 100 cm. Then there exists 9 in metres place.
2. Now subtract 10 cm from 1 metre that is 100 cm.
3. Subtract 4 m from 9 m.

Exercise - 10.1

1. Do the following.

a) m cm
 25 15
+ 13 20
—————

b) m cm
 25 90
+ 85 14
—————

c) m cm
 39 00
+ 46 75
—————

d) m cm
 85 75
+ 14 36
—————

2. Do the following.

a) $10 \text{ m } 55 \text{ cm} + 65 \text{ m } 65 \text{ cm}$

b) $98 \text{ m } 50 \text{ cm} + 115 \text{ m } 45 \text{ cm}$

c) $684 \text{ m} + 225 \text{ m } 80 \text{ cm}$

d) $60 \text{ m } 45 \text{ cm} + 85 \text{ m } 28 \text{ cm}$

3. Do the following.

a) m cm

96 25

- 25 75

b) m cm

84 18

- 36 50

c) m cm

85 00

- 74 80

d) m cm

35 14

- 34 29

4. Do the following.

a) $75 \text{ m } 85 \text{ cm} - 10 \text{ m } 30 \text{ cm}$

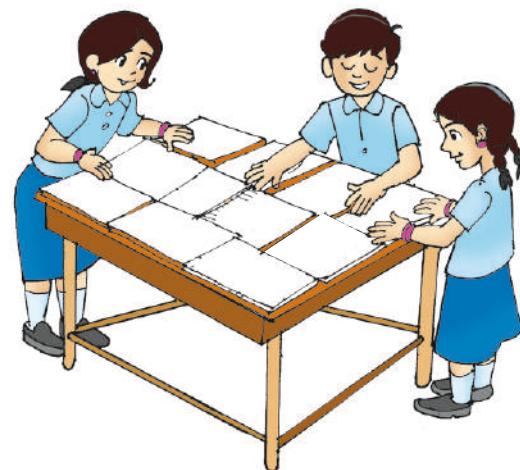
b) $69 \text{ m } 50 \text{ cm} - 25 \text{ m } 60 \text{ cm}$

c) $95 \text{ m} - 88 \text{ m } 40 \text{ cm}$

5. Radha's elder son needs 1m 80 cm of cloth whereas younger son needs 1 m 60 cm of cloth for their shirts. How much length of cloth is needed for them?
6. The length of a flower bed is 20 m 50 cm. Radha dug a length of 8 m 50 cm. Then still how much length of the flower bed is to be dug?
- 7) Balamma is working in a handloom industry. She spins yarn of length 720 m 50 cm and 850 m 30 cm on successive days, then how much yarn has she spun in both the days?
- 8) If two ropes of length 10m 50 cm and 9 m 60 cm are tied together. Then the length of the rope so formed is? (approximately)
- 9) Narayana can make 60 m thread in one day. If he completes 36 m 50 cm by the afternoon, how much length of thread is to be made by him?

Project work :

Make an improvised metre scale using a card board, measuring tape, white paper, fevicol and exhibit it in your class.



10.2 Weight

Rani went to Anjaiah's grocery shop to buy 1kg of jaggery. Anjaiah measured the jaggery using a weighing pan. He used two 500 g measuring units as there is no 1kg measuring unit.

- * What do you observe in the picture?
- * What does Rani want to buy? How much did she want to buy?
- * How many weighing stones did Anjaiah use to weigh the jaggery?
- * What is labelled on the weights? How much does each weigh?
- * Read the weight in the left pan.
- * What weights did Anjaiah use to measure 1kg?
- * Are those weights equal to 1kg?



Relation between kilogram and gram:

Ask the students to observe the following. Put 1kg weight on the left pan of weighing machine. Put different weights on the right pan to make both pans equal. Observe them to identify the total weight as 1000 grams.



Therefore $1\text{kg} = 1000\text{ g}$ and vice - versa $1000\text{ g} = 1\text{ kg}$

To convert kilograms into grams we have to multiply with 1000

Example - 1

Convert 8 kilograms into grams

$$8\text{ kg} = 8 \times 1000\text{g} = 8000\text{g}$$

Example - 2

Convert 2864 grams into kilograms and grams

$$\begin{aligned}2864\text{ grams} \\&= 2000\text{ g} + 864\text{ g} \\&= 2 \times 1000\text{ g} + 864\text{ g} \\&= 2 \times 1\text{ kg} + 864\text{ g} \\&= 2\text{kg} + 864\text{ g} = 2\text{ kg } 864\text{ g}\end{aligned}$$



Which weighs more?

Which weighs more? Is 5kg? or 500 grams? When we compare two weights, we have to convert them into same units.

$$5 \text{ kg} = 5 \times 1000 \text{ g} = 5000 \text{ g}$$

as $5000 \text{ g} > 500 \text{ g}$

so $5 \text{ kg} > 500 \text{ g}$



5 kg



500 g

Do this:

1. Convert the following into grams.

a) $5 \text{ kg} = 5 \times 1000 \text{ grams} = \underline{\hspace{2cm}}$ grams

b) $15 \text{ kg} = 15 \times \underline{\hspace{2cm}} \text{ grams} = \underline{\hspace{2cm}} \text{ grams}$

c) $7 \text{ kg } 250 \text{ g} = \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} \text{ g} + \underline{\hspace{2cm}} \text{ g} = \underline{\hspace{2cm}} \text{ g} + \underline{\hspace{2cm}} \text{ g} = \underline{\hspace{2cm}} \text{ g}$

d) $55 \text{ kg } 500 \text{ g} = \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} \text{ g} + \underline{\hspace{2cm}} \text{ g} = \underline{\hspace{2cm}} \text{ g} + \underline{\hspace{2cm}} \text{ g} = \underline{\hspace{2cm}} \text{ g}$

2. Convert grams into kilograms

a) 2680 grams b) 7455 grams c) 4000 grams d) 8050 grams

3. Suggest the suitable symbol in the provided space. ($<$, $>$ or $=$)

a) $4 \text{ kg } 900 \text{ g } \underline{\hspace{2cm}} 4800 \text{ g}$

b) $67 \text{ kg } \underline{\hspace{2cm}} 68000 \text{ g}$

c) $75 \text{ kg } \underline{\hspace{2cm}} 75000 \text{ g}$

d) $80 \text{ kg } \underline{\hspace{2cm}} 9000 \text{ g}$

Addition:

Example -1

1) Rangaiah bought 13 kg 500 g of laddu and 10 kg 750 kg mysorepak for his family function. Find the total weight of the sweets he bought.

Solution:

kg	g
Weight of laddus	= 13 500
Weight of mysorepak	$\frac{= (+) 10 \quad 750}{\textcircled{1} \quad 250}$
(1250g = 1000g + 250g)	= 1 kg + 250 g $\textcircled{1}$

13	500
(+)	10 750
$\frac{=}{}$	24 250

Total weight = 24 kg 250 g

Steps to follow:

1. Add grams. ($500 \text{ g} + 750 \text{ g} = 1250 \text{ g}$)
2. Convert 1250 g into kilograms. ($1250 \text{ g} = 1000 \text{ g} + 250 \text{ g} = 1\text{kg} + 250 \text{ g}$)
3. Add kilograms ($1\text{kg} + 10 \text{ kg} = 23 \text{ kg}$)

Write the answer in kg - g ($23 \text{ kg} + 1 \text{ kg} + 250 \text{ g} = 24 \text{ kg } 250 \text{ g}$)

Example - 2

Rangamma purchased 30 kgs of rice. Out of that she utilised 18 kg 500 g. What is the balance of rice with her?

	kg	g	
Rice purchased by Rangamma	29	1000	SCHOOL OF ANDHRA PRADESH
Utilised rice	30	000	
Balance of rice	(-) 18	500	
	<hr/>	<hr/>	
	= 11	500	= 11kg 500g

Steps to follow:

1. To subtract 500 g from 0 g, we have to convert 1 kg into grams from kilograms place. Then there exists 29 in kilogram place.
2. Now subtract 500 g from 1000 g and write in the grams place.
3. Subtract 18 kg from 29 kgs and write in the kgs place.

Exercise - 10.3

1. Add

a) kg g

50 600	85 500	96 750	40 300
+ 32 750	+ 38 600	+ 84 800	+ 50 200
—————	—————	—————	—————
—————	—————	—————	—————

b) kg g

50 600	85 500	96 750	40 300
+ 32 750	+ 38 600	+ 84 800	+ 50 200
—————	—————	—————	—————
—————	—————	—————	—————

c) kg g

50 600	85 500	96 750	40 300
+ 32 750	+ 38 600	+ 84 800	+ 50 200
—————	—————	—————	—————
—————	—————	—————	—————

d) kg g

50 600	85 500	96 750	40 300
+ 32 750	+ 38 600	+ 84 800	+ 50 200
—————	—————	—————	—————
—————	—————	—————	—————

2. Do the following.

a) $2 \text{ kg } 250 \text{ g} + 12 \text{ kg } 580 \text{ g}$

b) $500 \text{ kg } 750 \text{ g} + 250 \text{ kg } 800 \text{ g}$

c) $450 \text{ kg } 350 \text{ g} + 300 \text{ kg } 350 \text{ g}$

d) $580 \text{ kg } 500 \text{ g} + 400 \text{ kg } 680 \text{ g}$

3. Subtract

a) kg g
26 750
- 14 800

b) kg g
42 300
- 39 750

c) kg g
83 500
- 62 850

d) kg g
96 600
- 36 850

4. Do the following.

a) $5 \text{ kg } 450 \text{ g} - 3 \text{ kg } 500 \text{ g}$

b) $50 \text{ kg } 280 \text{ g} - 12 \text{ kg } 450 \text{ g}$

c) $100 \text{ kg } 150 \text{ g} - 85 \text{ kg } 280 \text{ g}$

d) $85 \text{ kg } 250 \text{ g} - 40 \text{ kg } 500 \text{ g}$

5. A school has a stock of 25kg 600g rice. 198 kg 300 g of rice was supplied for the midday meal scheme. Now how many kilograms of rice is available in the school?

6. To make a sweet the maker added 10 kg 600 g of jaggery, 20 kg 350 g of atta and 500 g of ghee. What is the total weight of these three?

7. Rangayya bought 1kg 500 g of potatoes, 750 g of carrot, 500 g of tomatoes and 2 kg of onions. What is the total weight of vegetables he bought?

8. There is 100 kg of sugar in a shop. If the shop keeper sells out 78 kg, find the sugar left in the shop.

9. Chinnayya collected 108 kg 800 g of tamarind from one tree and 120kg tamarind from another tree. If he sells 150 kg from that, how many kilos of tamarind did he have now?

10. Rajani melted 25 g and 28 g weights of gold ear rings. She got 49g of gold. How much weight of gold is lost in melting?

11. The vendor collected 76 kg butter and mixed it with 12 kg 500 g of butter that is already in his shop. If he sells 82 kg of butter how much will be left with him?

12. The weight of a new born baby was 2 kg 800 g. After 2 years her weight is 8 kg 300 g. Calculate the weight gained.

13. 40 kg 500 g of putharekulu were prepared in a sweet shop on first day and 45 kg 800 g of putharekulu on the second day. If he sells 65 kg putharekulu then how much will be left with him?

10.3 Capacity

Ramya went to Papaiah's milk selling center to buy 1 litre of milk. Papaiah measured with two 500ml measuring jars as there is no 1 litre measuring jar. Then Ramya thought whether the total capacity of two 500ml measuring jars equal to 1l?

- * What do you observe in the picture ?
- * How many litres of milk did Ramya ask for?
- * Which measuring unit does Papaiah has? Is there any other measuring jar to measure 1L?
- * Which measuring unit did Papaiah use to measure one litre of milk?
- * How many times he has to use that jar to measure one litre?
- * Can you measure one litre of milk with any other units?



Relation between litres and millilitres:

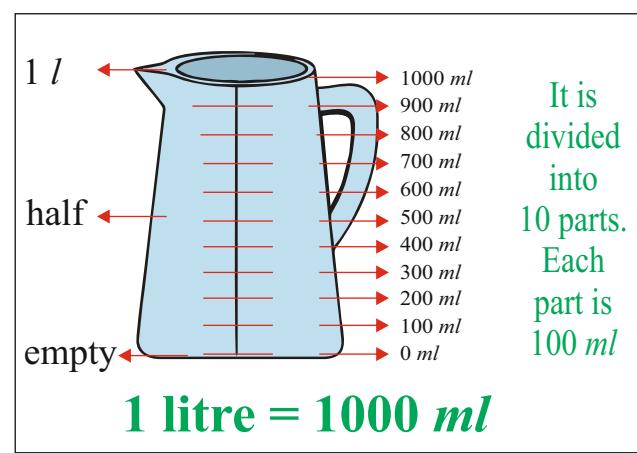
Take 1liter and 100 millilitre measuring jars. Fill the 100 millilitre measuring jar with water and empty the contents into the 1litre jar. How many of these 100ml jars are needed to completely fill 1litre jar? You will see that ten 100 ml jars of water is required to completely fill the 1litre jar. Alternately we can empty 1l water into ten 100 ml jars.

This shows

$$1\text{liter} = 10 \times 100 \text{ millilitres} = 1000 \text{ millilitres}$$

$$\text{and } 1000 \text{ millilitres} = 1\text{litre}$$

To convert litres into millilitres we have to multiply the litres with 1000.



Complete the following table to make one litre.

Water to be filled	Capacity of the jar	Number of times the jar used to fill	Capacity of the jar \times number times jar used = total capacity
1 litre	200 ml		
1 litre	250 ml		
1 litre	500 ml		

Example - 1

Convert 12 litres into millilitres

$$12 \text{ litres} = 12 \times 1000 \text{ ml} = 12000 \text{ ml}$$

Example - 2

$$\begin{aligned} 15 l 500 \text{ ml} &= 15 \times 1000 \text{ ml} + 500 \text{ ml} \\ &= 15000 \text{ ml} + 500 \text{ ml} \\ &= 15500 \text{ ml} \end{aligned}$$

Example - 3

Convert 6850 ml into litres and millilitres

$$\begin{aligned} 6850 \text{ millilitres} &= 6000 \text{ ml} + 850 \text{ ml} \\ &= 6 \times 1000 \text{ ml} + 850 \text{ ml} \\ &= 6 \times 1 \text{ litre} + 850 \text{ ml} \\ &= 6 \text{ litres} + 850 \text{ ml} \\ &= 6 \text{ litres } 850 \text{ ml} \end{aligned}$$

Which can hold more water?

- * Which of these has more capacity?
- * Which is more ? 5 litres or 500 ml.
- * When we compare the values of capacity, then we have to convert them into same units. That is into smaller unit.

$$5 \text{ liters} = 5 \times 1000 \text{ ml} = 5000 \text{ ml}$$

$$\text{As } 5000 \text{ ml} > 500 \text{ ml}$$

$$\text{So } 5 \text{ l} > 500 \text{ ml}$$



Do this:

1) Convert litres into millilitres

a) 5 litres = $5 \times 1000 \text{ ml}$ = _____ ml

b) 18 litres = $18 \times \underline{\quad} \text{ ml}$ = _____ ml

c) 37 litres = $\underline{\quad} \times \underline{\quad} \text{ ml}$ = _____ ml

d) 86 litres = $\underline{\quad} \times \underline{\quad} \text{ ml}$ = _____ ml

e) 100 litres = $\underline{\quad} \times \underline{\quad} \text{ ml}$ = _____ ml

2) Convert millilitres into litres and millilitres

a) 8250 ml b) 7000 ml c) 5500 ml d) 4850 ml e) 10550 ml

3) Place the correct symbol in the space provided ($>$, $<$ or $=$)

a) $6 \ell \underline{\quad} 5500 \text{ ml}$ b) $8 \ell \underline{\quad} 8000 \text{ ml}$

c) $5 \ell \underline{\quad} 6000 \text{ ml}$ d) $3 \ell \underline{\quad} 3500 \text{ ml}$ e) $9 \ell \underline{\quad} 980 \text{ ml}$



Additions

Example - 4

At a petrol bunk, a motorcyclist filled the petrol tank of his motorcycle with $2\ell 500 \text{ ml}$ of petrol on the first day and $3\ell 750 \text{ ml}$ on the second day. Find the total amount of petrol bought.

Total capacity of petrol filled in two days = Capacity of petrol filled on first day

+ capacity of petrol filled on second day

$$= 2 \ell 500 \text{ ml} + 3 \ell 750 \text{ ml}$$

$$= 2 \ell + 500 \text{ ml} + 3 \ell + 750 \text{ ml}$$

$$= 2 \ell + 3 \ell + 500 \text{ ml} + 750 \text{ ml}$$

$$= 5 \ell + 1250 \text{ ml}$$

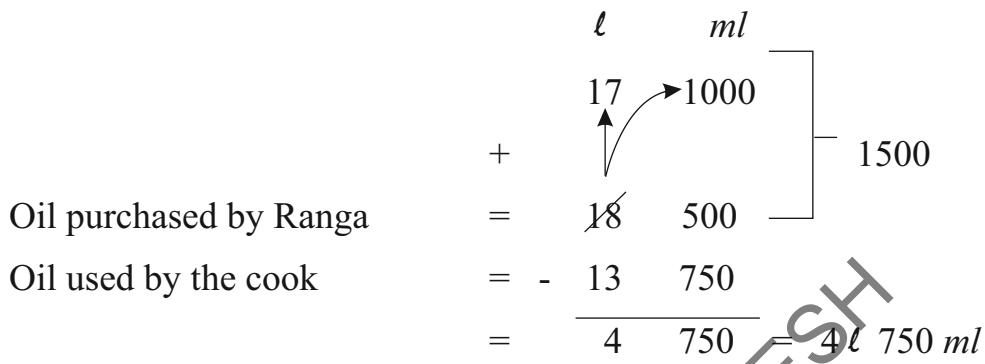
$$= 5 \ell + 1 \ell + 250 \text{ ml}$$

$$= 6 \ell 250 \text{ ml}$$



Subtractions Example - 5

Ranga purchased $18\ell 500\text{ ml}$ ground nut oil to make food items on his daughter's birthday celebrations .The cook used $13\ell 750\text{ ml}$ oil, find the capacity of the left over oil.



Steps :

- Comparatively 750 ml is more than 500 ml . So take 1 litre from litres place and convert it into ml (as 1000 ml). Then it will become 1500 ml . So we can subtract 750 ml from it .
- By subtracting 750 ml from 1500 ml we will get 750 ml .
- We took 1ℓ from 18 litres. So it becomes 17ℓ . By subtracting 13ℓ , we will get 4ℓ .

Exercise - 10.4

- Do the following additions.

$$\begin{array}{r}
 a) \quad l \quad ml \\
 5 \quad 750 \\
 + 7 \quad \underline{650} \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 b) \quad l \quad ml \\
 8 \quad 980 \\
 + 6 \quad \underline{250} \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 c) \quad l \quad ml \\
 30 \quad 400 \\
 + 7 \quad \underline{650} \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 d) \quad l \quad ml \\
 15 \quad 350 \\
 + 7 \quad \underline{650} \\
 \hline
 \end{array}$$

$$e) \quad 18\ell 450\text{ ml} + 28\ell 890\text{ ml} \qquad f) \quad 50\ell 850\text{ ml} + 70\ell 450\text{ ml} \qquad g) \quad 89\ell 950\text{ ml} + 45\ell 650\text{ ml}$$

- Do the following subtractions.

$$\begin{array}{r}
 a) \quad l \quad ml \\
 25 \quad 380 \\
 - 16 \quad \underline{540} \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 b) \quad l \quad ml \\
 50 \quad 500 \\
 - 35 \quad \underline{750} \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 c) \quad l \quad ml \\
 85 \quad 250 \\
 - 78 \quad \underline{500} \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 d) \quad l \quad ml \\
 98 \quad 650 \\
 - 50 \quad \underline{750} \\
 \hline
 \end{array}$$

- e) $15 \ell 350 \text{ ml} - 10 \ell 800 \text{ ml}$ f) $70 \ell 850 \text{ ml} - 25 \ell 900 \text{ ml}$
 g) $99 \ell 350 \text{ ml} - 16 \ell 600 \text{ ml}$ h) $25 \ell - 18 \ell 250 \text{ ml}$
- 3) A buffalo gives $3 \ell 250 \text{ ml}$ milk in the morning and $2 \ell 750 \text{ ml}$ in the evening. Find the total milk given by it in one day.
- 4) Rajesh purchased $1 \ell 500 \text{ ml}$ and 2ℓ cool drink bottles. What is the total capacity of cool drink he purchased?
- 5) A liquid blue bottle contains 250 ml . Rajani used 100 ml in it. Find the liquid left in the bottle.
- 6) Sreenu used some kerosene from 200ℓ drum. If there is still $18 \ell 750 \text{ ml}$ of the kerosene in the drum, how much kerosene was used by him?

10.4 Time

Skipping competition:



Vani



Geeta



Reeta



Vasantha

The following table shows number of skips / jumps made by the students. Observe the table and answer the questions given below.

S. No.	Name of the player	Number of skips / jumps	Time taken for skipping
1.	Vani	50	1 minute
2.	Geeta	50	2 minutes
3.	Reeta	50	3 minutes
4.	Vasantha	50	Less than 1 minute

- How much time did Vani take for 50 skips?
- How much time did Geetha take for 50 skips?
- Who took more time for 50 skips? By how much?
- Who took least time for 50 skips? By how much?

Introduction of Second's hand of a clock:

Activity: Colour the adjacent figure as per the suggestions given below.

- * Fill the hours hand with black colour.
- * Fill the minutes hand with green colour.
- * Fill the longest hand red colour.



Do you know!

The longest hand indicates
SECONDS

If second's hand moves from number 12 to next small division, then the time covered is 1 second. If seconds hand moves from 12 to 2nd small division, then the time covered is 2 seconds

Like that seconds hand moves to 3rd division time is 3 seconds

4th division

time is 4 seconds

5th division

time is 5 seconds



If the seconds hand is at the number 1 then it represents $1 \times 5 = 5$ seconds.

If the seconds hand is at the number 2 then it represents $2 \times 5 = 10$ seconds.

If the seconds hand is at the number 3 then it represents $3 \times 5 = 15$ seconds.

If the seconds hand is at the number 12 after completing one full rotation then the time is $12 \times 5 = 60$ seconds.

Thus, the seconds hand moves over 60 divisions, the minutes hand moves 1 division.

That is 60 seconds = 1 minute.

Therefore **1 minute = 60 seconds**

If minutes hand crosses one division, the seconds hand crosses 60 such divisions.



Example - 1

How many divisions did seconds hand crossed?

Solution:

Seconds hand at 2

Then $2 \times 5 = 10$ divisions crossed

= 10 seconds

Time : 3 hours 5 minutes 10 seconds.

(3.5.10)



Let us read the clock and note the time in the given boxes.

(2×5)

(3×5)

Time: hours

5

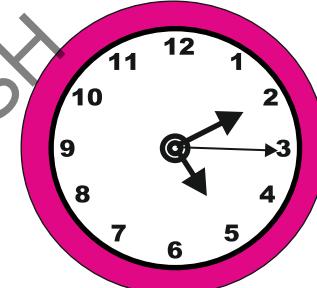
minutes

10

seconds

15

(5.10.15)



Example - 2

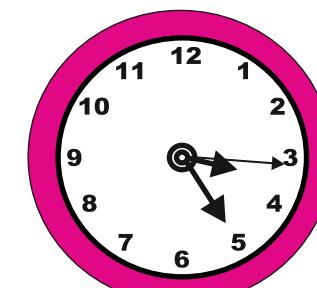
- Observe the clock and fill the boxes according to the given time and also draw hour, minutes and seconds hand corresponding to the time.

Time: hours

minutes

seconds

(3.25.15)



Example - 3

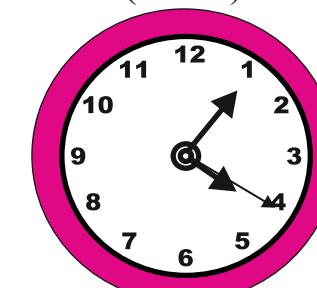
- Observe the clock and fill the boxes according to the given time and also draw hour, minutes and seconds hand corresponding to the time

Time: hours

minutes

seconds

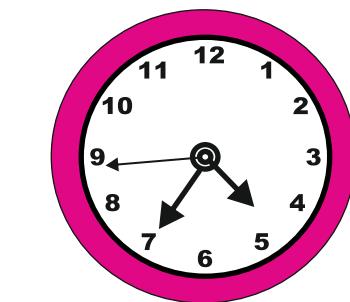
(4.5.20)



When seconds hand lies in between two numbers then we note the time as given below.

Example - 4

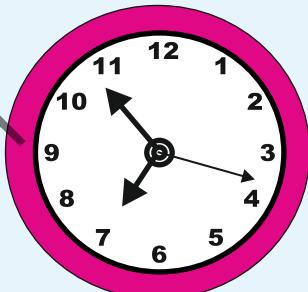
$$\text{Time: hours } 4 \quad \text{minutes } 35 \quad \text{seconds } 44$$



Do this:

Observe second's hand in between the two numbers
then we note the time as given below.

$$\text{Time: hours } \square \quad \text{minutes } \square \quad \text{seconds } \square$$



To convert the minutes into seconds,
we multiply the minutes by 60.

How many seconds make 5 minutes?

We know 1 minute = 60 seconds

Then 5 minutes = 5×60 seconds = 300 seconds

$$1 \text{ hour} = 60 \text{ minutes}$$
$$1 \text{ minute} = 60 \text{ seconds}$$

Do this:

Convert the minutes into seconds. One is done for you.

$$8 \text{ minutes} = 8 \times 60 = 480 \text{ seconds}$$
$$10 \text{ minutes} = \square \times \square = \square \text{ seconds}$$
$$15 \text{ minutes} = \square \times \square = \square \text{ seconds}$$



Do you know!

To convert hours into
seconds, we multiply
number of hours with 3600

$$\text{So, } 1 \text{ hour} = 60 \text{ minutes}$$
$$60 \text{ minutes} = 3600 \text{ seconds}$$
$$1 \text{ hour} = 3600 \text{ seconds}$$



Do this:

Hours	seconds	
2 hours	<input type="text" value="2"/> x <input type="text" value="3600"/>	<input type="text" value="7200"/> seconds
3 hours	<input type="text"/> x <input type="text"/>	<input type="text"/> seconds
4 hours	<input type="text"/> x <input type="text"/>	<input type="text"/> seconds

Example - 5

Convert into seconds; 1 hour 12 minutes 10 seconds

$$\begin{aligned}1 \text{ Hour} &= 1 \times 60 = 60 \text{ minutes} \\&= 60 \times 60 \text{ seconds} \\&= 3600 \text{ seconds}\end{aligned}$$

$$\begin{aligned}12 \text{ minutes} &= 12 \times 60 \\&= 720 \text{ seconds}\end{aligned}$$

$$10 \text{ seconds} = 10 \text{ seconds}$$

$$\text{Now } 1 \text{ hour } 12 \text{ minutes } 10 \text{ seconds} = 3600 + 720 + 10 = \underline{4330} \text{ seconds.}$$

Example - 6

Ramayya worked for 3 hours 45 minutes at the field in the morning and 3 hours 55 minutes in the evening. What is the total time he worked in the field?

$$\begin{array}{lcl}\text{Ramayya's working time in the morning} & = & 3 \text{ hours } 45 \text{ minutes} \\ \text{Ramayya's working time in the evening} & = & 3 \text{ hours } 55 \text{ minutes} \\ \text{Total time he worked} & & = ?\end{array}$$

Step 1:

$$\begin{array}{r} h \quad m \\ 3 \quad 45 \\ (+) \quad 3 \quad 55 \\ \hline 100 \end{array} = \begin{array}{l} 60m + 40m \\ (1) \end{array}$$

Step 2:

$$\begin{array}{r} h \quad m \\ 3 \quad 45 \\ 3 \quad 55 \\ \hline 7 \quad 40 \end{array} = 7 \text{ hours } 40 \text{ minutes}$$



Steps to follow:

1. Add the minutes i.e $45 + 55 = 100$
2. As 100 minutes is equal to 60 minutes + 40 minutes = 1 hour + 40 minutes
3. Then 1h carry forward to hours place.
4. Add the contents in hours place i.e. $1h + 3h + 3h = 7h$

Example - 7

Bhavya is reading a book from 9:45 hours to 10.30 hours. Then how much time does she read ?

Bhavya started reading a book at = 9 h 45 m.

She completed it at = 10 h 30 m

Duration of the time = ?

h	m
9	60
10	30
9	45
0	45

= 0 hours 45 min



We can't subtract 45 min. from 30 min. Hence borrow 1 hour from 10 hrs, convert it as 60 min and add to 30 min, it becomes 90min. Now subtract 45 min from 90 min. Then subtract 9hours from 9 hours.

Time taken by Bhavya to read the book is = 45 minutes.

Do this:

Convert 1 hour 10 minutes 12 seconds into seconds.

Try this:

Find the number of seconds in...

- a) A day
- b) A week
- c) A month



Calendar:

Calendar 2020

January						
Su	M	Tu	W	Th	F	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

February						
Su	M	Tu	W	Th	F	Sa
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

March						
Su	M	Tu	W	Th	F	Sa
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

April						
Su	M	Tu	W	Th	F	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

May						
Su	M	Tu	W	Th	F	Sa
			1	2		
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

June						
Su	M	Tu	W	Th	F	Sa
		1	2	3	4	5
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

July						
Su	M	Tu	W	Th	F	Sa
		1	2	3	4	
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

August						
Su	M	Tu	W	Th	F	Sa
			1			
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

September						
Su	M	Tu	W	Th	F	Sa
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

October						
Su	M	Tu	W	Th	F	Sa
		1	2	3		
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

November						
Su	M	Tu	W	Th	F	Sa
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

December						
Su	M	Tu	W	Th	F	Sa
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

S. No.	Name of the Student	Birth date and Month	The day in the Calendar
1.	Hashini	15 th June	MONDAY

Example - 8

The age of Pavan is 14 years. His mother's age is 23 years older than Pavan. How old is his mother?

Solution: Pavan's age = 14 years

$$\begin{aligned}\text{Age of his mother} &= \text{Pavan's age} + 23 \text{ years} \\ &= 14 + 23 = 37 \text{ years}\end{aligned}$$

Example - 9

2. Amrutha's age is 9 years. Lavanya's age is 3 years more than Amrutha's age. Then what is Lavanya's age ?

Solution:

$$\text{Age of Amrutha} = 9 \text{ years}$$

$$\begin{aligned}\text{Lavanya's age} &= \text{Amrutha's age} + 3 \text{ years} \\ &= 9 \text{ years} + 3 \text{ years}\end{aligned}$$

$$\text{Lavanya's age} = 12 \text{ years}$$

Exercise - 10.5

1. Observe present year's calendar in your class and fill in the blanks in the following.

S. No.	Name of the Festival	Date	Day
1.	Diwali		
2.	Bhogi		
3.	Ramdan		
4.		August 15 th	
5.	Christmas		
6.		October 2 nd	
7.		December 25 th	
8.	Milad Un nabi		
9.	Children's Day		
10.		September 5 th	

2. Arrange the above mentioned festivals in the order as we see in the calendar.

a. _____ b. _____ c. _____ d. _____

e. _____ f. _____ g. _____ h. _____

3. From the above mentioned festivals,

a) Which festival comes at the beginning of the year?

b) Which festival comes at the end of the year?

4. Suman's age is 9 years and his father's age is 25 years more than Suman's age. Then how old is his father ?

5. Anand's age is 10 years and the age of his brother is less than 5 years of Anand. Find the age of his brother?

6. Rajitha is 9 years old. Her sister's age is twice that of Rajitha's. Then how old is Rajitha's sister?

7. Write the short form for the given date. One is done for you.

a) 3rd July 1975 = 03-07-1975

b) 16th August 1945 = c) 22nd March 1980 =

Project work :

Observe different medicine packets available at your home and write manufacturing (Mfg.) date and Expiry (Exp.) dates in the table given below.

S. No.	Name of the thing	Mfg. Date	Exp. Date

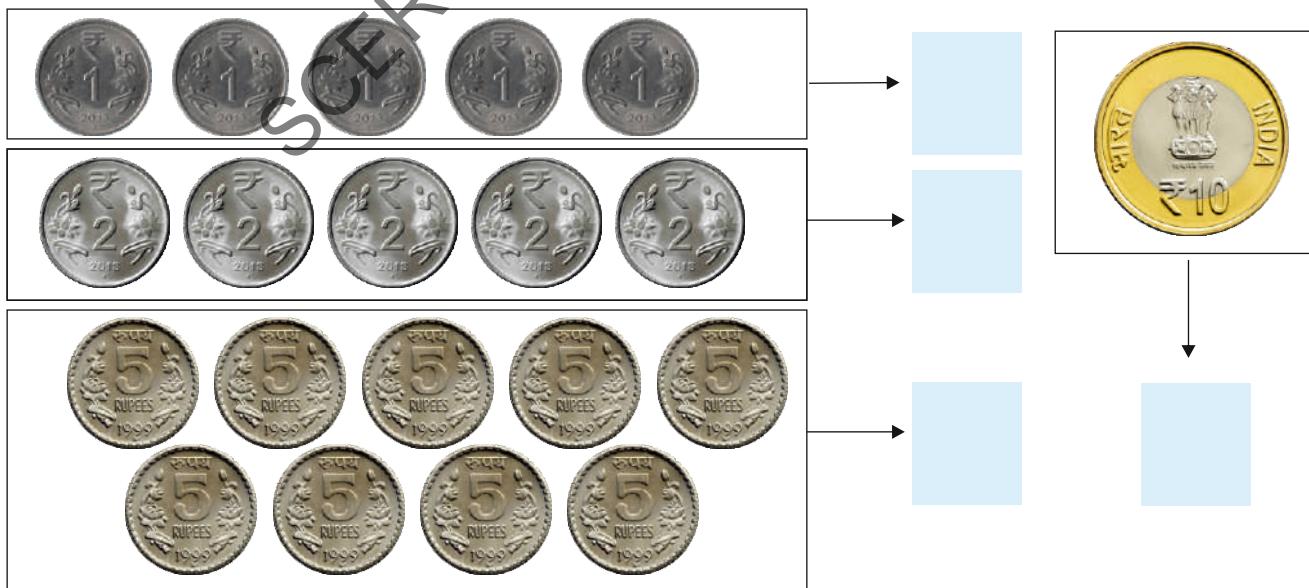
10.5 Our Money



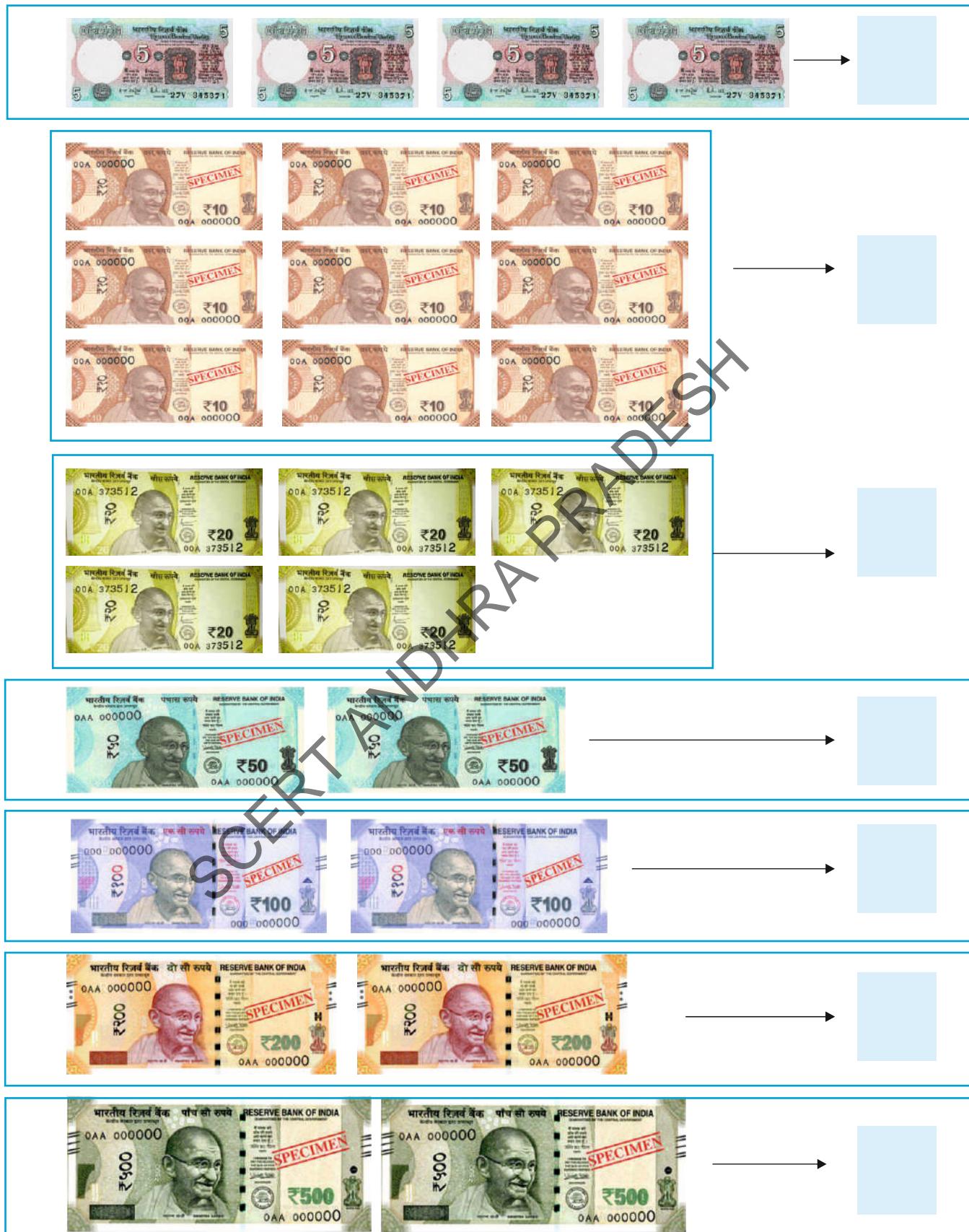
Charan's family wanted to go to 'Gram Devatha Utshavalu' in Kotabommali. During the celebrations, a big fair took place. Charan's father, Giri withdrew 3000 rupees from the bank and Charan's grandfather, Sivayya withdrew 2000 rupees from the post office for the celebrations.

Charan's mother Rajani, took all the amount from her savings. The coins and notes with Rajani are shown below. The money Rajani saved is shown hereunder. Let's count the coins and currency and write their value in the boxes provided.

Coins with Rajani:



Notes with Rajani:



Now find the total amount with Rajani :

Giri paid ₹ 900 to the shopkeeper for toy car in the fair.

Let's guess the currency notes given by Giri for ₹ 900 !

₹ 900 =

500 + 200 + 200

$$\text{₹ } 900 = 200 + 200 + \\ 200 + 200 + 50 + 50$$



$$\text{₹ } 900 = 500 + 200 + \\ 50 + 50 + 50 + 50$$



Do this:

Write the other ways for making ₹ 900 rupees with different denominations of currency.

a) ₹ 900 = _____

b) ₹ 900 = _____

Try this:

Use notes of Indian currency to make ₹ 900

900 = _____ + _____ + _____ + _____ + _____ + _____ + _____ + 5 + 2 + 2 + 1.

Sivayya bought a blanket and sweater at a total cost of ₹ 1685 and gave ₹ 2000 note to the shop keeper in the fair. The shopkeeper has no change for ₹ 2000 to return the balance amount to Sivayya. Then shopkeeper went to nearby shop for change of ₹ 2000.

Have you seen ₹ 2000 note ?

Now observe the ₹ 2000 note.



back



→ front

The shop keeper got the tendering money for ₹ 2000 as shown below.



Do this:

Paste the dummy currency notes in your note book whose total will be ₹ 2000 as in the box shown below.



Try this:

Use the Indian currency notes and coins and write denominations for ₹ 2000 in the blank ₹ 2000 = ₹ 500+ _____

Giri and his family bought a lot of things. Giri thought that the money with them may not be sufficient to pay the bill. Then Giri asked his friend Rajesh by phone to deposit ₹ 2000 to his account. Rajesh went to the bank to deposit ₹ 2000. He filled the deposit form as shown below. Observe the denominations for ₹ 2000 in the deposit form.

Do this:

Rajesh wrote denominations for ₹ 2000 in the above form. Now try to fill the below deposit form in another way for depositing ₹ 2000 in the bank.



Pay-in-Slip नामकरण		Comp. No. 1000990131 वार्षिक CASH / DEPOSIT TRANSFER
भारतीय स्ट्रेंच बैंक / State Bank of India, Treasury Branch-1867, IBM श्रीमद्भगवद्गीता का अध्ययन करने वाले वर्ष 1867 में बैंक का गढ़ बनाया गया। इसका उपर्युक्त नाम दिए गए हैं। <small>(NOTE: Please use separate slips for depositing cash, cheques, draft etc.)</small>		
<small>मात्र 10 दशमलव वाली रुपयों की वापसी वाली वार्षिक ब्याज दर 12% है।</small>		
Type of Account:	SB / CAU / RDU / CGC / TLD / DLO	Account No. 1000990131 Name _____ Date _____
ऐसे दस्तऐलावती रूप से जारी करने के लिए इस डिपोजिट स्लिप का उपयोग करें। LUNALAPU, G.R.I.		
यह दस्तऐलावती रूप से जारी करने के लिए इस डिपोजिट स्लिप का उपयोग करें। (May (दिनी) / Rupees (in words) Two Thousand Only		Date / Amount DD/MM/YY / Rs. _____/- Details of Cash / Cheque Overleaf यहाँ तक ताकि बैंक द्वारा आपका खाते में आपका चेक या रुपये का डिपोजिट किया जाए। यहाँ तक ताकि बैंक द्वारा आपका खाते में आपका चेक या रुपये का डिपोजिट किया जाए। Cash headings CGC/CAU after 10th instant column
Enter Name / Branch छांकना करने का कोड नं. (If Deposit is made for Non-Branch)		Enter Name / Branch छांकना करने का कोड नं. (If Deposit is made for Non-Branch)
अपराधी का नाम और ऑफिसर का नाम अपराधी का नाम / S.NO. द्वारा विवरित किया जाना चाहिए। Cash Officer / Passing Officer		अपराधी का नाम / FOR OFFICE USE ऑफिसर का नाम / Signature of an Officer
अपराधी का नाम / S.NO. द्वारा विवरित किया जाना चाहिए। Cash Officer / Passing Officer		अपराधी का नाम / Signature of an Officer

नकद / चेकों के विवरण / Details of Cash / Cheque deposited			नकद का विवरण / Details of Cash		
चेकों के विवरण Details of Cheque	शाखा / Branch	चेक नं. /Cheque No.	मात्रा / Amount Denomination	लाठी की संख्या No. of pieces	मूली / Amount Rs. /Rs. रु./P.
SBI SARAVAKOTA			2000	2000 x	1000
				500 x	2
				200 x	4
				100 x	2
				50 x	
				20 x	
				10 x	
				5 x	
				2 x	
				सुना / Coins	
				ग्राम / Gram	
				Total	2000

नकद / चेकों के विवरण / Details of Cash / Cheque Deposited				नकद का विवरण / Details of Cash		
चेकों के विवरण Details of Cheque	शाखा / Branch	चेक नं./Cheque No.	दर्शि / Amount	मूल्यवर्णन Denomination	बालों की रु. No.of pieces	दर्शि / Amount ₹. /Rs. रु. /JP.
			2000 x			
			500 x			
			200 x			
			100 x			
			50 x			
			20 x			
			10 x			
			5 x			
			2 x			
			सुनाए / Coins			
			जमा / Total			

In the fair Giri bought a shirt worth of ₹ 1250 for Pavan and a T-shirt worth of ₹ 980 for Charan. How much amount did Giripay to the shopkeeper ? Now let's calculate the total amount.



Cost of the shirt = ₹ 1250

Cost of the T-shirt = (+) ₹ 980

Total cost of the shirt and T-shirt = ₹ 2230

Giri paid ₹ 2230 to the shopkeeper.

Let's guess the notes given by Giri for ₹ 2230.



Example :

Sivayya bought a sweater for ₹ 1685 and gave ₹ 2000 to shopkeeper. How much amount did the shopkeeper returned Sivayya?

The shopkeeper gave the balance amount to Sivayya.

Let's calculate the amount the shop keeper returned to Sivayya

Amount given by Sivayya	=	₹ 2000
Cost of the blanket and sweater purchased by Sivayya	=	(-) ₹ 1685
Amount returned to Sivayya	=	₹ 315

Do this:

1. Govind spent ₹ 2585 on seeds and ₹ 4850 on fertilizers for growing a crop in his field. How much did he spend altogether?
2. Appala Naidu had bought a goat for ₹ 8950 and sold it for ₹ 9850. How much profit did he get?
3. Ratnalu borrowed ₹ 9000 from Gopal. The interest amount for the money became ₹ 1850. But Ratnalu has only ₹ 4965 with her. How much more money is needed to clear the debt?

Do you know?

The money used in a particular country is called its currency.

Indian currency is 'Rupees and paise'. We represent rupee as ₹ and paise as P.

PROJECT WORK

Each country has its own currency. Find out what the currencies of the following countries are called: Bangladesh, China, Japan, UK, Malaysia, Indonesia, USA...



S. No.	Name of the Country	Name of the Currency used
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		

Exercise - 10.6

- Fill in the blanks with suitable denominations for ₹ 2000.
 - $\text{₹} 2000 = \underline{\hspace{2cm}} + \text{₹} 500 + \text{₹} 500 + \text{₹} 200 + \text{₹} 200 + \text{₹} 100$
 - $\text{₹} 2000 = \text{₹} \underline{\hspace{2cm}} + \text{₹} \underline{\hspace{2cm}} + \text{₹} 500 + \text{₹} 500 + \text{₹} 500 + \text{₹} 200$
 - $\text{₹} 2000 = \text{₹} 500 + \text{₹} 500 + \text{₹} 500 + \text{₹} \underline{\hspace{2cm}} + \text{₹} \underline{\hspace{2cm}} + \text{₹} 100 + \text{₹} \underline{\hspace{2cm}} + \text{₹} 50.$
 - $\text{₹} 2000 = \text{₹} 200 + \text{₹} 200 + \text{₹} 500 + \text{₹} 100 + \text{₹} \underline{\hspace{2cm}} + \text{₹} \underline{\hspace{2cm}} + \text{₹} \underline{\hspace{2cm}} + \text{₹} 100.$
- Count the money.



- A fish vendor Komali, bought fishes for ₹ 5620 and sold it for ₹ 4985. How much loss did she get?
- Sailaja has ₹ 6450 and her mother has ₹ 2530. What is total amount they have? If they spent ₹ 5645 then how much money will be with them?

Glossary

Numeration	= సంఖ్యామానం	Loss	= నష్టం
Predecessor	= ముందు సంఖ్య	Multiplication	= గుణకారం
Successor	= తరువాత సంఖ్య	Multiplicand	= గుణ్యం
Thousand	= వేఱ	Multiplier	= గుణకం
Ten Thousand	= పది వేలా	Product	= లబ్దం
Comparison	= పోలిక	Multiple	= గుణిజం
Palindrom = ఇర్వైపులా ఒకే విధంగా వచ్చు పదం		Division	= భాగహారం
Riddle	= పొడుపు కథ	Divisor	= విభాజ్యం
Shuffle	= కలగలుపు	Dividend	= విభాజకం
Addition	= కూడిక	Quotient	= భాగఫలం
Sum	= మొత్తం	Remainder	= శేషం
Total	= మొత్తం	Shapes	= ఆకారాలు
Estimation	= అంచనా	Edge	= అంచు
Subtraction	= తీసివేత	Face	= ముఖం లేదా తలం
Withdraw	= ఉపసంహరించు	Corner	= మూల
Subtrahend	= వియోజకం	Vertical	= నిట్ట నిలువుగా
Minuend	= వియోజ్యం	Horizontal	= సమాంతరంగా
Difference	= తేడా లేదా బేధం	Rectangle	= దీర్ఘచతురప్రణం
Profit	= లాభం	Square	= చతురప్రణం

Triangle	= త్రిభుజం	Measuring Jar	= కొల పొత్త
Diagonal	= కఱ్చం	Fraction	= భిన్నం
Netforms	= వల రూపాలు	Equal Parts	= సమాన భాగాలు
Pandal	= పందిరి	Numerator	= లవం
Perimeter	= చుట్టు కొలత	Denominator	= హోరం
Grid Paper	= గళ్ళ కాగితం	Unit Fraction	= ఏకాంక భిన్నం
Area	= వైశాల్యం	Like Fraction	= సజాతి భిన్నం
Circle	= వృత్తం	Unlike Fraction	= విజాతి భిన్నం
Centre of the circle	= వృత్త కేంద్రం	Data Handling	= దత్తాంశ నిర్వహణ
Radius	= వ్యాసం	Data Interpretation	= దత్తాంశ వ్యాఖ్యానం
Diametre	= వ్యాసం	Data Presentation	= దత్తాంశ ప్రదర్శన
Circumference	= వృత్త పరిధి	Tally Marks	= గణన చిహ్నాలు
Metre Scale	= మీటరు స్కేలు	Pictograph	= పట చిత్రం
Tape	= టెప్ప	Bargraph	= కమ్మింగ్ బా చిత్రం
Length	= పొడవు	Height	= ఎత్తు
Crop Bod	= పంట కాలువ	Breadth	= వెడల్పు
Weight	= బరువు	Half	= సగం
Simple Balance	= సాధారణ త్రాను	Quarter	= నాల్గవ భాగం
Measuring Stones	= తూనిక రాళ్ళు	Hour	= గంట
Capacity	= పరిమాణం	Minute	= నిమిషం