Maths World

Class 5

R1D4I7

ਪੜ੍ਹੋ ਸਾਰੇ ਵਧੋ ਸਾਰੇ

ਸਿੱਖਿਆ ਅਤੇ ਭਲਾਈ ਵਿਭਾਗ, ਪੰਜਾਬ ਦਾ ਸਾਂਝਾ ਉਪਰਾਲਾ

Punjab School Education Board

Sahibzada Ajit Singh Nagar

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ਇਹ ਪੁਸਤਕ ਵਿਕਰੀ ਲਈ ਨਹੀਂ ਹੈ।

Secretary, Punjab School Education Board, Vidya Bhawan, Phase-8, Sahibzada Ajit Singh Nagar-160062 and Printed by Mangat Ram Printing Press, Jalandhar.

FOREWORD

The Punjab School Education Board has been continuously engaged in developing syllabi, producing and renewing text books according to the changing educational needs at the state and national level.

This book has been developed in accordance to the guidelines of National Curriculum Framework (NCF) 2005 and PCF 2013, after careful deliberations in workshops involving experienced teachers and experts from the board and field as well. All efforts have been made to make this book interesting with the help of activities and coloured figures. This book has been prepared with the joint efforts of subject experts of Board, SCERT and experienced teachers/experts of mathematics. Board is thankful to all of them.

The authors have tried their best to ensure that the treatment, presentation and style of the book in hand are in accordance with the mental level of the students of class V. The topics, contents and examples in the book have been framed in accordance with the situations existing in the young learner's environment. A number of activities have been suggested in every lesson. These may be modified, keeping in view the availability of local resources and real life situations of the learners.

I hope the students will find this book very useful and interesting. The Board will be grateful for suggestions from the field for further improvement of the book.

Chairman

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CONTENT

Learning Outcomes

The learner

- Works with large numbers
  - reads and write numbers bigger than 1000 being used in her / his surroundings.
  - performs four basic arithmetic operations on numbers beyond 1000 by understanding of place value of numbers.
  - divides a given number by another number using standard algorithms.
  - estimate sum, difference, product and quotient of numbers and verifies the same using different strategies like using standard algorithms or breaking a number and then using operation. For example, to divide 9450 by 25, divide 9000 by 25, 400 by 25, and finally 50 by 25 and gets the answer by adding all these quotients.
- acquires understanding about fractions
  - finds the number corresponding to part of a collection
  - identifies and forms equivalent fractions of a given fraction
  - expresses a given fraction 1/2,1/4,1/5 in decimal notation and vice-versa. For example, in using units of length and money-half of Rs.10 is Rs 5.
  - converts fractions into decimals and vice versa
- explores idea of angles and shapes
  - classifies angles into right angle, acute angle, obtuse angle and represents the same by drawing and tracing
  - identifies 2D shapes from the immediate environment that have rotation and reflection symmetry like alphabet and shapes
  - makes cube, cylinder and cone using nets designed for this purpose
- relates different commonly used larger and smaller units of length, weight and volume and converts larger units to smaller unites and vice-versa
- estimates the volume of a solid body in known units like volume of a bucket is about 20 times that of a mug
- applies the four fundamental arithmetic operations in solving problems involving money, length, mass, capacity and time intervals
- identifies the pattern in triangular number and square number
- collects data related to various daily life situations, represents it in tabular form and as bar graphs and interprets it.

Chapter-1

Numbers

Objectives :

- To teach students to read, write and make them understand the numbers upto 1,00,000.
- To provide information, how the numbers are used in our exchange of goods daily activities like buying-selling etc.
- To provide information of place value and face value.
- To provide information of successor-predecessor, increasing-decreasing order and comparison of numbers.
- Formation of the greatest and the smallest numbers with different digits.

Recap

1.1 Revision of the workdone in previous class

In previous classes, the students have learnt reading and writing of numbers upto 10,000 and their use in day-to-day life. The teacher will create an environment by discussing examples from day-to-day life. For example:

Activity

Teacher - Students, in which year was the Khalsa Panth founded by Shri Guru Gobind Singh Ji ?

Students - In 1699 on the occasion of Baisakhi.

Teacher - Very good! Now, read this year and then write in words in your notebooks. (The teacher will write 1699 on the blackboard).

Students - The students will read one by one and then write one thousand six hundred ninety nine in their notebooks.

Teacher - Now, write the present year in figures & words. on your notebooks.

Students - 2022-Two thousand twenty two. (Write in numerals the current year)

Teacher - Now, do the following sums in your notebooks.

1. Write the following numbers words in figures :

(a) 968 (b) 6908 (c) 1328 (d) 9002 (e) 9999

2. Write the following numbers in figures :

(a) Six hundred seventy eight (b) One thousand seven hundred

(c) Four thousand six (d) Eight thousand eight hundred eighty six

(e) Nine thousand ninety

Discussion between Teacher and Students

For the revision of new concepts, the teacher will make base through discussion.

The teacher indicates towards fan or bulb in the class and will ask a student its approximate price.

Simarjeet - The price of this fan is approximately ₹ 1200.

Teacher - Very good ! (To Gurfateh) Can you tell me the price of the bulb ?

Gurfateh - Yes Sir, approximately ₹ 10.

Teacher - Can you tell which object costs more ?

Other Students - The cost of fan is greater than the cost of bulb.

Teacher - Means, 1200 is greater than 10 i.e. (1200 > 10)

Students - Yes Sir

Teacher - (Pointing towards the wall clock)

Now tell me the price of this wall clock.

Mahinder - Sir, its price is approximately ₹ 200.

Teacher - Very good ! now, write down the cost of these objects in increasing order.

Students will write the costs in increasing or decreasing order. The teacher willl give more questions for practice.

3. Compare the following numbers using >,<, or = signs.

(a) 238 ☐ 832 (b) 7851 ☐ 8715

(c) 2018 ☐ 2018 (d) 9999 ☐ 9900

(e) 4651 ☐ 5467 (f) 5867 ☐ 6325

4. Write the following numbers in ascending order (smallest to greatest) :

(a) 245, 751, 654, 456, 199

(b) 1234, 7806, 4123, 5006, 2413

(c) 3344, 4455, 1122, 2233, 5566

(d) 6780, 6078, 6870. 8760, 7806

(e) 3299, 5699, 9932, 9999, 6099

5. Write the following in descending order (greatest to smallest) :

(a) 542, 751, 614, 406, 129

(b) 2234, 7906, 5123, 8006, 6413

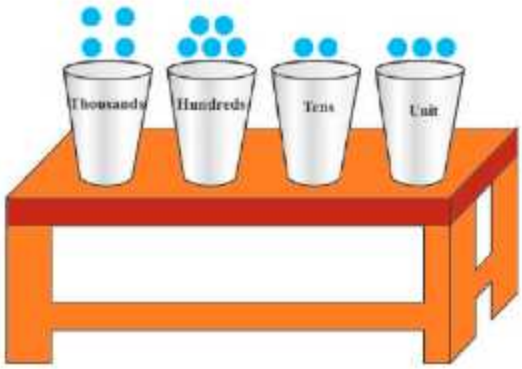
(c) 3345, 3456, 1132, 1233, 5066

(d) 6781, 6178, 6570, 6460, 6806

(e) 1299, 1669, 1932, 1909, 1099

Activity for revision of the place value and expanded form of numbers :

Teacher will put four paper glasses on the table labelled with place values as shown in the figure :



Teacher will put 3 marbles in the glass at ones place, 2 marbles in the glass at tens place, 5 marbles in the glass at at hundreds place and 4 marbles in the glass at thousands place. This activity will be done by calling any four students :

1st Student - Takes out 4 marbles from thousands place value glass and will speak, 4000 and writes the place value on the black board : $4 \times 1000 = 4000$

2nd Student - Takes out 5 marbles from hundreds place value glass will speak the number 500 and writes on the blackboard : $5 \times 100 = 500$

3rd Student - Takes out 2 marbles from tens place value glass and will speak the number 20 and writes on the blackboard : $2 \times 10 = 20$

4th Student - Takes out 3 marbles from unit (ones) place glass and will speak the number 3 and writes on the blackboard : $3 \times 1 = 3$

The teacher will write this on the blackboard.

$4000 + 500 + 20 + 3 = 4523$

Teacher will teach place value, expanded form and greatest-smallest number from different digits with this activity and will revise with the help of the following questions.

6. Write the place value of underlined digit :

(a) 7$\underline{8}$9 (b) 2$\underline{7}$82 (c) 781$\underline{9}$ (d) 548$\underline{9}$ (e) 70$\underline{0}$9

7. Write in expanded form :

(a) 492 (b) 1280 (c) 3009 (d) 8765 (e) 9020

8. Form the greatest and smallest numbers by using the following numbers:

(a) 2, 0, 9 (b) 1,2,3,4, (c) 5, 6, 1, 2

(d) 2, 4, 0, 9 (e) 1,7,8,6

9. Follow the pattern and fill in the blanks.

(a) 110, 210, 310, 410, _____ , _____ , _____

(b) 2018, 2019, 2020, 2021, _____ , _____ , _____ , _____

(c) 1220, 1190, 1160, 1130, _____ , _____ , _____ , _____

(d) 1110, 1220, 1330, 1440, _____ , _____ , _____ , _____

(e) 5800, 5850, 5900, 5950, _____ , _____ , _____ , _____

10. Round off to the nearest tens and hundreds of the following :

(a) 96 (b) 209 (c) 652 (d) 787 (e) 975

11. Fill in the blanks

1 digit smallest number = _____

2 digits smallest number = _____

3 digits smallest number = _____

4 digits smallest number = _____

5 digits smallest number = _____

6 digits smallest number = _____

1 digit greatest number = _____

2 digits greatest number = _____

3 digits greatest number = _____

4 digits greatest number = _____

5 digits greatest number = _____

1.2 Recognition of Greater Numbers

(Discussion between the teacher and the students)

Teacher - What is the population of your village ? Write on the blackboard and read it in words.

Manu - Sir, our village's population is 1598 (one thousand five hundred ninety eight).

Simran - Sir, our village's population is 1248 (one thousand two hundred forty eight).

Teacher - What is the population of your district ?

Anmol - Sir, population of our district is more than our village.

Teacher - Can any other student guess the population of our district ?

Student - No, sir

Teacher - (Writes on the blackboard) Students. The population of our district is 716648. Can anyone read this in words ? Now, students will not be able to read this. So, the teacher will tell them that they have learnt numbers upto 10,000 only in their previous classes, so they will not be able to read this.

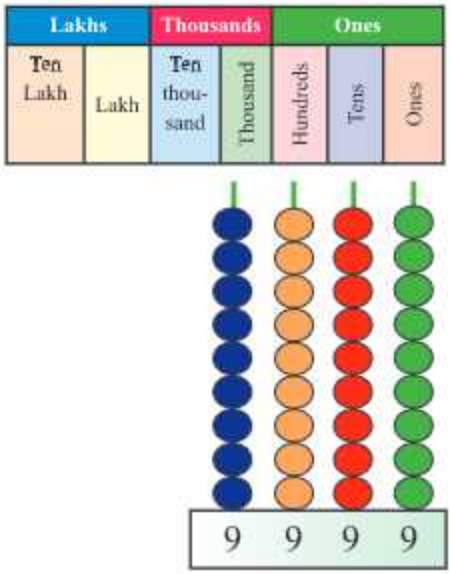
Now they are going to read and write numbers greater than 10,000.

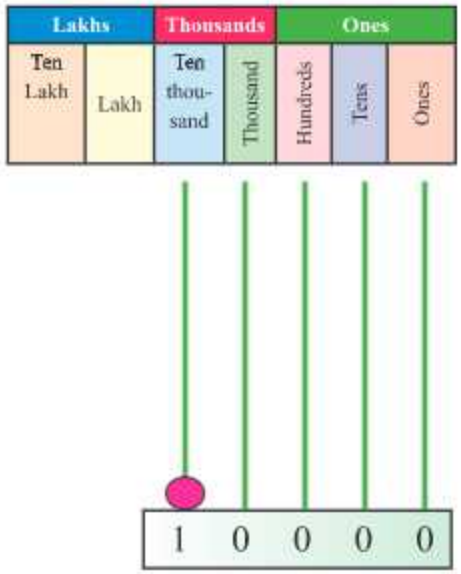
1.2.1 Reading and Writing of Greater Numbers

Now we will learn representation of greater numbers, on abacus, expanded form, successor-predecessor etc.

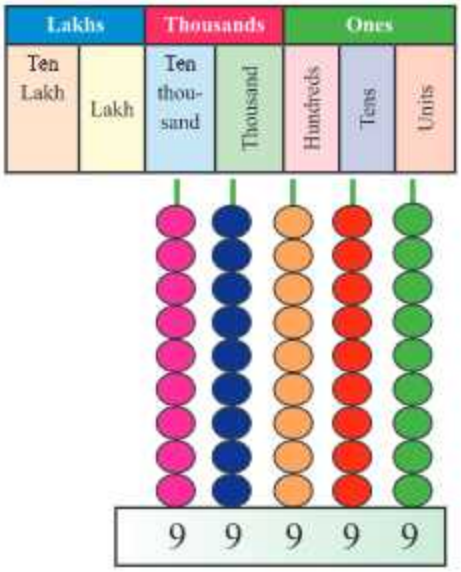
Activity

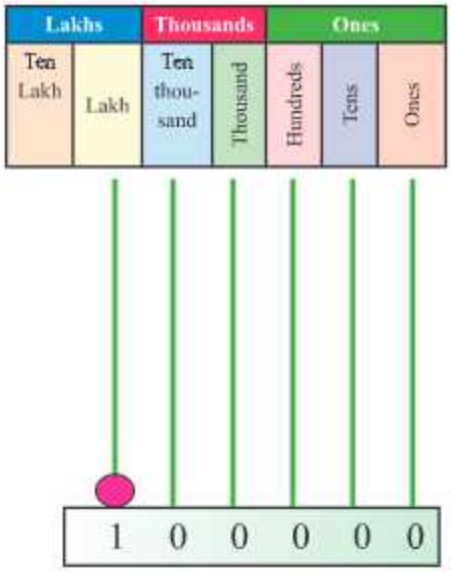
Students have learnt upto 9999 through abacus in their previous classes. Now, the teacher will ask a student to add one more bead to the abacus and will observe the student's reaction.





With this activity, we will arise the curiousity of students for learning next natural numbers





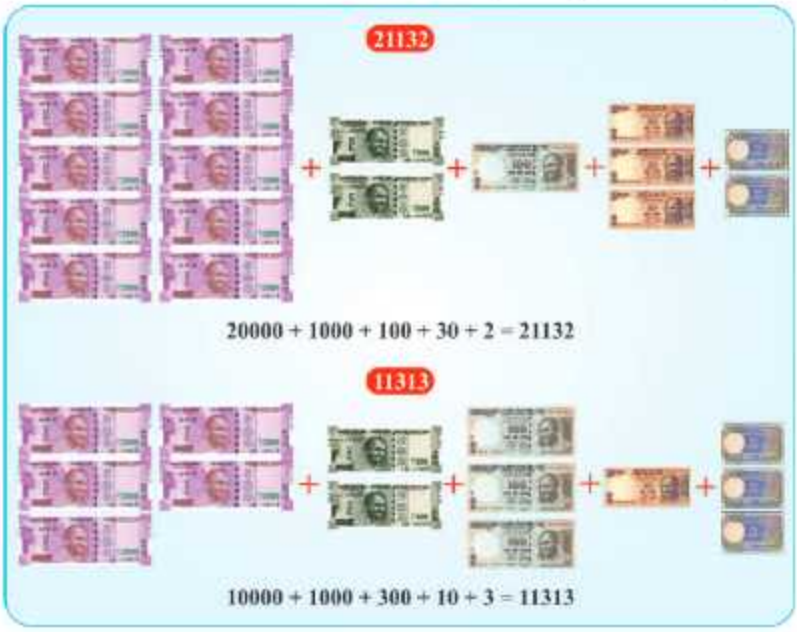
9	99	999	9999	99999
+ 1	+ 1	+ 1	+ 1	+ 1
10				

Following numbers can also be written in this way.

9999+1=10000	29999+1=30000	49999+1=50000	69999+1=70000	89999+1=90000
19999+1=20000	39999+1= 40000	59999+1=60000	79999+1=80000	99999 + 1=100000

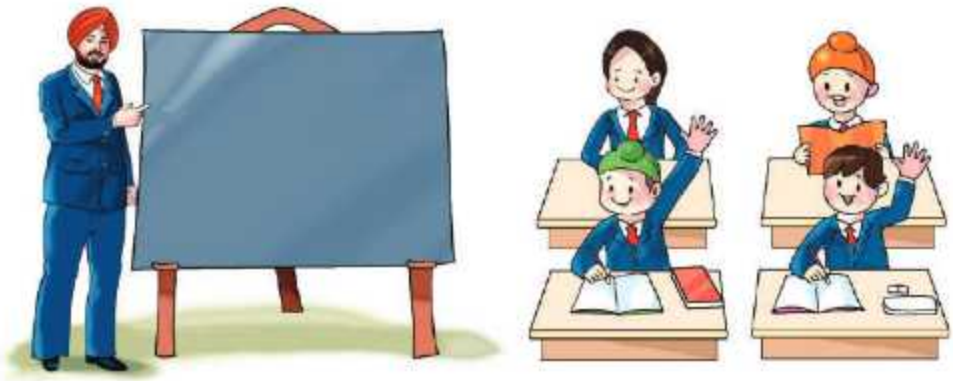
Students can read greater numbers with the help of currency notes as well. Look at the following example :

Example : Make ₹ 21132 and ₹ 11313 by using currency notes.



In this way, the teacher will teach the students to write more numbers by using currency notes.

1.2.2 Knowing the predecessor and successor of greater numbers (Discussion of teacher with the students)



Teacher will discuss predecessor and successor of numbers with the help of the following activity :

In which year did India get Independence ?

1947 

Which year comes before the year of Independence of India ?

1946 

Which year comes after the year of the Independence of India ?

1948 

After this discussion, teacher will tell the students that year before 1947 was 1946, which is the predecessor of 1947 and year after 1947 was 1948, which is the successor of 1947.

For successor, 1 is added to the given number and for predecessor, 1 is subtracted from the given number.

In this way, we can write the successor and predecessor of any greater number.

Example 1 : Shri Guru Nanak Dev Ji was born in 1469. Write the successor and predecessor of 1469.

Solution : Successor of 1469 = 1469 + 1 = 1470

Predecessor of 1469 = 1469 – 1 = 1468

Example 2 : Write the successor and predecessor of 54699.

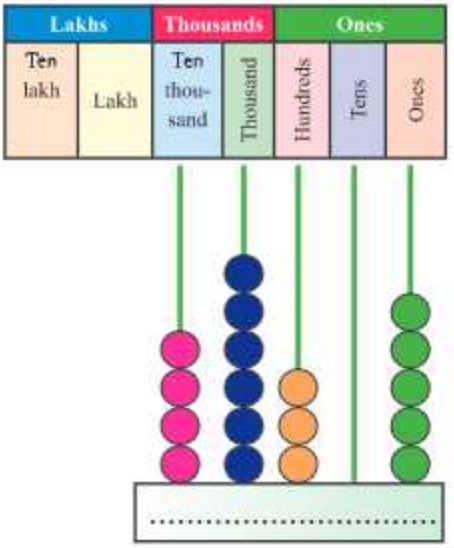
Solution : Successor of 54699 = 54699 + 1 = 54700

Predecessor of 54699 = 54699 –1= 54698

Exercise 1.1

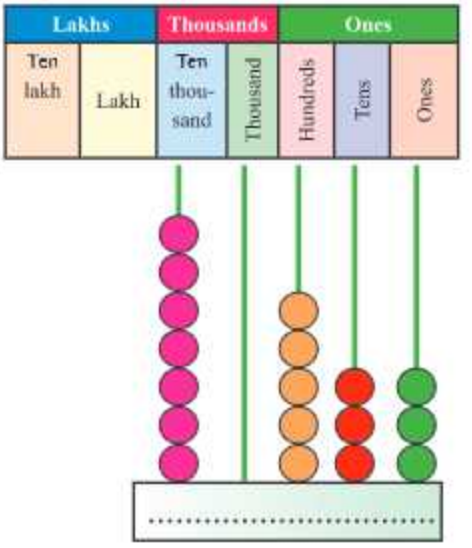
1. Read the abacus and write the numbers.

(a)



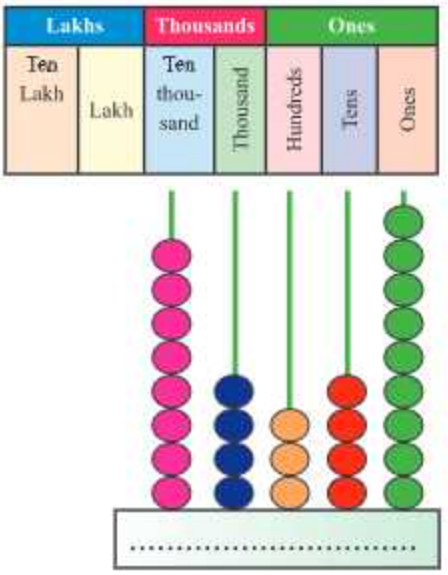
In words .....

(b)



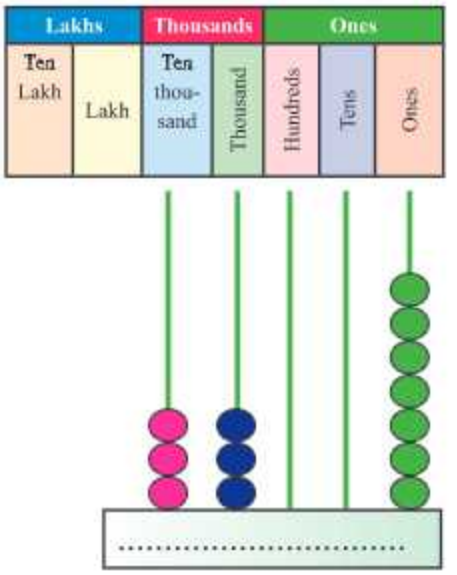
In words .....

(c)



In words .....

(d)



In words .....

2. Write the following numbers using place value chart :

(a) 3868 (b) 17605 (c) 41123 (d) 92856

(e) 20203 (f) 99728

3. Write in words :

(a) 2462 (b) 8988 (c) 19050 (d) 33006

(e) 20198 (f) 59045 (g) 68390

4. Write the following numbers in figures :

(a) One thousand seven hundred forty five.

(b) Thirty three thousand eight hundred seventy five.

(c) Seventy seven thousand seventy seven.

(d) Fifty thousand five hundred five.

(e) Ninety thousand eight hundred six.

(f) Eighty thousand eight hundred eighty.

(g) One lakh.

5. Write the successor of the following numbers :

(a) 998 (b) 10000 (c) 2018 (d) 99999

(e) 48675 (f) 40009

6. Write the predecessor of the following numbers :

(a) 24855 (b) 99999 (c) 39999 (d) 79890

(e) 50000 (f) 23456

1.3 Place Value and Face Value of greater numbers.

We have learnt the place value of smaller numbers upto 1000 in the previous classes. Now, we will learn the place values of numbers greater than 1000.

In any number, by changing the position of the digits, their place values are also charged but their face value remains the same.

Hundreds	Tens	Ones
1	2	3

A
↓
123

Hundreds	Tens	Ones
3	2	1

B
↓
321

In the above diagram, when the place values of the digits are interchanged, their values are also changed.

In diagram A : We have 1 on hundreds place, 2 on tens place and 3 on ones (unit) place.

So, the number is $1 \times 100 + 2 \times 10 + 3 \times 1 = 100 + 20 + 3 = 123$

In diagram B : When places of the digits are changed, then their values are also changed.

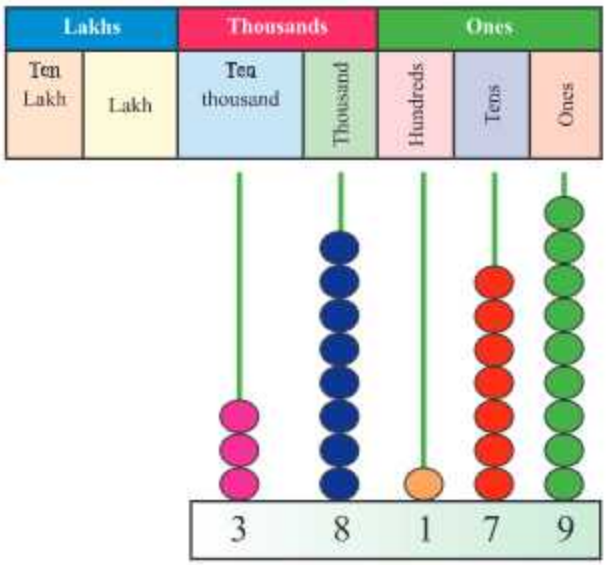
So, the number is $3 \times 100 + 2 \times 10 + 1 \times 1 = 300 + 20 + 1 = 321$

So, we conclude that when we change the places of digits their face values remain the same but place values are changed.

1.3.1 Place value and Face value of numbers

In this section, we will learn to write the place and face value of numbers as given in examples :

Example 1 : Write the place and the face value of the number 38179



Solution :

- On abacus, 9 is on ones place, so place value of 9 is $9 \times 1 = 9$ and face value of '9' is 9.
- On abacus, 7 is on tens place, so place value of 7 is $7 \times 10 = 70$ and face value of '7' is 7.

- On abacus, 1 is on hundreds place, so place value of 1 is $1 \times 100 = 100$ and face value of '1' is 1.
- On abacus, 8 is on thousands place, so place value of 8 is $8 \times 1000 = 8000$ and face value of '8' is 8.
- On abacus, 3 is on ten thousands place, so place value of 3 is $3 \times 10{,}000 = 30{,}000$ and face value of '3' is 3.

Example 2 : Find the place and face value of every digit in the given number 75698.

Solution : In the number 75698.

Place value of $8 \times 1 = 8$ and face value is 8.

Place value of 9 is $9 \times 10 = 90$ and face value is 9.

Place value of 6 is $6 \times 100 = 600$ and face value is 6.

Place value of 5 is $5 \times 1000 = 5000$ and face value is 5.

Place value of 7 is $7 \times 10000 = 70000$ and face value is 7.

In any number and at any place, the place value of 0 is always 0.

Example 3 : Write the place values of all digits of 42359.

Solution : In the number 42359,

Place value of $9 = 9 \times 1 = 9$

Place value of $5 = 5 \times 10 = 50$

Place value of $3 = 3 \times 100 = 300$

Place value of $2 = 2 \times 1000 = 2000$

Place value of $4 = 4 \times 10000 = 40000$

Example 4 : Write the place values of all digits of 59023.

Solution : In the number 59023,

Place value of $3 = 3 \times 1 = 3$

Place value of $2 = 2 \times 10 = 20$

Place value of $0 = 0 \times 100 = 0$

Place value of $9 = 9 \times 1000 = 9000$

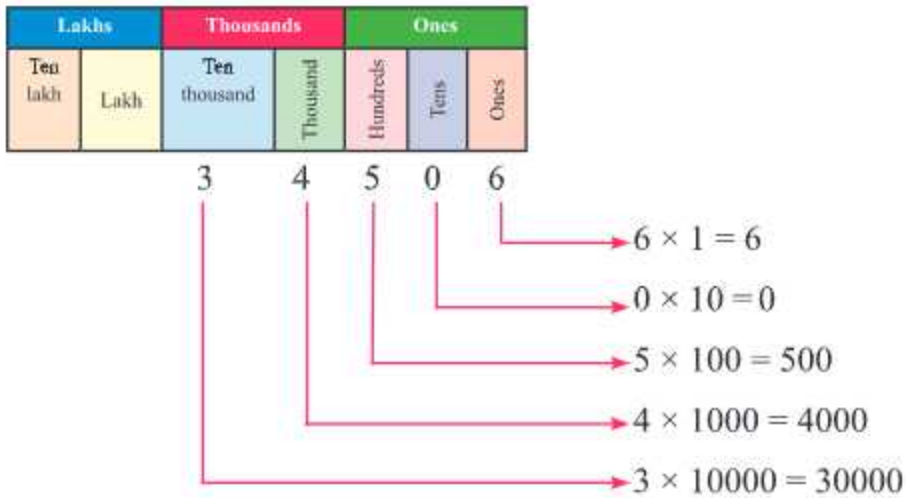
Place value of $5 = 5 \times 10000 = 50000$

1.3.2 Expanded form of Numbers

We have learnt the place values of digits in the numbers. Now, we will learn the expanded form of the numbers by using place values.

Example 1 : Write 34506 in expanded form.

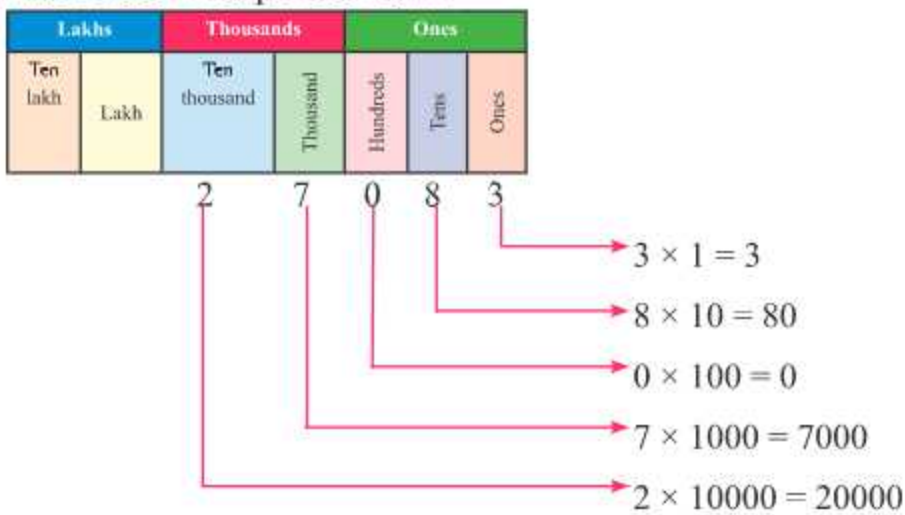
Solution :



Expanded form of 34506 = 30000 + 4000 + 500 + 6

Example 2 : Write 27083 in expanded form.

Solution :



Expanded form of 27083 = 20000 + 7000 + 80 + 3

Example 3. Write 98604 in expanded form.

Solution : Expanded form of 98604 = 90000 + 8000 + 600 + 4

Example 4. Write the following numbers in standard form :

(a) 20000 + 7000 + 800 + 90 + 6

(b) 80000 + 6000 + 60 + 8

Solution : (a) 20000+7000+800+90+6 = 27896

(b) 80000+6000+60+8 = 86068

Exercise 1.2

1. Write the place value of underlined digits in the following numbers :

(a) 83$\underline{2}$6 (b) 5$\underline{4}$588 (c) 9000$\underline{8}$ (d) $\underline{9}$9234

(e) 49$\underline{7}$16 (f) 4$\underline{7}$168 (g) $\underline{6}$3184 (h) $\underline{2}$9999

2. Write the face value of underlined digits in the following numbers :

(a) 8223$\underline{2}$ (b) 5$\underline{4}$180 (c) 908$\underline{1}$1 (d) 12$\underline{9}$94

(e) 1197$\underline{3}$ (f) 24$\underline{7}$16 (g) 11$\underline{6}$31 (h) $\underline{5}$9999

3. Write the following numbers in the expanded form :

(a) 232 (b) 4180 (c) 27811 (d) 82994

(e) 10073 (f) 43710 (g) 61639 (h) 26999

1.4 Comparison of Numbers

In last section, we have learnt the place value and expanded form of numbers. Now, we will compare the numbers.

Activity

₹ 890

₹ 560

Teacher - Students, which of these costs more ?

Rajni - Tape-recorder, ₹ 890 (Eight hundred ninety)

₹ 560

₹ 10500

Teacher - Students, Which of these costs less ?

Babli - Radio, ₹ 560 (Five hundred sixty)



₹ 560 ₹ 10500 ₹ 32500

Teacher - Students, which is the costliest of all ?

Sandeep - Refrigerator, ₹ 32500 (Thirty two thousand five hundred)




₹ 2500 ₹ 560 ₹ 10500 ₹ 32500

Teacher - Students, arrange these articles in increasing (ascending) order according to their prices.

Simerjeet - ₹ 560, ₹ 2500, ₹ 10500, ₹ 32500

Teacher - (To Paras), arrange these articles in decreasing (descending) order according to their price.

Paras - ₹ 32500, ₹ 10500, ₹ 2500, ₹ 560

After this activity, the teacher will explain the rules of comparison of numbers to the students.

RULES OF COMPARISON :

Rule-1

If the number of digits in any number is more than the number of digits in other number, then the number with more digits is greater than the number with less digits.

For Example : (a) $812 < 1243$ [Because 1243 has more digits]

(b) $3398 < 32365$ [Because 32365 has more digits]

(c) $99999 < 100000$ [Because 100000 has more digits]

Rule-2

If two numbers have the same number of digits, we compare them by looking at the place value of the first digit. If the place value of the first digit is same, then we will check the place value of the next digit and so on.

For Example : (a) $48213 > 37813$ [4 is greater than 3 in ten thousands place]

(b) $23208 < 25360$ [5 in greater than 3 in thousands place]

(c) $70482 > 70382$ [4 is greater than 3 in hundreds place]

(d) $23451 < 23482$ [8 is greater than 5 in tens place]

Example 1. Write the greatest and smallest number from the following numbers:

70884, 90306, 30245, 93675, 65009

Solution : Greatest number = 93675

Smallest number = 30245

Example 2. Write the numbers in increasing (ascending) order :

8457, 651, 5983, 61004, 90023

Solution : $651 < 5983 < 8457 < 61004 < 90023$

Example 3. Write the numbers in decreasing (descending) order :

55555, 55005, 50505, 50050, 50555

Solution : $55555 > 55005 > 50555 > 50505 > 50050$

Example 4. Write the 5-digits greatest and smallest number using digits 2, 3, 5, 8 and 7.

Solution : 5-digit-greatest number = 87532

5-digit-smallest number = 23578

Example 5. Write 5-digits greatest and smallest number using digits 1, 0, 9, 8 and 3.

Solution : 5-digit-greatest number = 98310

5-digit-smallest number = 10389

Exercise 1.3

1. Fill in the blanks using >, <, or = :

(a) 8072 ☐ 1872 (b) 9876 ☐ 6789

(c) 21916 ☐ 29161 (d) 40237 ☐ 32234

(e) 35003 ☐ 35003 (f) 60104 ☐ 60140

(g) 52838 ☐ 45885 (h) 9999 ☐ 100000

2. Write the greatest number from the following numbers:

(a) 8172, 2578, 8127, 8728, 8527

(b) 60060, 66006, 60600, 66660, 60006

(c) 58031, 13258, 35185, 81135, 86311

(d) 47443, 73434, 44473, 74437, 34474

(e) 872, 31827, 5183, 31725, 40426

3. Write the smallest number from the following :

(a) 9064, 7372, 8938, 9746, 9942

(b) 81018, 80108, 80810, 18018, 10018

(c) 32334, 23443, 24334, 33342, 32343

(d) 927, 39272, 93227, 46238, 27999

(e) 43148, 44813, 48134, 34148, 13481

4. Arrange the following numbers in ascending order :

(a) 9036, 6309, 9610, 699, 1000

(b) 37492, 94713, 49273, 61047, 52364

(c) 63918, 36829, 45261, 61514, 63819

(d) 36118, 70225, 27052, 36343, 52073

(e) 28136, 28236, 28853, 28534, 28435

5. Arrange the following numbers in descending order :

(a) 7084, 8084, 4048, 5074, 6785

(b) 61272, 71262, 51721, 41112, 62271

(c) 72280, 82720, 87220, 82270, 28780

(d) 99063, 93083, 94835, 99093, 96039

(e) 83226, 86203, 28306, 28603, 27503

6. Write the greatest and smallest 5-digits numbers using digits 6, 7, 8, 4 and 1.

7. Write the greatest and smallest 5-digits numbers using digits 5, 8, 3, 0 and 9.

8. Write the greatest and smallest 5-digits numbers using different digits.

1.5 Rounding off numbers

We have learnt rounding off numbers to the nearest tens and hundreds in previous class.

For example, rounding off 48 to the nearest tens is 50 and rounding off 514 to the nearest hundreds is 500.

Similarly, we shall learn the rounding off to the nearest thousands and to nearest lakhs so on.

Rules of Rounding off to the nearest 10 :

- To round off a number to the nearest tens, if ones digit is 5 or more than 5 then increase tens digit by 1 and place 0 at ones place.
- If ones digit is less than 5, then without changing tens digit, place 0 units digit.

Similarly, to round off a number to the nearest hundreds, we check tens digit and to the nearest thousands, we check hundreds digit using these rules, a number can be rounded off to the nearest tens thousands/lakh/ten lakh and so on. For example:

- Rounding off 360 to the nearest hundreds : 360 is more nearer to 400 than to 300, so round off 360 to the nearest hundreds is 400.

- Rounding off 3350 to the nearest thousands :

  3350 is more nearer to 3000 than 4000, so the number is rounded off to the nearest thousand i.e., 3000.

If you want to round off thousands put three zeroes to the right.
Look hunadreds digit if it is five to nine
Add a unit to thousand to shine.

Look hundreds for thousands
For hundreds look the tens
If you want to round off tens
We should look the ones

Example 1. Round off 256 to the nearest tens.

Solution : In the number 256, ones digit is 6 which is greater than 5, so, tens digit 5 is increased by 1 and unit digit will be 0.

Required number = 260

Example 2. Round off 850 to the nearest hundreds.

Solution : In the number 850, tens digits is 5.

So, hundreds digits 8 is increased by 1 and ones, tens digits will be 0.

Required number = 900.

Example 3. Round off 8756 to the nearest thousands.

Solution : In 8756, hundreds place digits is 7 which is more than 5.

So, required number = 9000

Example 4. Round off 10809 to the nearest 10000.

Solution : In 10809, thousands place digit is 0 which is less than 5.

So, required number = 10000

Exercise 1.4

1. Round off the following numbers to the nearest tens.

(a) 270 (b) 809 (c) 6465 (d) 9782

(e) 908 (f) 100 (g) 25338 (h) 1756

2. Round off the following numbers to the nearest hundreds.

(a) 325 (b) 875 (c) 990 (d) 4580

(e) 568 (f) 63535 (g) 85972 (h) 75069

3. Round off the following numbers to the nearest thousands.

(a) 7890 (b) 8901 (c) 45982 (d) 5650

(e) 63520 (f) 50460 (g) 60008 (h) 9999

4. Round off the following numbers to the nearest ten thousands.

(a) 27900 (b) 80901 (c) 46580 (d) 12550

(e) 99998 (f) 10001 (g) 23235 (h) 23568

5. Round off the following numbers to the nearest tens, nearest hundreds, and nearest thousands.

(a) 1625 (b) 1982 (c) 25200 (d) 21218

(e) 35462 (f) 39126 (g) 65915 (h) 99199

6. Write the smallest and greatest number that can be rounded off to the nearest thousand, to get 5000 ?

7. If the rounding off of 341 to the nearest tens is 340 write all the numbers while rounding off to the nearest tens which give the figure of 340 ?

For Teacher :- Activities, exercises, examples in this chapter are just for hints. The teacher can change these according to the need, time, place and can also improve them. The teacher can also give some new numbers for maximum practice.

Multiple Choice Questions (MCQs)

1. **Write the successor of the greatest 5-digit number.**

   (a) 99999 (b) 10000 (c) 100000 (d) 9999

2. **How many 2-digits numbers are there ?**

   (a) 99 (b) 90 (c) 100 (d) 89

3. **How many 5-digits numbers are there ?**

   (a) 99999 (b) 9000 (c) 10000 (d) 90000

4. **Smallest 5-digits number using digits 4, 6, 8, 9, 0 is :**

   (a) 46890 (b) 04689 (c) 98640 (d) 40689

5. **Fifty nine thousand fifty nine = _____.**

   (a) 59590 (b) 5959 (c) 59059 (d) 59509

6. **Choose the place value of 6 in 26573.**

   (a) 60000 (b) 6000 (c) 6 (d) 60

7. **Standard form of 20000 + 5000 + 30 + 4 is**

   (a) 25304 (b) 25034 (c) 20534 (d) 25043

8. **Greatest 5-digits number by using digits 7, 8, 6, 7, 9**

   (a) 67879 (b) 98767 (c) 98776 (d) 98677

9. **Out of the following numbers, which number has the place value of 8 is 8000 ?**

   (a) 35832 (b) 43248 (c) 54682 (d) 48054

10. **Write 48 in Roman Numerals.**

    (a) LVIII (b) LXVIII (c) XLVIII (d) XVIIIL

11. **Write 85 in Roman Numerals.**

    (a) LXXV (b) XXCV (c) XVC (d) LXXXV

12. **Which is predecessor of 10000 ?**

    (a) 9999 (b) 999 (c) 99999 (d) 1000

13. Roman numeral of 94 is.

(a) CVI (b) XCVI (c) XCIV (d) XICV

14. Choose the Correct numeral using 1, X, L, V.

(a) XILV (b) XLVI (c) XVIL (d) VXIL

15. Greatest 5-digits numbers by using digits 1, 0, 3 is :

(a) 11103 (b) 10333 (c) 33310 (d) 10003

16. Smallest 4 digits numbers using digits 9, 8, 0

(a) 9800 (b) 9008 (c) 8090 (d) 8009

17. Round off 758 to the nearest tens is :

(a) 750 (b) 760 (c) 800 (d) 700

18. Round off 8978 to the nearest hundreds is :

(a) 8980 (b) 9000 (c) 8970 (d) 8900

19. Round off 69684 to the nearest thousands is :

(a) 69000 (b) 69700 (c) 79000 (d) 70000

20. If a number has to round off to the nearest ten thousands then which place of the digit will be taken ?

(a) Tens (b) Hundreds (c) Thousands

(d) Ten Thousands

21. Place value of 0 in 50358 is :

(a) 10000 (b) 100 (c) 1000 (d) 0

22. Which symbols are not repeated in Roman system ?

(a) L, X (b) L, V (c) X, I (d) L, I

23. How many digits are there in one lakh ?

(a) 5 (b) 6 (c) 4 (d) 7

24. How many thousands are there in one lakh ?

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

25. How many maximum number of beads can be inserted in abacus ?

(a) 1 (b) 10 (c) 0 (d) 9

Learning Outcomes

To be able to do —

- Reading, writing and understanding of numbers upto 1,00,000.
- Understanding the concepts of the numbers used in daily activities like buying/selling, exchange of goods.
- Rounding off, place values and face values of numbers.
- Successor-predecessor, ascending descending order of numbers.
- Formation of smallest and greatest numbers using different digits.
- To prepare for competitive examinations.

Answers

Exercise 1.1

1. (a) 46305, Forty six thousand three hundred five.

(b) 70533, Seventy thousand five hundred thirty three.

(c) 84349, Eighty four thousand three hundred fourty Nine.

(d) 33007, Thirty three thousand seven.

2.

	Ten thousands	Thousands	Hundreds	Tens	Ones
(a)		3	8	6	8
(b)		7	6	0	5
(c)	4	1	1	2	3
(d)	9	2	8	5	6
(e)	2	0	2	0	3
(f)	9	9	7	2	8

3. (a) Two thousand four hundred sixty two.

(b) Eight thousand nine hundred eighty eight.

(c) Nineteen thousand fifty.

(d) Thirty three thousand six.

(e) Twenty thousand one hundred ninety eight.

(f) Fifty nine thousand forty five.

(g) Sixty eight thousand three hundred ninety.

4. (a) 1745 (b) 33875 (c) 77077 (d) 50505

(e) 90806 (f) 80880 (g) 10000

5. (a) 999 (b) 10001 (c) 2019 (d) 100000

(e) 48616 (f) 40010

6. (a) 24854 (b) 99998 (c) 39998 (d) 79889

(e) 49999 (f) 23455

Exercise 1.2

1. (a) 20 (b) 4000 (c) 8 (d) 90000

(e) 700 (f) 7000 (g) 60000 (h) 2000

2. (a) 2 (b) 4 (c) 8 (d) 9

(e) 7 (f) 7 (g) 6 (h) 5

3. (a) $200 + 30 + 2$ (b) $4000 + 100 + 80$

(c) $20000 + 7000 + 800 + 10 + 1$ (d) $80000 + 2000 + 900 + 90 + 4$

(e) $10000 + 70 + 3$ (f) $40000 + 3000 + 700 + 10$

(g) $60000 + 1000 + 600 + 30 + 9$ (h) $20000 + 6000 + 900 + 90 + 9$

Exercise 1.3

1. (a) > (b) > (c) < (d) >

(e) = (f) < (g) > (h) <

2. (a) 8728 (b) 66660 (c) 86311 (d) 74437

(e) 40426

3. (a) 7372 (b) 10018 (c) 23443 (d) 927

(e) 13481

4. (a) 699, 1000, 6309, 9036, 9610

(b) 37492, 49273, 52364, 61047, 94713

(c) 36829, 45261, 61514, 63819, 63918

(d) 27052, 36118, 36343, 52073, 70225

(e) 28136, 28236, 28435, 28534, 28853

5. (a) 8084, 7084, 6785, 5074, 4048

(b) 71262, 62271, 61272, 51721, 41112

(c) 87220, 82720, 82270, 72280, 28780

(d) 99093, 99063, 96039, 94835, 93083

(e) 86203, 83226, 28603, 28306, 27504

6. 87641, 14678 **7.** 98530, 30589

8. 98765, 10234

Exercise 1.4

1. (a) 270 (b) 810 (c) 6470 (d) 9780

(e) 910 (f) 100 (g) 25340 (h) 1760

2. (a) 300 (b) 900 (c) 1000 (d) 4600

(e) 600 (f) 63500 (g) 86000 (h) 75100

3. (a) 8000 (b) 9000 (c) 46000 (d) 6000

(e) 64000 (f) 50000 (g) 60000 (h) 10000

4. (a) 30000 (b) 80000 (c) 50000 (d) 10000

(e) 100000 (f) 100000 (g) 20000 (h) 20000

5. (a) 1630, 1600, 2000 (b) 1980, 2000, 2000

(c) 25200, 25200, 25000 (d) 21220, 21200, 21000

(e) 35460, 34500, 35000 (f) 39130, 39100, 39000

(g) 65920, 65900, 66000 (h) 99200, 99200, 99000

6. 4500, 5499

7. 335, 336, 337, 338, 339, 340, 341, 342, 343, 344

Multiple Choice Questions (MCQ)

1. c	**2.** b	**3.** d	**4.** d	**5.** c	**6.** d
7. c	**8.** c	**9.** d	**10.** c	**11.** d	**12.** a
13. c	**14.** b	**15.** c	**16.** d	**17.** b	**18.** b
19. d	**20.** c	**21.** d	**22.** b	**23.** b	**24.** b
25. d					

Chapter-2

Fundamental Operations on Numbers

Objectives :
1. To add, subtract, multiply and divide numbers upto 100000.
2. To provide information regarding exchange of goods, division, banking, buying-selling etc. through operation on numbers of six digits.
3. To give different/alternate solution to all four fundamental operations of numbers.
4. To enhance the thinking level and ability to solve problems of the students.
5. To develop mental and intellectual level of students.

Recap

1. Solve :

(a)
$$\begin{array}{r} 4203 \\ +\,6415 \\ +\quad 131 \\ \hline \\ \hline \end{array}$$

(b)
$$\begin{array}{r} 3708 \\ +\,6272 \\ +\quad 472 \\ \hline \\ \hline \end{array}$$

(c)
$$\begin{array}{r} 5026 \\ -\,2553 \\ \hline \\ \hline \end{array}$$

(d)
$$\begin{array}{r} 7863 \\ -\,5507 \\ \hline \\ \hline \end{array}$$

2. Fill in the blanks :

(a) 115 + 327 = 327 + ☐

(b) 321 + 0 = ☐

(c) 139 × 1 = ☐

(d) 625 × 0 = ☐

(e) 339 – 0 = ☐

(f) 119 ÷ 119 = ☐

(g) 128 ÷ 16 = ☐

(h) 720 + 500 = ☐

(i) 10000 ÷ 10 = ☐

(j) 152 ÷ 19 = ☐

3. Let's Do :

(a) In a school, there are 342 boys and 369 girls. How many total students are there in the school ?

(b) In a godown, there are 459 bags of wheat and 813 bags of rice. How many bags are there in total ?

(c) In a year, Harmanpreet Kaur scored 1790 runs and Mitali Raj scored 1299 runs. How many more runs were scored by Harmanpreet Kaur than Mitali Raj ?

(d) Harpreet took ₹ 10,000 from his father and bought a bicyle for ₹ 3540. How much amount is left with him ?

(e) A shopkeeper has 625 packets of toffees. In each packet, there are 100 toffees. How many toffees in total the shopkeeper has ?

(f) There is 250 litre diesel in diesel tank of a truck. It covers 9 km distance with one litre of diesel. How much distance can be covered with the diesel ?

(g) In a school, there are 648 students. 18 students can sit in a school van to go for a picnic. How many vans are required to take all the students to picnic ?

(h) In a garden, there are 2568 guava trees. If there are 12 trees in a row then how many rows are there for 2568 guava trees.

2.1 Addition and Subtraction

We have learnt addition and subtraction of four digit numbers in previous class. In this class, we shall learn addition/subtraction of larger numbers.

Activity

Teacher will do activity on addition and subtraction of numbers by using currency notes.

Teacher will call two students (Prabhjot and Simarjeet) and give them some currency notes and asked them the total amount they have.

For example : Prabhjot has ₹ 4132 and simarjeet has ₹ 1252 then the total amount will be calculated by adding.

Prabhjot has	4	1	3	2
Simarjeet has	+ 1	2	5	2
Total amount	5	3	8	4

Teacher will continue this activity. Now teacher will ask Simarjeet to take back his currency notes (₹ 1252) from the total amount ₹ 5384. Balance amount will be given to Prabhjot.

Total amount	5	3	8	4
Simarjeet has taken back	– 1	2	5	2
Amount given to Prabhjot	4	1	3	2

In this way, this activity will be performed in different groups and the students will learn about addition/subtraction and also the verification of their answers.

- $91 + 0 = 91$, $0 + 91, = 91$, If 0 is added to any number or any number is added to 0 then result will be that number.
- $79 - 0 = 79$, If 0 is subtracted from any number then result will be same number.

In 4th class, we have learnt the addition and subtraction of numbers with/ without carry up to 10,000. In this class we shall learn these operations on numbers upto 100000.

2.1.1 Addition without carry and Subtraction without borrow :

In this section, we shall learn simple sums of addition without carrying and subtraction without borrowing.

Example 1 : Add : 2213 + 4512

Solution :

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

Example 2 : Subtract : 4567 – 1234

Solution :

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

2.1.2 Addition with carry and Subtraction with borrow:

In this section, we shall learn sums of addition with carry forward and subtraction with borrowing from next digit.

Example 3 : Add : 3756 + 1464

Solution :

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

Example 4 : Subtract : 5688 – 2189

Solution :

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

Verification of Subtraction : Now we shall verify whether the subtraction is right or not with the help of an example

Example 4 :

VERIFICATION :

Larger Number	5 6 8 8	Difference	3 4 9 9
Smaller Number	– 2 1 8 9	Smaller Number	+ 2 1 8 9
Difference	3 4 9 9	Larger Number	5 6 8 8

Example 5 : Add the numbers 3872, 4283 and 8075

Solution :

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

Example 6 : Solve 6543 + 5039 + 832

Solution :

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

Example 7 : Subtract 5908 from 7921

Solution :

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

Exercise-2.1

1. Solve the following:

(a) 6574 + 5502 (b) 5350 + 4102

(c) 56754 + 25740 (d) 25000 + 11887

(e) 8988 – 2450 (f) 8990 – 1034

(g) 80029 – 21200 (h) 56789 – 1234

2. Solve the following :

(a) 8760 + 2584 (b) 9649 + 5161

(c) 38009 + 55691 (d) 25347 + 74040

(e) 8761 + 5584 + 4320 (f) 4687 + 1000 + 1130

(g) 28740 + 54938 + 12338 (h) 72624 + 3106 + 10234

(i) 8849 – 4118 (j) 51307 – 42158

(k) 80003 – 19219 (l) 70000 – 12345

3. Subtract and verify the following :

(a) 98920 – 12334 (b) 40013 – 18167

(c) 78901 – 52214 (d) 40467 – 10239

(e) 79571 – 48678

2.2 Some more concepts on : (Addition & Subtraction)

In last section, we have learnt simple sums of addition and subtraction. In this section, we shall discuss some more problems.

Example 1 : Find the digit in place of *

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

Solution :

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

Example 2 : Find the digit to fill in *

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

Solution :

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

Example 3 : Find value of : 8786 + 1254 – 5232

Solution :

Step 1

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

Step 2

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

Example 4 : Find value of 8975 – 2080 + 4156

Solution :

Step 1

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

Step 2

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

Note: Teachers must teach the above example 3, 4 by changing their orders also.

Exercise-2.2

1. Fill the digit in place of *

(a)
$$\begin{array}{r} 6\ 5\ 6\ 9 \\ +\ *\ *\ 3\ * \\ \hline 9\ 9\ *\ 8 \end{array}$$

(b)
$$\begin{array}{r} 1\ 5\ 6\ *\ 8 \\ +\ *\ *\ 1\ 1\ 2 \\ +\ 0\ 2\ 5\ 5\ 6 \\ \hline 8\ 8\ 3\ 0\ * \end{array}$$

(c)
$$\begin{array}{r} *\ *\ 7\ 8 \\ -\ 2\ 3\ 4\ * \\ \hline 7\ 6\ *\ 5 \end{array}$$

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

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

(f)
$$\begin{array}{r} 2\ 0\ *\ 0\ 4 \\ +\ 6\ *\ 3\ 7\ 3 \\ +\ *\ 5\ 7\ *\ 4 \\ \hline 9\ 9\ 8\ 2\ * \end{array}$$

(g)
$$\begin{array}{r} 9\ 9\ 9\ * \\ -\ *\ *\ 7\ 2 \\ \hline 5\ 4\ *\ 3 \end{array}$$

(h)
$$\begin{array}{r} 9\ 7\ 8\ *\ 3 \\ -\ *\ 5\ 1\ 3\ * \\ \hline 6\ 2\ *\ 5\ 5 \end{array}$$

2. Evaluate the following :

(a) $1238 - 1025 + 5018$ (b) $9386 - 2535 - 1002$

(c) $6307 - 4052 + 2115$ (d) $8107 + 2437 - 6089$

(e) $18837 + 30947 - 33413$ (f) $91206 - 70413 + 30824$

(g) $1003 - 5911 - 3284$ (h) $92319 - 65424 - 12105$

2.3 Word Problems of Addition & Subtraction

We have learnt the numeral problems of addition and subtraction. Now we shall discuss word problems like population increase/decrease, cost/prices, etc. In word problems, first read the statements carefully, solve and find the answer.

Example 1 : Add : 45167, 30662 and 21197

Solution :

$$\begin{array}{r} 45167 \\ +\ 30662 \\ +\ 21197 \\ \hline 97026 \end{array}$$

Example 2 : What is the difference between 82613 and 56607

Solution :

$$\begin{array}{r} 82613 \\ -\ 56607 \\ \hline 26006 \end{array}$$

So difference between 82613 and 56607 is 26006

Example 3 : There are 23456 men 23148 women and 10177 children in a village. Find the total population of the village.

Solution :

Number of men	23456
Number of women	23148
Number of children	+ 10177
Total population	56781

Total population of the village is 56781

Example 4 : Find the number which is :

(a) 21835 more than 74907.

(b) 14076 less than 25431

Solution : (a) To find the required number 74907 and 21835 are to be added

$$\begin{array}{r} 74907 \\ +\ 21835 \\ \hline 96742 \end{array}$$

So the required number is 96742

(b) To find the required number, 14076 is to be subtracted from 25431.

$$\begin{array}{r} 25431 \\ -\ 14076 \\ \hline 11355 \\ \hline \end{array}$$

So the required number is 11355.

Example 5 : What number must be added to 38108 so that the sum becomes 69990 ?

Solution : To find the required number, given number 38108 is to be subtracted from 69990.

$$\begin{array}{r} 69990 \\ -\ 38108 \\ \hline 31882 \\ \hline \end{array}$$

Verification :

Let us verify this :

small number	38108
difference	+31882
large number	69990

Example 6 : Karamjeet bought a TV costing ₹ 24766, an almirah costing ₹ 9179 and a table ₹ 13250 from a market. How much amount did he spend in total ?

Solution :

Price of TV	=	₹ 24766
Price of almirah	=	₹ 9179
Price of table	=	₹ 13250
Total amount	=	₹ 24766
		+ 9179
		+ 13250
		47195

Total amount spent = ₹ 47195

Example 7 : Find the greatest and smallest 5-digit number using digits 5, 1, 8, 6 and 7. Also find the sum and difference of these numbers.

Solution : Greatest 5 digit number = 8 7 6 5 1

Smallest 5 digit number = 1 5 6 7 8

$$\begin{array}{rr} \text{Sum} = & 8\ 7\ 6\ 5\ 1 \\ + & 1\ 5\ 6\ 7\ 8 \\ \hline & 10\ 3\ 3\ 2\ 9 \end{array} \qquad \begin{array}{rr} \text{Difference} = & 8\ 7\ 6\ 5\ 1 \\ - & 1\ 5\ 6\ 7\ 8 \\ \hline & 7\ 1\ 9\ 7\ 3 \end{array}$$

Example 8 : The sum of two numbers is 81900, if one number is 70945 then find the other number.

Solution :

$$\begin{array}{lrr} \text{Sum of two numbers} & = & 81900 \\ \text{One number} & = & 70945 \\ \text{Other number} & = & 81900 \\ & & -70945 \\ & & \hline & & 10955 \end{array}$$

Second number = 10955

Example 9 : Jagtar singh has bought a radio for ₹ 1430. He gives ₹ 2000 to the shopkeeper. How much amount will he get back ?

Solution :

$$\begin{array}{lrr} \text{Amount given to shopkeeper} & = & ₹\ 2000 \\ \text{Price of the radio} & = & ₹\ 1430 \\ \text{Amount get back from shopkeeper} & = & 2000 \\ & & -1430 \\ & & \hline & & ₹\ 570 \end{array}$$

Exercise-2.3

Think and Do :

1. (a) Find the sum of 60498, 31292 and 7132.
   (b) Find difference of 70123 and 40268.
2. 27020 bricks are required for constructing a kitchen and 31275 bricks are required for constructing a room. How many bricks in total are required for construction of both.

3. Surjeet had ₹ 20,000 with him. He bought clothes costing ₹ 13750. How much amount was left with him ?
4. In a library, there are 30155 Punjabi books, 28653 Maths books and 12376 English books. How many books are there in the library ?
5. The sum of two numbers is 89000. If one number is 25450 then find the other number.
6. What number must be added to 70429 to get 100000 ?
7. Find the number which is :
   (a) 7976 more than 36798
   (b) 12967 less than 30067
8. If the price of a computer is ₹ 15560 and price of a laptop is ₹ 9050 more than price of the computer then Find :
   (a) Price of the laptop
   (b) Total price of both the items.
9. Find the greatest and smallest 5 digit numbers using digits 9, 3, 4, 0, 7. Also find their difference.
10. Find the sum of greatest 2 digits, 3 digits and 4 digits numbers.
11. Find the difference of place values of 6 and 7 in number 96074.
12. Subtract 45555 from 6 digit smallest number.
13. Satnam had ₹ 8765 with him. His uncle gave him ₹ 2500. Satnam gave ₹ 4770 to his sister out of his total money. How much money was left with him ?
14. Mandeep had ₹ 10000. He bought a pair of shoes for ₹ 1050 and a suit for ₹ 3600. How much money was left with him ?
15. Sandeep has ₹ 78500 in his bank account. How much more amount should he deposit in the account so that he has ₹ 100000 in his account ?
16. A person travels 135 km by car from Pathankot to Srinagar. Next day, he drives 138 km from Srinagar to Leh. How much distance did he cover ?

2.4 Multiplication

In last section, we have learnt two fundamental operations : addition and subtraction in detail. Now we will learn third fundamental operation i.e 'Multiplication.'

Activity

Teacher will keep various currency notes on the table and ask the 5 students to pick the notes of equal denomination. Each student will pick equal amount of notes :

1st student	=	1000
2nd student	=	1000
3rd student	=	1000
4th student	=	1000
5th student	=	1000

Now ask the students to add the amount

1000 + 1000 + 1000 + 1000 + 1000 = 5000

Teacher will tell the students that if all notes are of equal denomination then we have alternative method for addition i.e 1000 × 5 = 5000.

Activity

Teacher will tell the students that if all 25 students of a class pick ₹ 1000 each, then we have to add 1000, 25 times. It will take more time. We can find its answer by multiplying 1000 × 25.

1000 × 25

$$\begin{array}{r} 1\,0\,0\,0 \\ \times\ 2\,5 \\ \hline 5\,0\,0\,0 \\ 2\,0\,0\,0\,0 \\ \hline 2\,5\,0\,0\,0 \end{array}$$

Example 1 : Multiply the following :

(a) 7345 × 6 (b) 2308 × 35 (c) 1512 × 105

Solution :

(a)

Th	H	T	O
	2	2	3
	7	3	4	5
			×	6
4	4	0	7	0

(b)

Th	H	T	O
	2	3	0	8
		×	3	5
1	1	5	4	0
6	9	2	4	0
8	0	7	8	0

(c)

Th	H	T	O
	1	5	1	2
	×	1	0	5
	7	5	6	0
0	0	0	0	0
1	5	1	2	0	0
1	5	8	7	6	0

Example 2 : Find the digit in place of *

Th	H	T	O
	3	2	*
	×	*	2
	6	*	4
*	3	0	8	0
1	3	*	3	*

Solution :

Th	H	T	O
	3	2	7
	×	4	2
	6	5	4
1	3	0	8	0
1	3	7	3	4

* While multipliying with two or three digit number, teacher will use 0 in place of '×' in tens/hundreds digits place.

Exercise-2.4

1. Solve the following :

(a) 450 × 6 (b) 963 × 9 (c) 529 × 23 (d) 988 × 38

(e) 912 × 56 (f) 806 × 56 (g) 252 × 54 (h) 1888 × 19

(i) 2005 × 34 (j) 1560 × 64 (k) 10569 × 8 (l) 10210 × 9

(m) 230 × 150 (n) 400 × 225

2. Find the product of the following :

(a) 4045 × 23 (b) 1609 × 30 (c) 363 × 134 (d) 455 × 208

(e) 105 × 120 (f) 1440 × 25 (g) 1530 × 61 (h) 3817 × 12

(i) 1908 × 35 (j) 1000 × 29

3. Fill the digits in place of *

$$\begin{array}{r} *\ 3\ 5 \\ \times\ *\ 5 \\ \hline 6\ 7\ 5 \\ *\ 1\ 0\ 0 \\ \hline 8\ 7\ 7\ * \end{array}$$

2.5 Multiplication of a number with 0, 1, 10, 100, ... :

Here you will learn the special case of multiplication when you multiply any number with 0,1, 10,100, ... etc.

In this case, how to write answer directly ?

- Multiply with 0, 1, 10, 100, 1000, 10000 to any number

$6 \times 0 = 0$

$6 \times 1 = 6$

$6 \times 10 = 60$

$6 \times 100 = 600$

$6 \times 1000 = 6000$

$6 \times 10000 = 60000$

- If we multiply first number with second number or second number with the first number the answer will be the same.

For example : $10 \times 6 = 6 \times 10$

$10 \times 6 = 60$

$6 \times 10 = 60$

* $8 \times 0 = 0$, $0 \times 8 = 0$ If any number is multiplied with 0 or 0 is multiplied with any number, then answer will be 0.

* $9 \times 1 = 9$, $1 \times 9 = 9$ If any number is multiplied with 1 or 1 is multiplied with any number, then answer is the number itself.

Exercise-2.5

1. Fill in the blanks :

(a) $451 \times 1 = \square$ (b) $8135 \times 10 = \square$

(c) $650 \times 100 = \square$ (d) $3090 \times 0 = \square$

(e) $129 \times \square = 12900$ (f) $\square \times 1000 = 13000$

(g) $\square \times 791 = 0$ (h) $\square \times 82 = 82 \times 602$

(i) $8414 \times 10 = \square$ (j) $67 \times 100 = \square$

(k) $91 \times 1000 = \square$ (l) $100 \times 1000 = \square$

(m) $545 \times \square = 5450$ (n) $\square \times 10 = 7060$

(o) $798 \times \square = 798$

2.6 Word Problems of Multiplication

In last section, we have learnt the numerical sums of multiplication. In this section, we shall understand word problems through multiplication.

Example 1 : The price of a cycle is ₹ 2560.What is the total price of 39 cycles ?

Solution : The price of one cycle = ₹ 2560

The price of 39 cycles = ₹ 2560 × 39

$$\begin{array}{r} 2560 \\ \times\ 39 \\ \hline 23040 \\ 76800 \\ \hline 99840 \end{array}$$

The price of 39 cycles = ₹ 99840

Example 2 : Suppose your father earns ₹ 6500 in a month. How much money will he earn in a year ?

Solution : Father earns in one month = ₹ 6500

Father earns in 12 month = ₹ 6500 × 12

(1 year = 12 month)

$$\begin{array}{r} 6500 \\ \times\ 12 \\ \hline 13000 \\ 65000 \\ \hline 78000 \end{array}$$

Father earns ₹ 78000 in one year

Example 3 : A person earns ₹ 1308 daily. How much money will he earn in the month of November ?

Solution : A person earns in a day = ₹ 1308

A person earns in 30 days = ₹ 1308 × 30

(Because Number of days in November = 30)

$$\begin{array}{r} 1\ 3\ 0\ 8 \\ \times\ 3\ 0 \\ \hline 0\ 0\ 0\ 0 \\ 3\ 9\ 2\ 4\ 0 \\ \hline 3\ 9\ 2\ 4\ 0 \end{array}$$

Therefore a person earns ₹ 39240 in month November.

Exercise-2.6

1. The price of a cycle is ₹ 5699. What is price of 17 cycles ?
2. There are 12 tiles in a box. How many tiles are there in 4590 boxes ?
3. Multiply 4 digit smallest number with 98.
4. Rate list of electrical equipment in electrical shop is as follows :

Rate List		
Equipment		**Price (Per item)**
	Washing Machine	₹ 24999
	L.C.D	₹ 42500
	AC	₹ 54000
	Water Gyser	₹ 12999
	Refrigerator	₹ 18499

(i) Charan has ₹ 1 lakh with him. He buys 2 washing machines and one L.C.D. How much amount has he spent ?

(ii) Charan's brother has ₹ 1 lakh. He buys one AC, Two water Gysers and one Refrigerator. How much amount is left with him ?

5. A factory manufactures 4990 toffees a day. How many toffees will be manufactured in 19 days?

6. 6798 bricks are loaded in a tractor in an hour. How many bricks will be loaded in 13 hours ?

7. A shopkeeper sells one mobile phone for ₹ 5089. If he sells 18 such mobile phones in a day, how much amount would he collect in a day ?

8. Multiply 3 digit largest number with 95.

9. How many seconds are there in 24 hours ?

2.7 Division

Upto now, we have learnt three fundamental operations of numbers : addition subtraction and multiplication. Now we will learn fourth fundamental operation i.e., Division.

We have learnt different methods of division of four digit number with two digit number . Division with the help of number line, continuous subtraction, simple division was taught by the teacher. In this chapter, we shall learn division of numbers upto 100000 by using different divisors.

2.7.1 Informal Method of Division :

Teacher will call 15 students and ask them to divide the currency notes of amount ₹ 8415 in equal parts amongst themselves.

Teacher - How will you divide ₹ 8415 in 15 parts ?

Student - Sir, first I will give ₹ 500 note to each student.

Teacher - How much amount is left now ?

Student - Sir, ₹ 915 left.

Teacher - How will you divide ₹ 915 ?

Student - Now I will give ₹ 50 note to each student.

Teacher - How much amount is left now ?

Student - ₹ 165

```
  8 4 1 5
- 7 5 0 0
---------
    9 1 5
-   7 5 0
---------
    1 6 5
-   1 5 0
---------
      1 5
-     1 5
---------
        0
```


Teacher - How will you divide ₹165 ?

Student - I will give ₹ 10 to each.

Teacher - How much amount is left now ?

Student - Sir, ₹ 15 left . Now 1 will give ₹ 1 to each student.

Teacher - How much money is left ?

Student - Nothing

Teacher - Now how much amount has every one got ?

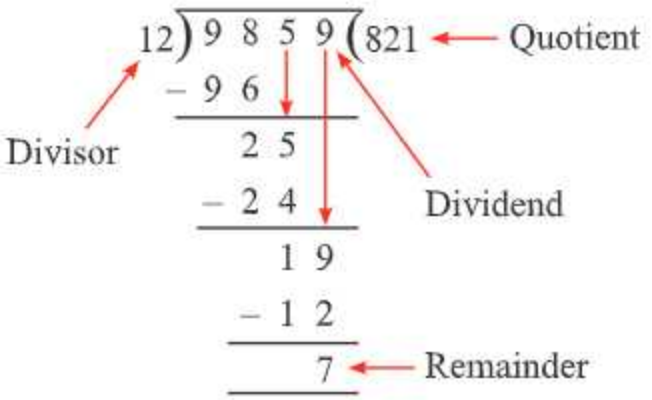
Student - 500 + 50 + 10 + 1 = 561 (By Adding)

In this process, there is continuous division of tens (with ₹ 50 – 50 and ₹ 10 – 10) which is not a formal method of division. So we will learn formal method of division .

2.7.2 Formal Method of Division :

Example 1 : 9859 ÷ 12

Solution :



Teacher will tell students that while dividing any number with 2 digit number, first read table of divisor (2 digit number) upto first two digits of dividend as in case of above division, 9859 is divided by 12, So read table of 12 upto first two digits (98) of the dividend.

98 ÷ 12

Table of 12 : 12 × 8 = 96 ; 98 – 96 = 2 (Remainder)

- Now along 2, lower down and write next digit (5) of dividend, we've 25

25 ÷ 12

Table of 12 : 12 × 2 = 24 ; 25 –24 = 1 (Remainder)

Now along 1 ,again lower down and write next digit (9) of dividend, we've 19

19 ÷ 12

Table of 12 : 12 × 1 = 12 ; 19 – 12 = 7 (Remainder)

Ans : Quotient = 821, Remainder 7

Verification : We can verify the above division in the following way :

Dividend = Quotient × Divisor + Remainder

9859 = 821 × 12 + 7

	8 2 1	Quotient
	× 1 2	Divisor
	1 6 4 2	
+	8 2 1 0	
	9 8 5 2	
+	7	Remainder
	9 8 5 9	Dividend

Example 2 : Divide 12525 by 25 and verify.

Solution :

$$25\overline{)12525}\,(0501$$

$$\begin{array}{r} -00 \\ \hline 125 \\ -125 \\ \hline 02 \\ -00 \\ \hline 025 \\ -025 \\ \hline 00 \\ \hline \end{array}$$

Verification :

Dividend = Quotient × Divisor + Remainder

12525 = 501 × 25 + 0

12525 = 12525 + 0

12525 = 12525

* 0 ÷ 7 = 0 ; 0 is divided by any number (except 0) then answer will be 0.
* Division by 0 (zero) is not possible.

Exercise-2.7

1. Solve the following :

(a) $117 \div 13$ (b) $135 \div 15$ (c) $72 \div 12$ (d) $108 \div 9$
(e) $78 \div 13$ (f) $121 \div 11$ (g) $140 \div 20$ (h) $144 \div 16$
(i) $119 \div 17$

2. Divide the following and verify :

(a) $54598 \div 12$ (b) $8975 \div 21$ (c) $77552 \div 18$ (d) $88001 \div 17$
(e) $12896 \div 11$

3. Solve the following and verify :

(a) $760 \div 12$ (b) $550 \div 14$ (c) $894 \div 21$
(d) $913 \div 19$ (e) $826 \div 25$ (f) $7645 \div 24$
(g) $89781 \div 9$ (h) $99999 \div 80$ (i) $82525 \div 75$
(j) $70008 \div 14$ (k) $50205 \div 15$ (l) $16258 \div 36$
(m) $96000 \div 50$ (n) $45457 \div 35$

2.8 Word Problems related to Division :

In the last section, we have learnt the numerical problems of division. In this section, we shall learn division through general problems such as distribution of articles, amount etc.

Example 1 : A shopkeeper has 36540 toys. He sells 15 toys daily. How many days does he need to sell all his toys ?

Solution : Total Toys = 36540

Daily sold toys = 15

Number of days to sell out the toys

$= 36540 \div 15$

```
15) 3 6 5 4 0 (2436
  - 3 0
  -----
      6 5
    - 6 0
    -----
        5 4
      - 4 5
      -----
          9 0
        - 9 0
        -----
          0 0
```

Ans : 2436 days

Example 2 : An employee earns ₹ 65596 in the month of January. How much is he earning in a day ?

Solution : An employee earns in January earning ₹ 65596

Total days in January = 31

Earning in a day = 65596 ÷ 31

```
31)65596(2116
  -62
   35
  -31
    49
   -31
     186
    -186
      000
```

Ans : ₹ 2116

Example 3 : By what 160 must be multiple so that product becomes 24480 ?

Solution : Product of two numbers = 24480

One number = 160

Second number = 24480 ÷ 160

```
160)24480(153
  -160
   848
  -800
    480
   -480
      0
```

Therefore required number is 153

Exercise-2.8

1. In a stadium, in the match of cricket there are 84000 people sitting in 24 rows. How many people are sitting in a row ?
2. You have ₹ 99825 which is to be distributed equally among 33 friends. How much amount will each friend get ?
3. My grandfather divided ₹ 72000 equally among four brothers-sisters. How much will each get ?
4. What number must be multiplied with 26 to get 14508 ?
5. The gardener has 23976 flowers to make garlands. One garland has 24 flowers in it. How many garlands can be made from 23976 flowers ?

6. How many ₹ 2000 notes are there in forty thousand rupees ?

7. I need change of ₹ 25000. How many following notes shall I get ?

   (a) Number of notes of ₹1000 = ...

   (b) Number of notes of ₹ 500 = ...

   (c) Number of notes of ₹ 100 = ...

8. A JCB machine picks 900 bricks in a round. How many rounds will it take to pick 99000 bricks ?

9. The cost of a railway ticket is ₹ 78. Palak gave ₹ 7722 for buying tickets. How many tickets will she get ?

10. A factory, manufactures 45540 icecream cones in the month of June. How many icecream cones are manufactured in a day ?

2.9 Estimating in Operations on numbers :

In many situations of day-to-day life, we estimate price, measurement and distance. For example, height of a tree, distance between two cities, weight of person/article etc. Let us consider some examples to see estimation related to everyday life.

Example 1 : Find the estimate and actual sum of 9748 and 5476.

Solution : Rounding off 9748 to the nearest 1000 = 10000

Rounding off 5476 to the nearest 1000 = 5000

	1	0	0	0	0			9	7	4	8
+		5	0	0	0		+	5	4	7	6
Estimated sum	1	5	0	0	0	Actual		1	5	2	2	4

Example 2 : Find the estimate and actual difference between 875 and 438.

Solution : Rounding off 875 to the nearest 100 = 900

Rounding off 438 to t he nearest 100 = 400

		9	0	0			8	7	5
–		4	0	0		–	4	3	8
Estimated difference		5	0	0	Actual		4	3	7

Example 3 : Find the estimated product of 412 and 72.

Solution : Rounding off 412 to the nearest 100 = 400

Rounding off 72 to the nearest 10 = 70

Estimated product

$400 \times 70 = 28000$

Example 4 : Find the estimated quotients of $548 \div 53$.

Solution : Rounding off 548 to the nearest 100 = 500

Rounding off 53 to the nearest 10 = 50

So $500 \div 50 = 10$

Estimated quotient = 10

* Estimating of the numbers must be according to the number of digits in the number such as Rounding off 4 digit number to the nearest 1000, Rounding off 3-digit number to the nearest 100, Rounding off two digits to the nearest 10. With this, we get the accurate answer.

Exercise-2.9

1. Find the estimated answers :

(a) $753 + 525$ (b) $11526 + 8748$

(c) $980 - 489$ (d) $5897 - 2987$

(e) 440×28 (f) 6198×13

(g) $563 \div 34$ (h) $7541 \div 43$

2.10 BODMAS

B	O	D	M	A	S
( )		÷	×	+	–
Bracket	of	Division	Multiplication	Addition	Subtraction

When we operate all four operations in one sum then we solve them in a fixed pattern which is called BODMAS. If we do not solve the sums according to this rule then we will get wrong answer. In this chapter, we will consider only DMAS.

$4 \times 4 + 4 - 4 \div 4$

Step 1 : In this sum, first we will divide according to rule :

$4 \times 4 + 4 - 1$

Step 2 : Now we will multiply :

$16 + 4 - 1$

Step 3 : Now do addition of 16 and 4.

$20 - 1$

Step 4 : Now subtract 1 from 20 :

19

So our required answer is 19.

Example 1 : Solve : $9 + 7 \times 3$

Solution : $9 + 7 \times 3$

$= 9 + 21 = 30$

Example 2 : Solve : $10 + 12 \div 2 - 3$

Solution : $10 + 12 \div 2 - 3$

$= 10 + 6 - 3 = 16 - 3 = 13$

Example 3 : Solve : $30 \div 6 + 5 \times 4 - 8$

Solution : $5 + 5 \times 4 - 8$

$5 + 20 - 8 = 25 - 8 = 17$

Example 4 : Solve $60 + 9 \times 5 - 18 \div 6$

Solution : $60 + 9 \times 5 - 3$

$60 + 45 - 3$

$105 - 3 = 102$

Exercise-2.10

1. Solve the following :

1. $42 \div 7 + 8$
2. $8 + 6 \times 2$
3. $7 \times 8 \div 4 - 6$
4. $63 \div 9 \times 4 + 28 - 15$
5. $25 \times 3 + 42 \div 6 - 4$
6. $18 \div 6 \times 21 + 17 - 18$
7. $8 \div 8 + 8 \times 8 - 8$
8. $72 + 48 \times 36 \div 18 - 9$
9. $44 + 2 \times 9 - 35 \div 5$
10. $18 + 126 \div 14 \times 3 - 25$

Multiple Choice Questions (MCQs)

1. 65432 + 34568

   (a) 99999 (b) 100000 (c) 10000 (d) 99998

2. 35406 + 2580 + 43251 = 43251 + ☐ + 35406

   (a) 35406 (b) 43251 (c) 2580 (d) 81237

3. 99999 + 0

   (a) 99990 (b) 99900 (c) 100000 (d) 99999

4. 100000 – 1 = ☐

   (a) 10000 (b) 0 (c) 99999 (d) 100000

5. Simar has ₹ 5832 and his sister Prabhjot has ₹ 3565. How much amount does Simar have more than his sister ?

   (a) 2267 (b) 9397 (c) 22776 (d) 9973

6. Surjeet has ₹ 50,000 in her bank account and her husband Charan Singh has ₹ 35682 in his account. What is total amount in both accounts ?

   (a) 14318 (b) 95682 (c) 85682 (d) 15318

7. The population of a town is 12078. Out of that the number of men is 4872, women is 4729 and the rest are children. How many children are in the town ?

   (a) 2477 (b) 20578 (c) 9601 (d) 8206

8. 98540 – ☐ = 98539

   (a) 0 (b) 1 (c) 98540 (d) 98539

9. 9999 + ☐ = 100000

   (a) 1 (b) 0 (c) 90001 (d) 9001

10. 1000 – ☐ = 999

    (a) 1 (b) 0 (c) 90001 (d) 9001

11. Find the difference between 5-digit smallest number and 4-digit largest number.

(a) 10000 (b) 9999 (c) 1 (d) 0

12. Find the sum of the greatest and smallest 5-digit number using digits 2, 0, 4, 6, 7?

(a) 98687 (b) 96887 (c) 55953 (d) 76420

13. $1500 \times 30 \times 0$

(a) 45000 (b) 30 (c) 0 (d) 450

14. $7500 \times 40 = 40 \times$ ☐

(a) 400 (b) 4000 (c) 750 (d) 7500

15. ☐ $\div 100 = 1000$

(a) 100 (b) 100000 (c) 100000 (d) 10

16. The cost of a book ₹ 79. What is the cost of 12 books ?

(a) 948 (b) 938 (c) 790 (d) 793

17. Geeta has ₹ 175 with her. If she gives ₹ 25 to each child. How many children will get the money ?

(a) 6 (b) 9 (c) 7 (d) 8

18. $700 \times$ ☐ $= 2800 \times 1$

(a) 5 (b) 6 (c) 4 (d) 3

19. $9999 \div 1 =$

(a) 999 (b) 1 (c) 111 (d) 9999

20. $8899 \div 8899 =$

(a) 0 (b) 1 (c) 2 (d) 8899

21. $99 \times 99 =$

(a) 99 (b) 9801 (c) 9901 (d) 1

22. If price of 15 notebooks is ₹ 90. What is the price of one notebook ?

(a) 3 (b) 5 (c) 6 (d) 6

23. The Product of two numbers is 256. If one number is 256 then find the other number.

(a) 1 (b) 2 (c) 0 (d) 256

24. If $894 \times 100 = 89400$ then $894 \times 10 =$

(a) 894 (b) 89400 (c) 8940 (d) 8941

25. $26 \div 2 \times 4 + 4 - 40 =$ ☐

(a) 64 (b) 8 (c) 4 (d) 16

Learning Outcomes

- Concept of Four Fundamental Operations on the numbers upto 100000 i.e., addition, subtraction, multiplication and division.
- Concept of exchange of goods, increase-decrease, banking, buying selling etc through operation on numbers.
- Concept of weight, distance, money etc. using four fundamental operations on numbers through operation on numbers.
- Solving life's problems with multiplication and division of continuous adding and subtracting.
- Multiplication and division of numbers with 3-digit numbers in different ways.
- Prepare for competitive exams.

Answers

Exercise-2.1

5. (a) 12076 (b) 9452 (c) 82494 (d) 36887
(e) 6538 (f) 7956 (g) 58829 (h) 55555

6. (a) 11344 (b) 14810 (c) 93700 (d) 99387
(e) 18665 (f) 6817 (g) 96016 (h) 85964
(i) 4731 (j) 9149 (k) 60787 (l) 57655

7. (a) 86586 (b) 21846 (c) 26687 (d) 30228
(e) 30893

Exercise-2.2

1. (a)
$$\begin{array}{r} 6\,5\,6\,9 \\ +\,3\,3\,3\,9 \\ \hline 9\,9\,0\,8 \\ \hline \end{array}$$

(b)
$$\begin{array}{r} 1\,5\,6\,3\,8 \\ +\,7\,0\,1\,1\,2 \\ +\,0\,2\,5\,5\,6 \\ \hline 8\,8\,3\,0\,6 \\ \hline \end{array}$$

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

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

(e)
$$\begin{array}{r} 5\,3\,8\,0 \\ +\,4\,5\,6\,9 \\ \hline 9\,9\,4\,9 \\ \hline \end{array}$$

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

(g)
$$\begin{array}{r} 9\,9\,9\,5 \\ -\,4\,5\,7\,2 \\ \hline 5\,4\,2\,3 \\ \hline \end{array}$$

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

2. (a) 5231 (b) 5849 (c) 4370 (d) 4455
(e) 14871 (f) 51617 (g) 808 (h) 14790

Exercise-2.3

1. (a) 98922 (b) 29855

2. 58295 bricks **3.** ₹ 6250 **4.** 71184 Books

5. 633550 **6.** 29571 **7.** (a) 44774 (b) 17100

9. 97430, 30479, difference 66951 **10.** 11097

11. 5930 **12.** 54445 **13.** ₹ 6495

14. ₹ 5350 **15.** ₹ 21500 **16.** 303 km

Exercise-2.4

1. (a) 2700 (b) 8667 (c) 12167 (d) 37544
(e) 51072 (f) 45136 (g) 67608 (h) 35872
(i) 68170 (j) 99840 (k) 84552 (l) 91890
(m) 34500 (n) 90000

2. (a) 93035 (b) 48270 (c) 48642 (d) 94640
(e) 12600 (f) 36000 (g) 93330 (h) 45804
(i) 66780 (j) 29000

3.

$$\begin{array}{r} 135 \\ \times\ 65 \\ \hline 675 \\ 8100 \\ \hline 8775 \\ \hline \end{array}$$

Exercise-2.5

1. (a) 451 (b) 81350 (c) 65000 (d) 0
(e) 100 (f) 13 (g) 0 (h) 602
(i) 84140 (j) 6700 (k) 91000 (l) 100000
(m) 10 (n) 706 (o) 1

Exercise-2.6

1. ₹ 96883 **2.** 55080 **3.** 98000
4. (a) ₹ 92498 and (b) ₹ 1503 **5.** 94810 toffees
6. 88374 bricks **7.** ₹ 91602 **8.** 94905
9. 86400 seconds

Exercise-2.7

1. (a) 9 (b) 9 (c) 6 (d) 12
(e) 6 (f) 11 (g) 7 (i) 7
(j) 7

2. (a) Quotient = 4549, Remainder = 10
(b) Quotient = 427, Remainder = 8
(c) Quotient = 4308, Remainder = 8
(d) Quotient = 5176, Remainder = 9
(e) Quotient = 1172, Remainder = 4

3. (a) Quotient = 63, Remainder = 4
(b) Quotient = 39, Remainder = 4
(c) Quotient = 42, Remainder = 12

(d) Quotient = 48, Remainder = 1
(e) Quotient = 33, Remainder = 1
(f) Quotient = 318, Remainder = 13
(g) Quotient = 9975, Remainder = 6
(h) Quotient = 1249, Remainder = 79
(i) Quotient = 1100, Remainder = 25
(j) Quotient = 5000, Remainder = 8
(k) Quotient = 3347, Remainder = 0
(l) Quotient = 451, Remainder = 22
(m) Quotient = 1920, Remainder = 0
(n) Quotient = 1298, Remainder = 27

Exercise-2.8

1. 3500 **2.** ₹ 3025 **3.** ₹ 18000
4. 558 **5.** 999 garland **6.** 20 notes
7. (a) 25 notes (b) 50 notes (c) 250 notes
8. 110 rounds **9.** 99 tickets **10.** 1518 cones

Exercise-2.9

1. (a) 1300 (b) 19000 (c) 500 (d) 3000
(e) 12000 (f) 60000 (g) 20 (h) 200

Exercise-2.10

1. 14 **2.** 20 **3.** 8 **4.** 41
5. 78 **6.** 62 **7.** 57 **8.** 159
9. 55 **10.** 20

Multi-Choice Questions (MCQ)

1. b **2.** c **3.** d **4.** c
5. a **6.** c **7.** a **8.** b
9. c **10.** d **11.** c **12.** b
13. c **14.** d **15.** b **16.** a
17. c **18.** c **19.** d **20.** b
21. b **22.** c **23.** a **24.** c
25. d

CHAPTER - 3

Highest Common Factor (HCF) and Lowest Common Multiple (LCM)

Objectives :
1. To provide information about Multiples and Factors.
2. To give knowledge about the concept of HCF and LCM with the help of different activities.
3. To give knowledge about various methods of finding HCF and LCM.
4. To develop their ability to use HCF and LCM in real life situations.
5. To make them familiar with Even, Odd, Prime and Composite numbers with the help of activities.
6. To prepare them for competitive exams.

Introduction

3.1 Multiples

When two or more than two numbers are multiplied, we get the product. This product is the multiple of each multiplied number. Observe the following:

(1) $4 \times 7 = 28$ (2) $8 \times 6 = 48$

(3) $2 \times 3 \times 4 = 24$ (4) $9 \times 10 = 90$

From the above multiplications, we get the following

(1) 28 is the multiple of 4 and 7.

(2) 48 is the multiple of 6 and 8.

(3) 24 is the multiple of 2, 3 and 4.

(4) 90 is the multiple of 9 and 10.

So , the multiples of a number are obtained by multiplying the given number with natural numbers (1, 2, 3, 4, 5, ...)

Multiples of 3	Multiples of 8
$3 \times 1 = 3$	$8 \times 1 = 8$
$3 \times 2 = 6$	$8 \times 2 = 16$
$3 \times 3 = 9$	$8 \times 3 = 24$
$3 \times 4 = 12$	$8 \times 4 = 32$
$3 \times 5 = 15$	$8 \times 5 = 40$
.. ..	.. ..
.. ..	.. ..
.. ..	.. ..
.. ..	.. ..

So, the above numbers 3, 6, 9, ... and 8, 16, 24, ... are the multiples of 3 and 8 respectively.

Things to Remember

- Every number is a multiple of itself.
- Every number is a multiple of 1.
- Every multiple of a number is greater than or equal to the number.
- The smallest multiple of a number is the number itself.

3.2 Factors :

Activity

In class distribute 6-6 buttons to each student and tell them to place them in the form of every possible horizontal line, vertical line,square or rectangular shape that will lead to the factors of the given number.

Students can make the following possible lines and shapes.

1. Row : 

2. Row 1

Row 2

Row 3

Row 4

Row 5

Row 6

3. Row 1

Row 2

4. Row 1

Row 2

Row 3

5.

6.

In figure 1, buttons are in 1 row.

In figure 2, buttons are in 6 rows.

In figure 3, buttons are in 2 rows.

In figure 4, buttons are in 3 rows.

In figure 5 and 6, buttons are not in the shape of line or square /rectangle. So these do not form factors.

So, factors according to the number of rows from figure 1 to 4 are 1, 6, 2 and 3.

So factors of 6 = 1, 2, 3, 6

Methods of Finding Factors of a number

We can find all the factors of a number in two ways :

(*a*) By Multiplication

$1 \times 6 = 6$

$2 \times 3 = 6$

(*b*) By Division

$6 \div 1 = 6$

$6 \div 2 = 3$

$6 \div 3 = 2$

$6 \div 6 = 1$

So 1, 2, 3, 6 are all factors of 6.

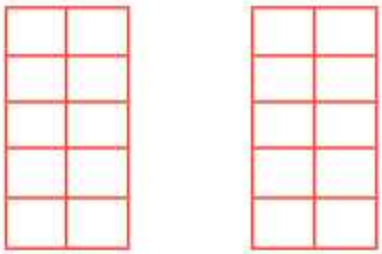
Things to Remember

- 1 is a factor of every number except zero.
- Every non-zero number is a factor of itself.
- The smallest factor of a number is 1.
- The largest factor of a number is the number itself.
- If 1st number is factor of 2nd number then 2nd number is the multiple of 1st number.

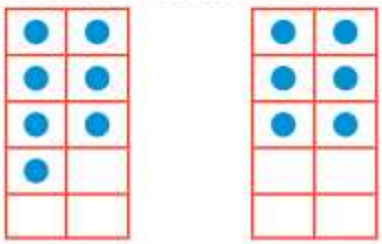
3.3 Even and Odd Numbers :

Activity

Ask the students to draw two tables with 10 boxes.



The teacher will write '7' and 6 on the blackboard and will ask the students whether it is even/odd. Teacher will tell the students to paste/stick seven dots/bindis in one box and 6 dots/bindis in the other box.

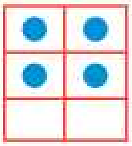


7 6

We observe that in the first three rows, dots/bindis form pairs but in the fourth row, no pair is formed. When the dots/bindis form pairs then the number is an even number i.e., '6' but when the dot/bindi does not form a pair, it is an odd number i.e., '7' as in the above figure.

- Teacher is advised to give some more examples which he finds suitable.

Now, we will take two digits number say 74. To see whether 74 is even or odd we need not to paste 74 dots/bindis. We will put its ones place digit i.e., 4 in the box.

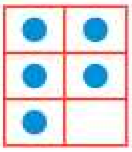


In number 74 ones digit 4 forms two pairs of dots/bindis.

So 74 is an even number.

Now consider 3 digits number 175 :

1 7 [5] Here we see that ones digit is 5.



Digit 5 does not form complete pairs of dots/bindis. So 175 is an odd number.

In this way, we can tell whether the number is even or odd just by looking at unit digit of a number.

- Sum of two even numbers is always even as $2 + 4 = 6$
- Sum of two odd numbers is always even as $1 + 3 = 4$
- Sum of even and odd numbers is always odd as $2 + 3 = 5$

Things to Remember

1. If a digit at ones place is 0, 2, 4, 6, 8 then it is an even number and if a digit at ones place is 1, 3, 5, 7, 9 then it is an odd number.
2. Even number is always divided by 2 and 2 is the factor of every even number.

Example 1 : Is 45 a multiple of 9 ?

Solution : Divide 45 by 9

```
9)4 5(05
 -0
 ----
  4 5
 -4 5
 ----
    0
 ----
```

45 is completely divisible by 9. So 45 is a multiple of 9.

Example 2 : Is 82 a multiple of 8 ?

Solution : Divide 82 by 8

$$\begin{array}{r} 8\overline{)\,8\;\;2\,(10} \\ -\,8 \\ \hline 0\;\;2 \\ -\;\;0 \\ \hline 2 \end{array}$$ Remainder

82 is not completely divisible by 8. So 82 is not a multiple of 8.

Example 3 : Write first four multiples of 9.

Solution : $9 \times 1 = 9$, $9 \times 2 = 18$, $9 \times 3 = 27$, $9 \times 4 = 36$

So, the first four multiples of 9 are 9, 18, 27, 36.

Example 4 : Write factors of 12.

Solution : **By Multiplication :**

$1 \times 12 = 12$

$2 \times 6 = 12$

$3 \times 4 = 12$

$4 \times 3 = 12$

$6 \times 2 = 12$ } Here factors are repeating.

$12 \times 1 = 12$

So, 1, 2, 3, 4, 6 & 12 are the factors of 12

Division Method :

$$\begin{array}{r} 1\overline{)\,1\;\;2\,(12} \\ -\,1 \\ \hline 0\;\;2 \\ -\,2 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 2\overline{)\,1\;\;2\,(06} \\ -\,0 \\ \hline 1\;\;2 \\ -\,1\;\;2 \\ \hline 0\;\;0 \end{array}$$

$$\begin{array}{r} 3\overline{)\,1\;\;2\,(04} \\ -\,0 \\ \hline 1\;\;2 \\ -\,1\;\;2 \\ \hline 0\;\;0 \end{array}$$

$4\overline{)12}(03$ -0 12 -12 00	$5\overline{)12}(02$ -0 12 -10 02 Remainder	$6\overline{)12}(02$ -0 12 -12 00
$7\overline{)12}(01$ -0 12 -7 05 Remainder	$8\overline{)12}(01$ -0 12 -8 04 Remainder	$9\overline{)12}(01$ -0 12 -9 03 Remainder
$10\overline{)12}(01$ -0 12 -10 02 Remainder	$11\overline{)12}(01$ -0 12 -11 01 Remainder	$12\overline{)12}(01$ -0 12 -12 00

Here 12 is divisible by 1, 2, 3, 4, 6 and 12.

So, factors of 12 are 1, 2, 3, 4, 6 and 12.

Example 5 : Is 8 a factor of 72 ?

Solution : Divide 72 by 8.

$$8\overline{)72}(09$$
$$-0$$
$$72$$
$$-72$$
$$0$$

72 is completely divisible by 8. So 8 is factor of 72.

Exercise-3.1

1. Write the first five multiples of the following numbers :

(*a*) 5 (*b*) 9 (*c*) 10 (*d*) 12

(*e*) 16 (*f*) 17

2. Find the Factors of the given numbers :

(*a*) 5	1	2	3	4	5								
(*b*) 8	1	2	3	4	5	6	7	8					
(*c*) 14	1	2	3	4	6	7	8	9	10	11	12	13	14
(*d*) 12	1	2	3	4	5	6	7	8	9	10	11	12	
(*e*) 25	1	2	3	4	5	10	15	20	25	30	35	40	45
(*f*) 36	1	2	3	4	5	6	7	12	18	20	24	30	36

3. Write Factors of the following numbers :

(*a*) 18 (*b*) 24 (*c*) 35 (*d*) 36

(*e*) 45 (*f*) 21

4. Find out the Even Numbers from the following :

(*a*)	12	23	34	16	19	28
(*b*)	35	48	53	69	72	90
(*c*)	450	213	568	664	789	98
(*d*)	235	456	968	604	731	888
(*e*)	63	136	245	446	1278	2341
(*f*)	47	168	999	1729	5864	6859

5. Find out the Odd Numbers from the following :

(*a*)	11	23	54	16	19	35
(*b*)	36	45	58	69	76	97
(*c*)	451	215	508	614	789	983
(*d*)	237	416	948	654	739	666
(*e*)	631	135	249	746	1279	2851
(*f*)	49	178	765	1729	9261	6859

6. Fill in the blanks :

(*a*) If $4 \times 9 = 36$ then factors of 36 are ..... and ..... .

(*b*) If $8 \times 7 = 56$ then factors of 56 are ..... and ..... .

(*c*) If $3 \times 5 \times 6 = 90$ then factors of 90 are ....., ... and ..... .

(*d*) In $8 \times 10 = 80$, the multiple of 8 and 10 is ..... .

(*e*) In $2 \times 3 \times 5 = 30$ then 30, is the multiple of ....., ... and ..... .

7. Write True or False :

(*a*) 24 is a factor of 24.

(*b*) 2 is a factor of every number.

(*c*) 24 is an even number.

(*d*) 136 is an odd number.

(*e*) There are infinite multiples of a number.

(*f*) 36 is a multiple of 5 and 7.

(*g*) Sum of two even numbers is an odd number.

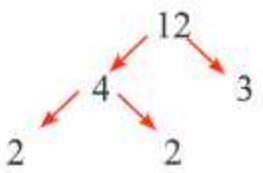
(*h*) Smallest even number is 0.

(*i*) 152 is a odd number.

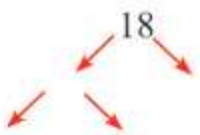
(*j*) There are five single digit even numbers.

8. Observe the Factorisation Pattern and complete:

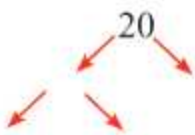
(*a*)



(*b*)



(*c*)



9. Look at the pattern and solve :

(*a*)	2	77	13
(*b*)	3	38	19
(*c*)	5	39	7
(*d*)	11	85	17

10. Understand and complete the following :

(a) 

Odd

(b) 

(c) 

(d) 

(e) 

Even Odd

2, 4, 6, 8 and 0 if these are units of ones

No matter how long is the amount, these are even buns

1, 3, 5, 7 and 9, if these are units of ones

No matter how long is the amount, these are odd runs.

Product Multiple and Factor

When we multiply some number, to know how they conduct Answer of the multiplication is called their product.

Now those number of multiplication are factors of the product.

Product is also the multiple of those number, you can instruct

3.4 Prime and Composite Numbers :

We can tell whether a given number is a prime or a composite number by counting the number of factors. Factors of first 10 natural numbers are as follows :

Factors of 1 = 1

Factors of 2 = 1, 2

Factors of 3 = 1, 3

Factors of 4 = 1, 2, 4

Factors of 5 = 1, 5

Factors of 6 = 1, 2, 3, 6

Factors of 7 = 1, 7

Factors of 8 = 1, 2, 4, 8

Factors of 9 = 1, 3, 9

Factors of 10 = 1, 2, 5, 10

In the above table, numbers 2, 3, 5 and 7 have two factors : 1 and the number itself. These numbers are called Prime Numbers. Numbers 4, 6, 8, 9, 10 have more than two factors, these numbers are called Composite Numbers.

Prime Numbers : The numbers which have exactly two factors are called Prime Numbers. Example 2, 3, 5, 7 - etc.

Composite Numbers : The numbers which have more than two factors are called Composite Numbers. Example 4, 6, 8, 9, 10, etc.

Now the Question arises : Is 1 prime or composite ? The number 1 has only one factor, so it is neither a prime nor composite.

Prime Numbers between 1 and 100.

The steps to find prime numbers between 1 to 100 are given below :

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~~

Step 1 : Write numbers from 1 to 100.

Step 2 : Encircle 2 and cross all the numbers which are multiples of 2.

Step 3 : Encircle 3 and cross all the numbers which are multiples of 3.

Step 4 : Encircle 5 and cross all the numbers which are multiples of 5.

Step 5 : Encircle 7 and cross all the numbers which are multiples of 7.

Step 6 : Encircle 11 and cross all the numbers which are multiples of 11.

Step 7 : Continue this process till all the numbers are either crossed or encircled.

Step 8 : Make a box around number 1, because it is a unique number.

All the encircled numbers are prime numbers and the crossed-out are Composite Numbers. Prime Numbers between 1 and 100 are 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89 and 97.

This is called the sieve of Eratosthenes.

Things to Remember

- 1 is neither a prime nor a composite number.
- Only 2 is an even prime number.
- The smallest prime number is 2.
- The smallest composite number is 4.

3.5 Prime Factorisation :

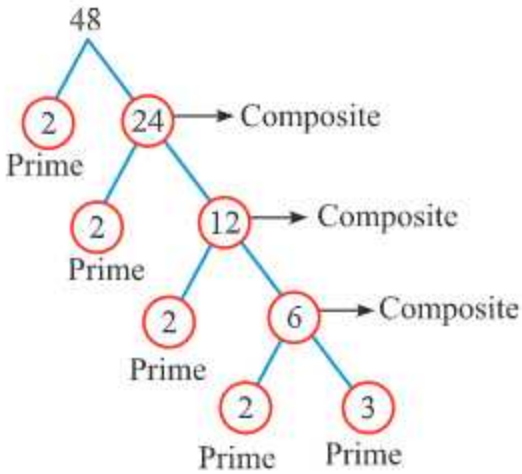
A composite number can be written as the product of prime factors. This is called prime factorisation. There are two methods of prime factorisation.

(*a*) Factor Tree Method (*b*) Division Method

(*a*) Factor Tree Method :

In this method, we factorise a composite number till we get all prime factors.

Let us factorise 48 using this method.



The Prime factorisation of 48 is $= 2 \times 2 \times 2 \times 2 \times 3$.

(*b*) Division Method :

In this method, we start dividing the given number by the smallest prime number and continue division by prime numbers till we reach 1.

2	48
2	24
2	12
3	6
2	2
	1

[Divide by the smallest prime number]

[Continue on dividing with the prime numbers till we get 1].

The prime factorisation of $48 = 2 \times 2 \times 2 \times 2 \times 3$

3.5 Highest Common Factor (H.C.F.)

Activity :

Teacher - How many students are there in 4th class of our school.

Students - Sir, 18 students.

Teacher - Now tell, how many students are in 5th class ?

Students - Sir, 27 students.

Teacher - We will play a game by forming teams from both classes. In each team, we will take equal number of students. Now tell, how many students can participate in one team so that no student is left ?

Students - Sir, there can be 7 students in each team.

Teacher - No students, we can take 9 students in each team.

Let us learn how we can divide them :

Factors of 18 = 1, 2, 3, 6, 9, 18

Factors of 27 = 1, 3, 9, 27

Highest common factor of 18 and 27 is 9. So, we shall make teams of 9 students each so that no child is left out of the team. Therefore, 9 is the H.C.F. of 18 and 27.

For Example : 35 is divisible by 5.

So 5 is a factor of 35 and 35 is multiple of 5 i.e, $5 \times 7 = 35$.

5 and 7 are factors of 35 or 35 is multiple of 5 and 7.

Similarly : $2 \times 3 \times 5 = 30$; 2, 3 and 5 are factors of 30.

In above example, observe the factors of 30 and 35. In both, 5 is the common factor.

So, 5 is the HCF of 30 and 35.

Things to Remember

- The greatest common factor of two or more than two numbers is their H.C.F.
- If HCF of two numbers is 1 then that numbers are called Co-Prime numbers.

Hints For Teacher Teacher will take examples from daily life with the help of a measuring tape to measure exact length and breadth of the floor, measuring weight etc

H.C.F.

We can find HCF by two methods :

(*a*) Prime factorisation method (*b*) Division method

3.5.1 Prime Factorisation Method

First of all, we will find all the prime factors of the given numbers and list the prime factors which are common to all.

Now, the product of these common factors is the required H.C.F.

Example 1 : Find HCF of 20 and 30 using prime factorisation method.

Solution :

2 | 20
2 | 10
5 | 5
1

2 | 30
3 | 15
5 | 5
1

Prime factorisation of 20 $= 2 \times 2 \times 5$

Prime factorisation of 30 $= 2 \times 3 \times 5$

Common prime factors = 2 and 5

So HCF is $2 \times 5 = 10$.

Example 2 : Find HCF of 45, 90 and 105 using prime factorisation method.

Solution :

3 | 45
3 | 15
5 | 5
1

2 | 90
3 | 45
3 | 15
5 | 5
1

3 | 105
5 | 35
7 | 7
1

Prime factorisation of $45 = 3 \times 3 \times 5$

Prime factorisation of $90 = 2 \times 3 \times 3 \times 5$

Prime factorisation of $105 = 3 \times 5 \times 7$

Common prime factors = 3 and 5

So HCF $= 3 \times 5 = 15$

3.5(2) To find HCF using Division method :

To find HCF of two numbers, we follow the steps given below:

- Make the smaller number as divisor and the larger number as dividend and divide.
- The remainder (if not zero) becomes the new divisor and the last divisor becomes the new dividend.
- Continue the process till we get zero as remainder.
- The last divisor is the required HCF.

The following example will show how we get HCF using division method

Example 1 : Find the HCF of 75 and 105 by using the division method.

Solution : We divide 105 by 75 the remainder is 30. Now divide 75 by 30 and continue this process till we get zero as remainder.

$$
\begin{array}{r}
75\overline{)105}\,(1 \\
-75 \\
\hline
30\overline{)75}\,(2 \\
-60 \\
\hline
15\overline{)30}\,(2 \\
-30 \\
\hline
0
\end{array}
$$

So, H.C.F. = 15

Example 2 : Find the HCF of 60, 90 and 130 by using division method.

Solution : First find HCF of any two numbers.

$$
\begin{array}{r}
60\overline{)\ 90}\,(1 \\
-60 \\
\hline
30\overline{)60}\,(2 \\
-60 \\
\hline
0
\end{array}
$$

HCF of 60 and 90 is 30.

Now find HCF of 30 and 130.

$$
\begin{array}{r}
30\overline{)130}\,(4 \\
-120 \\
\hline
10\overline{)30}\,(3 \\
-30 \\
\hline
0
\end{array}
$$

So, HCF of 60, 90 and 130 is 10.

Example 3 : Three containers contain 18 *l*, 27 *l* and 36 *l* oil respectively. What capacity of measuring vessel can measure oil of all the three containers exactly ?

Solution : We need such a measuring vessel which can measure oil of all three containers exactly. For that, we will find the HCF of all three containers.

```
18) 27 (1            9) 36 (4
   −18                 −36
   ------              ----
     9) 18 (2             0
       −18             ----
       ----
         0
       ----
```

A vessel of 9*l* can measure oil of all three containers exactly.

Exercise-3.2

1. Write the prime numbers from the following :

(*a*)	12	8	5	7	6	3
(*b*)	2	9	11	13	16	21
(*c*)	10	5	25	35	42	33
(*d*)	18	41	23	17	19	27
(*e*)	27	29	37	47	49	39

2. Write the composite numbers from the following :

(*a*)	14	7	9	6	5
(*b*)	21	12	18	17	11
(*c*)	23	32	37	41	15
(*d*)	10	25	5	7	9
(*e*)	43	24	47	49	50

3. Find HCF of following numbers using Prime factorisation.

(a) 18, 27 (b) 21, 63 (c) 80, 100 (d) 42, 98

4. Find HCF of following numbers using Prime factorisation.

(a) 30, 50, 70 (b) 24, 32, 40

(c) 36, 60, 72 (d) 25, 30, 35

5. **Find HCF of following number using Prime factorisation.**

(a) 42, 84 (b) 45, 90

(c) 16, 64, 80 (d) 45, 90, 105

6. **Find HCF of following numbers using Division method.**

(a) 48, 60 (b) 120, 140

(c) 12, 18, 64 (d) 60, 96, 128

7. Find the largest number which divides 60,75 and 90 without any remainder

8. There are three drums that contain 36 *l*, 45 *l* and 72 *l* milk respectively. Find the largest vessel which can measure milk of all three drums completely.

3.6 Lowest Common Multiple (L.C.M.)

Teacher : In our 5th class, find out the least number of students that can form teams of 3 students each and 4 students each in a way that no student is left out.

Teacher - Teacher will call the first team of 3 students and ask them if it is possible to make a team of 4 students out of 3 ?

Students - No, Sir.

Now, teacher will call another team of 3 students and ask them if it is possible to make a team of 4 students out of these. If possible, is any child left out of the team ?

Students - Yes Sir, two students will be left out after forming of team of 4 students.

Teacher - (Calls one more team of 3 students). Is it possible to make team of 4 students out of all students, standing near to me ? If so then how many students will be left out ?

Students - Yes, one more team can be formed but one student will be left out.

Teacher - (Calls one more team of 3 students.) Now can we make another team of 4 students ? If possible, is any student left out of the team.

Students - Yes, one more team will be formed. No student will be left out.

The Teacher will explain that first, we made four teams of 3 students each, then with these students, we formed teams of 4 students. We find that we need minimum 12 students to form teams of 3 student and 4 students each. This activity is based on Lowest Common Multiple (LCM).

So, the smallest multiple of 3 and 4 is 12. This smallest multiple is called LCM.

Activity

To find LCM using a game activitiy i.e., write numbers 1 to 100 in a grid of 10 × 10.

To find LCM of 3, 4 and 6, call three students.

1. Tell the first student to put the blue dart on the multiples of 3.

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

2. Tell the second student to put the yellow dart on the multiples of 4.

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

3. Tell the third student to put the green dart on the multiples of 6.

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

Teacher will tell the students that in the grid when three darts of different colours are together in the same box the first number with three coloured darts will be the L.C.M.

So, LCM of 3, 4 and 6 is 12.

Note Teachers are advised to use button, bindi etc. as per their convenience.

The teacher will give some more examples using different numbers.

Now write the multiples of 8 and 12

First Child - Multiples of 8 = 8, 16, 24, 32, 40, 48, 56, 64, 72 .....

Second Child - Multiples of 12 = 12, 24, 36, 48, 60, 72 .....

Look at these multiples carefully and write the common multiples.

So the common multiples are : 24, 48, 72 ....

The multiples of two different numbers will be infinite.

But out of these multiples, the smallest common multiples is known as L.C.M.

So, the LCM of 8 and 12 is 24

Things to Remember

- The LCM is the smallest common multiple among the multiples of two or more than two numbers.
- If one number is also the multiple of another number then the multiple itself is the L.C.M. of the two numbers

We can find LCM by using the following methods :

(a) LCM through multiples

(b) LCM using Prime factorisation

(c) LCM using Division Method.

Hint for the Teacher The teacher will do on activity. He will choose two students, one of whom will be told to jump to a distance of 2 feet and the other one to a distance of 3 feet. They will keep convering distance with jumps till they reach the same distance. Similarly LCM method can be used in making teams and in other day to day activites.

3.6(1) LCM through Multiples :

In this method, first of all we will find the multiples of given numbers. Then we will list the common multiples of given numbers. Now the lowest common multiple is the required LCM.

Let us consider one example.

Example 1 : Find LCM of 3, 6 and 9.

Solution : Multiples of 3 = 3, 6, 9, 12, 15, 18, 21, 24...., ..., ...

Multiples of 6 = 6, 12, 18, 24, 30, 36, 42 ...., ..., ...

Multiples of 9 = 9, 18, 27, 36, 45...., ..., ...

Common multiples of 3, 6 and 9 = 18, 36 ...., ..., ...

Lowest common Multiple = 18

So, LCM of 3, 6 and 9 is 18.

3.6(2) LCM using Prime Factorisation :

In this method, we will first list the prime factors of the numbers and then multiply the common factors and the remaining prime factors.

Let us consider one example.

Example 2 : Find LCM of 12 and 48 using Prime factorisation.

Solution :

$12 = 2 \times 2 \times 3$

$48 = 2 \times 2 \times 2 \times 2 \times 3$

Common Factors $= 2 \times 2 \times 3$

Remaining factors $= 2 \times 2$

L.C.M. $= 2 \times 2 \times 3 \times 2 \times 2$

$= 48$

2	12
2	6
3	3
	1

2	48
2	24
2	12
2	6
3	3
	1

Or

In both, prime factorisation , 2 has occurred maximum four times and 3 has occurred maximum one time.

So, LCM = $2 \times 2 \times 2 \times 2 \times 3 = 48$.

3.6(3) LCM using Common Division Method :

In this method, we follow the steps given below:

- Divide with the smallest prime number, which can divide at least one of the given numbers. Bring down the numbers that cannot be divided further.
- Continue division with the smallest possible prime numbers till the last point till we get 1.
- In this way, the prime factors will be multiplied resulting in LCM.

LCM can be further understood with the following example.

Example 3 : Find LCM of 6 and 12 using division method.

Solution :

2	6, 12
2	3, 6
3	3, 3
	1, 1

LCM of 6 and 12 = $2 \times 2 \times 3 = 12$

Example 4 : Find LCM of 8, 12 and 24.

Solution :

2	8, 12, 24
2	4, 6, 12
2	2, 3, 6
3	1, 3, 3
	1, 1, 1

LCM of 8, 12 and 24 = $2 \times 2 \times 2 \times 3 = 24$

Exercise-3.3

1. Find LCM of the following :

(a) 5, 10 (b) 6, 18 (c) 25, 50 (d) 6, 24

2. Find LCM of the following :

(a) 4, 8 and 12 (b) 6, 12 and 24

(c) 15, 18 and 27 (d) 24, 36 and 40

3. **Find LCM of following using Prime factorisation.**

(a) 32, 40 (b) 24, 36

(c) 15, 30 and 45 (d) 40, 44 and 48

4. **Find LCM of following using Division method:**

(a) 15, 20 (b) 12, 38

(c) 30, 45 and 50 (d) 40, 68 and 60

5. Find the smallest number which is divisible by 12, 15 and 20 completely.

6. One child jumps 3 feet high and another child jumps 4 feet high. If both the children continue jumping together in same direction then after how many feet they will be together again ?

7. How many minimum number of students are required from a class to make groups of 4 each and 5 each so that no student is left ?

8. Three bells ring with a time gap of 10 min, 20 min and 30 min respectively in a school. If all bells are rung together at 8 : 00 am then after how long the bells would ring together again ?

Multiple Choice Questions (MCQs)

1. **Which number is smallest even Prime number ? ..... .**

(a) 0 (b) 1 (c) 2 (d) 4

2. **Which number is neither Prime nor Composite ?**

(a) 1 (b) 2 (c) 3 (d) 4

3. **Which numbers are Prime numbers between 70 and 80 ?**

(a) 71, 72, 73 (b) 71, 75, 79 (c) 71, 80 (d) 71, 73 79

4. **HCF of 75 and 90 = ...**

(a) 5 (b) 10 (c) 15 (d) 20

5. **LCM of 12, 18 and 24 = ...**

(a) 72 (b) 36 (c) 48 (d) 24

6. **If HCF of any two numbers is 8 then out of following which can not be LCM of that numbers ?**

(a) 48 (b) 60 (c) 24 (d) 56

7. **What is length of largest tape which can measure the lengths of 24 m and 30 m ?**

(a) 4 m (b) 5 m (c) 6 m (d) 7 m

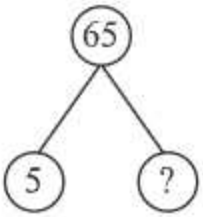
8. **What is the smallest number which is divisible by 8 and 12 ?**

(a) 16 (b) 48 (c) 72 (d) 24

9. **LCM of 26 and 39 = ...**

(a) 13 (b) 78 (c) 39 (d) 26

10.



(a) 5 (b) 65 (c) 12 (d) 13

11. **Which number is composite number in the following ?**

(a) 43 (b) 23 (c) 21 (d) 37

12. **Out of the following, which number is multiple of 19 ?**

(a) 171 (b) 172 (c) 173 (d) 174

13. **HCF of 15, 45 and 105 = ...**

(a) 15 (b) 5 (c) 30 (d) 45

14. **What is the HCF of two prime numbers ?**

(a) 1 (b) 2 (c) 3 (d) 4

15. Three bells ring with the time gap of 10 min, 15min and 20min respectively in a school. If all bells are rung together at 9 : 00 am then after how long the bells would ring together again ?

(a) 11:00 o'clock (b) 08:00 o'clock

(c) 10:00 o'clock (d) 12:00 o'clock

Read this pattern carefully and answer questions (16 – 20)

First odd number	1	$1 = 1 = 1 \times 1$
First 2 odd numbers	1, 3	$1 + 3 = 4 = 2 \times 2$
First 3 odd numbers	1, 3, 5	$1 + 3 + 5 = 9 = 3 \times 3$
First 4 odd numbers	1, 3, 5, 7	$1 + 3 + 5 + 7 = 16 = 4 \times 4$

First Even number	2	$2 = 2 = 1 \times 2$
First 2 even numbers	2, 4	$2 + 4 = 6 = 2 \times 3$
First 3 even numbers	2, 4, 6	$2 + 4 + 6 = 12 = 3 \times 4$
First 4 even numbers	2, 4, 6, 8	$2 + 4 + 6 + 8 = 20 = 4 \times 5$

16. Read the above pattern and find the sum of first 6 Odd numbers.

(a) 30 (b) 12 (c) 25 (d) 36

17. Read the above pattern, find the sum of first 10 Odd numbrs

(a) 20 (b) 50 (c) 100 (d) 40

18. Read the above pattern, Find the sum of first 8 Even numbers

(a) 16 (b) 24 (c) 72 (d) 64

19. Read the above pattern, find sum of first 9 Even number.

(a) 19 (b) 18 (c) 45 (d) 90

20. On a given road, the poles are erected at a distance of 24 m each and pile of stones are lying at a distance of 30 m each. If the Ist pile of stones is lying adjacent to the fist pole, at what distance will the pole and the pile of stones be together again ?

(a) 100 m (b) 110 m

(c) 150 m (d) 120 m

Facts :

- A number with unit digit 0, 2, 4, 6, 8 is divisible by 2, then 2 is the factor of that number.
- A number with unit digit 0 and 5 is divisible by 5, then 5 is the factor of that number.
- A number with unit digit 0 is divisible by 10.
- If sum of digits of any number is divisible by 3 then that number is divisible by 3.

Learning Outcomes

Students will have learnt the following :

- Finding HCF and LCM of numbers.
- Use of different methods such as prime factorisation, division method of HCF and LCM.
- To solve the problems of HCF and LCM in daily life.
- Prepare for competitive exam.

Answers

Exercise 3.1

1. (a) 5, 10, 15, 20, 25 (b) 9, 18, 27, 36, 45
(c) 10, 20, 30, 40, 50 (d) 12, 24, 36, 48, 60
(e) 16, 32, 48, 64, 80 (f) 17, 34, 51, 68, 85

2. (a) 1, 5 (b) 1, 2, 4, 8
(c) 1, 2, 7, 14 (d) 1, 2, 3, 4, 6, 12
(e) 1, 5, 25 (f) 1, 2, 3, 4, 6, 9, 12, 18, 36

3. (a) 1, 2, 3, 6, 9, 18 (b) 1, 2, 3, 4, 6, 8, 12, 24
(c) 1, 5, 7, 35 (d) 1, 2, 3, 4, 6, 9, 12, 18, 36
(e) 1, 3, 5, 9, 15, 45 (f) 1, 3, 7, 21

4. (a) 12, 34, 16, 28 (b) 48, 72, 90

(c) 450, 568, 664, 98 (d) 456, 968, 604, 888

(e) 136, 446, 1278 (f) 168, 5864

5. (a) 11, 23, 19, 35 (b) 45, 69, 97

(c) 451, 215, 789, 983 (d) 237, 739

(e) 631, 135, 249, 1279, 2851 (f) 49, 765, 1729, 9261, 6859

6. (a) 4 and 9 (b) 8 and 7

(c) 3, 5 and 6 (d) 80

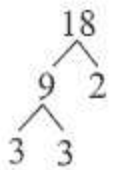
(e) 2, 3 and 5

7. (a) True (b) False (c) True (d) False

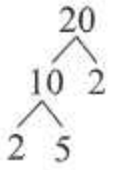
(e) True (f) False (g) False (h) False

(i) False (j) False

8. (b)



(c)



9. [2] – [38] – [19]

[5] – [85] – [17]

[3] – [39] – [13]

[11] – [77] – [7]

10. (a) odd (b) even (c) odd (d) odd

(e) even

Exercise 3.2

1. (a) 5, 7, 3 (b) 2, 11, 13

(c) 5 (d) 41, 23, 17, 19

(e) 29, 37, 47

2. (a) 14, 9, 6 (b) 21, 12, 18 (c) 32, 15 (d) 24, 49, 50

3. (a) 9 (b) 21 (c) 20 (d) 14

4. (a) 10 (b) 8 (c) 12 (d) 5

5. (a) 42 (b) 45 (c) 16 (d) 15

6. (a) 12 (b) 20 (c) 2 (d) 4

7. 15

8. 9 *l*

Exercise 3.3

1. (a) 10	(b) 18	(c) 50	(d) 72
2. (a) 24	(b) 24	(c) 270	(d) 360
3. (a) 160	(b) 72	(c) 90	(d) 2640
4. (a) 60	(b) 228	(c) 450	(d) 2040

5. 60 **6.** 12 Feet **7.** 20 Children

8. 9.00 am

Multi Choice Questions (MCQ)

1. c	**2.** a	**3.** d	**4.** c
5. a	**6.** b	**7.** c	**8.** d
9. b	**10.** d	**11.** c	**12.** a
13. a	**14.** a	**15.** c	**16.** d
17. c	**18.** c	**19.** d	**20.** d

Chapter -4

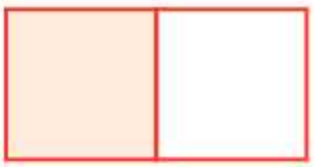
Fractions

Objectives :
1. To give knowledge about fractional part of a group to the students.
2. To give knowledge about comparison of Fractions.
3. Conversion of Fraction into decimal and decimal into fraction.
4. Importance of Fractions in daily life.

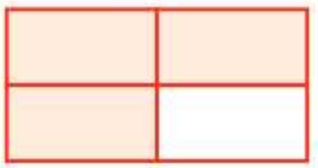
Recap

First of all we shall revise 4th class work.

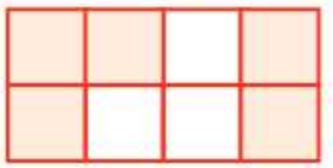
1. Write the Fraction of coloured part in the following diagrams :



(a)



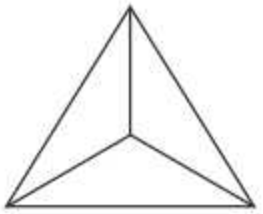
(b)



(c)

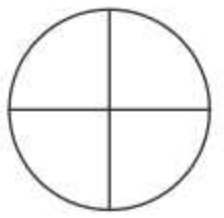
2. Colour the diagram according to given fraction :

(a) $\frac{2}{3}$



(b) $\frac{3}{5}$

(c) $\frac{1}{4}$



3. In fraction $\frac{2}{3}$, numerator is ☐ and denominator is ☐.

4. In fraction $\frac{1}{2}$, numerator is ☐ and denominator is ☐.

5. Write the fraction with numerator 4 and denominator 5 : ☐

In 4th class, you have studied about fraction of a whole. Here, a whole is divided into equal parts, which is called denominator and out of these parts the special part is considered as numerator.

In this class, we will study fraction of a group.

4.1 Fraction of a group :

Here one group is considered as whole. Total quantity is considered as denominator and requirement of special parts out of total is called numerator.

Activity

Harish has 7 apples and he gives 3 apples to his friend Naresh. Since, we have talked about 7 apples, so denominator of fraction is 7 and 3 apples are given to Naresh, so numerator of fraction is 3. Now Naresh has $\frac{3}{7}$ of apples.

Example 1 : Out of the following group of stars :

(a) Make fraction of coloured stars.

(b) Make fraction of stars without colour.

Solution : (a) There are 5 stars in the group and 2 are coloured. So fraction of coloured stars is $\frac{2}{5}$.

(b) Total stars in the group are 5. Out of which 3 stars are without colour. So fraction of stars without colour is $\frac{3}{5}$.

Exercise-4.1

1. Out of the following group of stars :

(a) Write the fraction of coloured stars. ☐

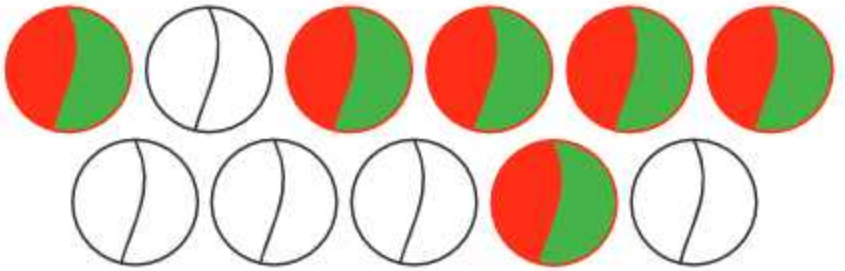
(b) Write fraction of stars without colour. ☐

2. In the following diagram :

(a) Write fraction of coloured ice creams ☐

(b) Write fraction of ice creams without colour ☐

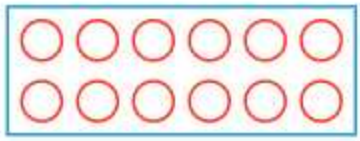
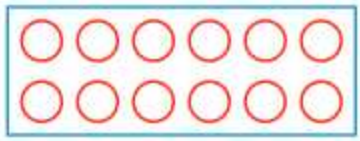
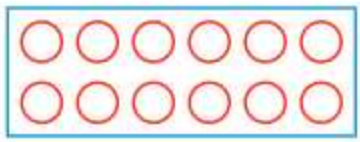
3. In the following diagram :



(a) Write fraction of coloured balls. ☐

(b) Write fraction of balls without colour. ☐

4. There are 12 balls in each of the following box.
Colour the balls according to given fraction in the box and write number of coloured balls in blank box :

	Diagrams	Fractions	No. of coloured balls
(a)		$\frac{1}{2}$	
(b)		$\frac{1}{3}$	
(c)		$\frac{1}{4}$	

4.2 Concept of Half, One third and One fourth in fraction :

We had already studied in previous classes that whole is divided into two equal parts and one part is called half and written as $\frac{1}{2}$.

Two halves make a whole

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

We have to divide a whole by two to get half of whole or group. When we ask our mother for half chapati, she divide it into two equal parts and give one part (half) to us.

Similarly, when we go to market for purchasing one dozen bananas then we get 12 bananas. But when we buy half of a dozen then we have 6 bananas. Because $12 \div 2 = 6$

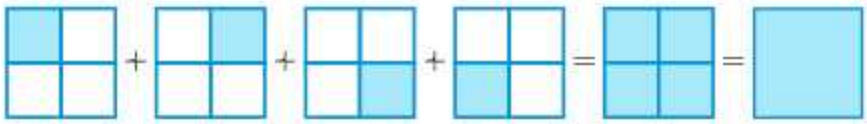
One third : When a whole or a group is divided into 3 equal parts then one part is called one-third of a whole and written as $\frac{1}{3}$.

Three one third make a whole

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

One-fourth : When a whole is divided into four equal parts then one part is called one-fourth and written as $\frac{1}{4}$.

Four, one Fourth make a whole.



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

$\frac{1}{4}$ of 12 bananas = $12 \div 4 = 3$ bananas

Similarly for getting $\frac{2}{3}$ of a whole or group we divide by 3 and multiply by 2.

For example $\frac{2}{3}$ of 12 bananas : $12 \div 3 = 4$ and $4 \times 2 = 8$ bananas.

Similarly for getting $\frac{3}{4}$ of a whole or group, we divide by 4 and multiply by 3.

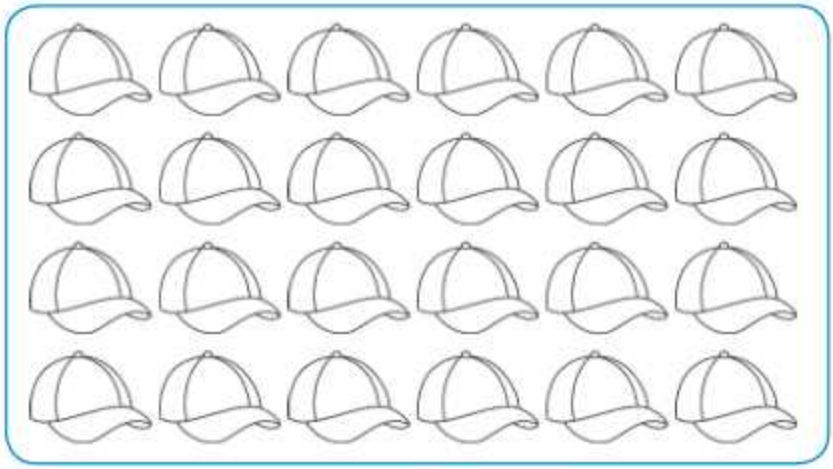
For example : $\frac{3}{4}$ of 12 bananas : $12 \div 4 = 3$ and $3 \times 3 = 9$ bananas.

Example 1 : Raju had birthday party. His father brought 24 caps for invited children. Out of these $\frac{1}{3}$ are red, $\frac{1}{2}$ are green and $\frac{1}{6}$ are yellow caps. Then

(a) How many children will have red coloured caps ?

(b) How many children will have green coloured caps ?

(c) How many children will have yellow coloured caps ?



Solution : (a) Total caps $= 24$

Fraction of red coloured caps $= \frac{1}{3}$

Number of red coloured caps $= 24 \div 3 = 8$

So, 8 children will have red coloured caps.

(b) Total caps $= 24$

Fraction of Green caps $= \frac{1}{2}$

Number of Green caps $= 24 \div 2 = 12$

So, 12 children will have green caps.

(c) Fraction of yellow caps $= \frac{1}{6}$

Number of yellow caps $= 24 \div 6 = 4$

So, 4 children will have yellow caps.

Hint for the Teacher The teacher will tell the children to colour the caps with red, green and yellow colours.

Exercise-4.2

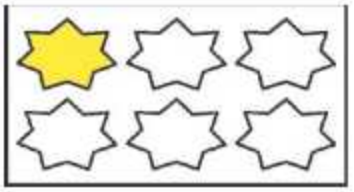
1. Match the following :

(a) 

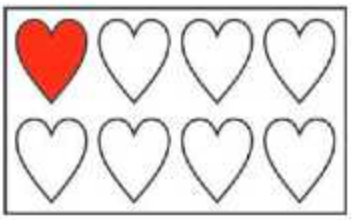
$\frac{1}{4}$ One-eighth

(b) 

$\frac{2}{3}$ One-fourth

(c) 

$\frac{1}{2}$ One-third

(d) 

$\frac{1}{6}$ Half

(e) 

$\frac{1}{8}$ One-sixth

(f) 

$\frac{1}{3}$ Two-third

2. Match the following :

(a)	$\frac{1}{10}$	(i)	One-fourth
(b)	$\frac{1}{2}$	(ii)	Half
(c)	$\frac{1}{4}$	(iii)	One-third
(d)	$\frac{1}{8}$	(iv)	One-sixth
(e)	$\frac{1}{6}$	(v)	One-tenth
(f)	$\frac{1}{3}$	(vi)	One-eighth

3. Fill in the blanks :

(a) $\frac{1}{3}$ part of 9 guavas = ☐ guavas

(b) $\frac{1}{6}$ part of 12 toffees = ☐ toffees

(c) $\frac{1}{6}$ part of 18 ice-creams = ☐ ice-creams

(d) $\frac{1}{4}$ part of 16 pencils = ☐ pencils

(e) $\frac{1}{10}$ part of ₹ 20 = ₹ ☐

(f) $\frac{1}{10}$ part of 100 pencils = ☐ pencils

(g) $\frac{1}{10}$ part of 100 cm = ☐ cm

(h) $\frac{1}{8}$ part of 32 laddoos = ☐ laddoos

4. Neha's uncle brought a big chocolate which looks as following diagram:

4.3 Comparison of Equivalent Fractions :

In previous class, we have learnt that we use a multiples of numerator and denominator in forming equivalent fractions. For example, Equivalent fractions of $\frac{3}{4}$ are $\frac{6}{8}, \frac{9}{12}, \frac{12}{16}$, ... etc.

Similarly, if we have to find that two fractions are equal or not, then we use multiplication as follows :

Cross multiply numerator of first fraction with the denominator of second fraction and denominator of first fraction with numerator of second fraction. If product of both cases are equal then fraction is equivalent fraction.

Example : To find $\frac{1}{3}$ and $\frac{3}{9}$ are equivalent or not.

Solution : Numerator and denominator of $\frac{1}{3}$ are 1 and 3 respectively.

Numerator and denominator of $\frac{3}{9}$ are 3 and 9 respectively.

Now, $\frac{1}{3} \times \frac{3}{9}$

(Numerator of first fraction) × (Denominator of second fraction) = $1 \times 9 = 9$

or $9 \times 1 = 9$

and (Denominator of first fraction) × Numerator of second fraction)

$= 3 \times 3 = 9$

Both the products are equal.

So, fractions are equivalent fractions.

Example 1 : Check $\frac{2}{3}$ and $\frac{4}{9}$ are equivalent fractions ?

Solution : (Numerator of first fraction) × (Denominator of second fraction)

$= 2 \times 9 = 18$

and

(Denominator of first fraction)×(Numerator of second fraction)

$= 3 \times 4 = 12$

Both the products are not equal, so these fractions are not equivalent.

Or $\frac{2}{3}$ and $\frac{4}{9}$

2×9 and 4×3

18 and 12

Both the products are not equal, so fractions are not equivalent fraction.

Example 2 : Are $\frac{3}{8}$ and $\frac{6}{16}$ equivalent fractions ?

Solution : (Numerator of first fraction) × (Denominator of second fraction)

$= 3 \times 16 = 48$

and

(Denominator of first fraction)×(Numerator of second fraction)

$= 8 \times 6 = 48$

Both the products are equal, so fractions are equivalent fractions.

Exercise-4.3

1. Check the following fractions are equivalent or not :

(a) $\frac{3}{7}$ and $\frac{6}{14}$ (b) $\frac{11}{14}$ and $\frac{77}{98}$ (c) $\frac{6}{9}$ and $\frac{24}{36}$

(d) $\frac{5}{8}$ and $\frac{10}{24}$ (e) $\frac{7}{12}$ and $\frac{14}{21}$ (f) $\frac{8}{9}$ and $\frac{40}{54}$

4.4 Lowest form of Fractions :

If the common factor of numerator and denominator is 1 then the fraction is in the lowest form. So, numerator and denominator of a fraction is divided by their HCF to convert into the simplest form. Let us consider the following example.

Example 1 : Check the fraction $\frac{21}{24}$ is in the lowest form. If not, then write its lowest form.

Solution : To check that $\frac{21}{24}$ is in the lowest form, first we find HCF of 21 and 24.

So, HCF of 21 and 24 = 3

So the fraction is not in the lowest form because HCF of numerator and denominator is not 1.

To convert it into the lowest form, divide numerator 21 and denominator 24 by 3.

$$\frac{21 \div 3}{24 \div 3} = \frac{7}{8}$$

So lowest form of $\frac{21}{24}$ is $\frac{7}{8}$.

Example 2 : Check $\frac{15}{17}$ is in the lowest form or not. If not, then write its lowest form.

Solution : First find HCF of 15 and 17.

and HCF of 15 and 17 = 1

So, $\frac{15}{17}$ is already in its lowest form.

Note : When we convert a fraction into its lowest form, then given fraction is equivalent fraction of lowest form.

As in Example 1 : $\frac{21}{24}$ is equivalent fraction of $\frac{7}{8}$.

Exercise-4.4

1. Check whether the following fractions are in its lowest form or not :

(a) $\frac{12}{14}$ (b) $\frac{21}{35}$ (c) $\frac{13}{17}$ (d) $\frac{25}{50}$ (e) $\frac{14}{21}$

(f) $\frac{8}{13}$ (g) $\frac{7}{15}$ (h) $\frac{14}{27}$ (i) $\frac{25}{35}$ (j) $\frac{18}{23}$

2. Write the lowest form of following fractions.

(a) $\frac{4}{8}$ (b) $\frac{12}{18}$ (c) $\frac{15}{20}$ (d) $\frac{35}{45}$ (e) $\frac{24}{36}$

(f) $\frac{8}{12}$ (g) $\frac{18}{21}$ (h) $\frac{25}{45}$ (i) $\frac{6}{12}$ (j) $\frac{9}{27}$

4.5 Like and Unlike fractions :

The fractions having same denominators are called like fractions and the fractions having different denominator are called unlike fractions. For example

In fractions $\frac{3}{8}, \frac{7}{8}, \frac{4}{8}, \frac{5}{8}$ and $\frac{2}{8}$, denominator is 8, so these are like fractions.

In fractions $\frac{3}{5}, \frac{7}{9}, \frac{4}{7}, \frac{5}{12}$ and $\frac{2}{17}$, denominators are different, so these are unlike fractions.

Example 1 : Write the like fractions of the following :

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

Solution : Like fractions are $\frac{3}{6}, \frac{5}{6}$ and $\frac{1}{6}$

4.6 Unit Fractions :

The fractions having 1 as numerator are called unit fraction.

Examples : $\frac{1}{5}, \frac{1}{9}, \frac{1}{7}, \frac{1}{12}$

Example 1 : Make a unit fraction whose denominator is 6.

Solution : Unit fraction with denominator 6 = $\frac{1}{6}$

4.7 Proper and Improper Fractions :

Fractions having numerator less than that denominator are called proper fraction.

For examples : $\frac{3}{5}, \frac{7}{9}, \frac{14}{17}$ have numerator less than that of denominator.

Fraction having numerator greater than that of denominator are called improper fraction.

For example : $\frac{8}{5}, \frac{13}{8}, \frac{24}{13}$ have numerator more than that of denominator.

Example 2 : Write the proper and improper fractions in the following :

$\frac{7}{12}, \frac{9}{4}$.

Solution : Proper fraction = $\frac{7}{12}$

[Because numerator is less than the denominator]

Improper fraction = $\frac{9}{4}$

[Because numerator is more than the denominator]

Exercise-4.5

1. Write the like and unlike fractions for the following groups :

(a) $\frac{3}{7}, \frac{5}{7}, \frac{1}{7}$ ☐

(b) $\frac{6}{9}, \frac{4}{9}, \frac{1}{9}$ ☐

(c) $\frac{9}{12}, \frac{7}{11}, \frac{7}{10}$ ☐

(d) $\frac{7}{10}, \frac{6}{10}, \frac{8}{10}$ ☐

(e) $\frac{5}{3}, \frac{5}{7}, \frac{5}{9}$ ☐

2. Write two like fractions for the following :

(a) $\frac{1}{5}, \frac{4}{5}, \frac{3}{5}, -, -$ (b) $\frac{3}{9}, \frac{4}{9}, \frac{7}{9}, -, -$ (c) $\frac{2}{7}, \frac{3}{7}, \frac{9}{7}, -, -$

3. **Write the unit fraction, whose denominator is as follows :**

(a) 7 (b) 5 (c) 8 (d) 3 (e) 15

4. **Which of the following fractions are proper and improper fractions :**

(a) $\frac{7}{12}$ (b) $\frac{8}{3}$ (c) $\frac{12}{18}$ (d) $\frac{3}{5}$ (e) $\frac{7}{9}$

4.8 Comparing and Ordering Fractions :

Activity

Teacher will have discussion with students about a party.

Karan and his friends are fond of cake. They brought four cakes and went to a park for party. Karan's friends sat in different groups as in following diagram. There is same cake with every group. Karan can sit in any group then the cake will be distributed between the children in the groups.

Scene of Party :

Karan

Group 1

Group 2

Group 3

Group 4

Teacher will ask from students that in which group Karan will sit ? Students will tell according to convenience.

Now teacher will ask the distribution of cake from the groups.

If Karan sits in 1 group then in that group, there were already 7 students. Now there will be

8 students in the group so cake will be divided in 8 equal parts. Karan will get $\frac{1}{8}$th part.

If Karan sits in group 2 then there will be 2 children in the group. Cake will be divided into two equal parts and Karan will get $\frac{1}{2}$ of cake.

If Karan sits in group 3 then there will be 4 children in the group and cake will be divided in 4 equal parts. Karan will get $\frac{1}{4}$th part of the cake.

If Karan sits in group 4 then there will be 3 students in that group. Cake will be divided into 3 parts and Karan will get $\frac{1}{3}$rd part of cake.

Now we can observe that out of $\frac{1}{8}, \frac{1}{2}, \frac{1}{4}$ and $\frac{1}{3}$ parts of cake, $\frac{1}{2}$ is the largest.

So, we conclude that when numerators of fractions are equal then fraction with smallest denominator will be largest. Similarly, in fractions of equal numerator, fraction with largest denominator will be smallest.

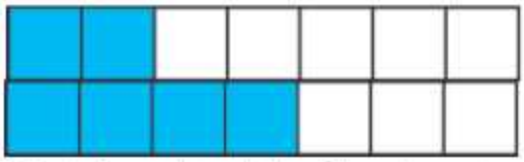
Example 1 : Which fraction is larger $\frac{2}{3}$ or $\frac{2}{7}$?

Solution : In given fractions, numerators are same. So, the fraction having smaller denominator will have larger value. So, the fraction $\frac{2}{3}$ is larger.

Teacher will announce in the class that I have some different chocolates in which some parts has nuts and some parts are without nuts. These chocolates looks like as follows : (Teacher will draw figure on Blackboard on.)

Chocolate-A

Chocolate-B



Teacher will tell that chocolate A has 7 parts, out of which 2 having nuts. So, we can say that part with nuts is $\frac{2}{7}$. Chocolate B has 4 parts out of 7 with nuts. So, the chocolate has $\frac{4}{7}$ part with nuts.

It is clear from above diagram that chocolate B has more nuts than chocolate A.

Fraction of chocolate A with nuts $= \frac{2}{7}$

Fraction of chocolate B with nuts $= \frac{4}{7}$

It concludes from diagram that fraction $\frac{4}{7}$ is greater than that of fraction $\frac{2}{7}$.

If two fractions has same denominator then fraction with larger numerator is greater and fraction with small numerator is smaller.

Example 2 : Which fraction is larger $\frac{3}{5}$ or $\frac{1}{5}$?

Solution : In given fractions, denominator is same. So, fraction with larger numerator is greater. So, $\frac{3}{5}$ is greater than $\frac{1}{5}$.

Example 3 : Write the fractions in ascending order : $\frac{4}{12}, \frac{4}{9}, \frac{4}{7}$ and $\frac{4}{15}$.

Solution : In given fractions, all fractions has same numerator. So the fraction with largest denominator is smallest means in above fraction $\frac{4}{15}$ is the smallest fraction.

So, ascending order is $\frac{4}{15}, \frac{4}{12}, \frac{4}{9}$ and $\frac{4}{7}$.

Example 4 : Write the fractions $\frac{7}{9}, \frac{8}{9}, \frac{3}{9}$ and $\frac{5}{9}$ in ascending order.

Solution : In above fraction, all fractions have same denominator. So the fraction with smaller numerator is smallest means $\frac{3}{9}$ is the smallest fraction.

So, ascending order is $\frac{3}{9}, \frac{5}{9}, \frac{7}{9}$ and $\frac{8}{9}$.

Exercise-4.6

1. Find the greater fraction for each part of the following :

(a) $\frac{2}{5}, \frac{2}{3}$ (b) $\frac{7}{9}, \frac{7}{12}$ (c) $\frac{1}{8}, \frac{1}{4}$ (d) $\frac{4}{6}, \frac{4}{8}$ (e) $\frac{3}{7}, \frac{3}{11}$

(f) $\frac{7}{9}, \frac{4}{9}$ (g) $\frac{3}{4}, \frac{1}{4}$ (h) $\frac{5}{8}, \frac{7}{8}$

2. Find the smaller fraction for each part of the following :

(a) $\frac{3}{5}, \frac{3}{4}$ (b) $\frac{5}{8}, \frac{5}{12}$ (c) $\frac{7}{9}, \frac{4}{9}$ (d) $\frac{3}{6}, \frac{3}{8}$ (e) $\frac{5}{7}, \frac{5}{11}$

(f) $\frac{8}{12}, \frac{5}{12}$ (g) $\frac{9}{4}, \frac{7}{4}$ (h) $\frac{9}{8}, \frac{7}{8}$

3. Write the following in increasing (ascending) order.

(a) $\frac{7}{12}, \frac{4}{12}, \frac{1}{12}, \frac{5}{12}$ (b) $\frac{5}{12}, \frac{5}{9}, \frac{5}{7}, \frac{5}{6}$ (c) $\frac{6}{11}, \frac{4}{11}, \frac{9}{11}, \frac{3}{11}$

(d) $\frac{7}{8}, \frac{7}{12}, \frac{7}{4}, \frac{7}{2}$ (e) $\frac{12}{15}, \frac{12}{13}, \frac{12}{17}, \frac{12}{10}$

Activity

Let us Play :

Cut 4 circles of cardboard of same size. Cut four of them into equal parts according to the following diagrams :

After this teacher can discuss more activities with students according to convenient environment.

4.9 Convert the fraction into Decimals :

As we know the table of place value system which is as follow :

Lakhs		Thousands		Units		
Ten lakh	Lakh	Ten thou-sand	thousand	Hun-dreds	Tens	Ones
10,00,000	1,00,000	10,000	1000	100	10	1

We have studied the units from moving right to left as 1 to lakh. Now we will extend these units starting from ones (left side) to right side.

Hundreds	Tens	Units	Tenth	Hundredth	Thousandth
100	10	1	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$

Teacher will tell to the students that $\frac{1}{10}$ (one-tenth) means that one part out of ten equal parts. We write this as 0.1 in decimal form and read as zero decimal one.

Similarly, decimals of different fractions are as follows :

(a) $\frac{3}{10} = 0.3$ (zero decimal three) (b) $\frac{5}{10} = 0.5$ (zero decimal five)

Any fraction having denominator 10, 100, 1000 etc. can be written in decimal from.

$\frac{1}{100}$ (one-hundredth) will be written 0.01 and read as zero decimal zero one.

Similarly $\frac{1}{1000}$ (one thousandth) will be written as 0.001 and read as zero decimal zero zero one.

Similarly some fractions are as follows :

(a) $\frac{4}{100} = 0.04$ (zero decimal zero four)

(b) $\frac{9}{1000} = 0.009$ (zero decimal zero zero nine)

(c) $\frac{35}{10} = 3.5$ (three decimal five)

4.9.1 Fractions not having denominator 10, 100, 1000 :

If any fraction not having denominators 10,100, 1000 etc. then we convert the denominators in 10, 100 and 1000 etc.

For example : In $\frac{1}{2}$ denominator is 2. To convert its denominator into 10, we have to multiply it by 5. If we multiply denominator by 5 then we've to multiply its numerator also by 5 so that fraction must have same value

$\frac{1\times5}{2\times5} = \frac{5}{10} = 0.5$ (Zero decimal five)

Example 1 : Convert $\frac{5}{4}$ into decimal.

Solution : First convert denominator 4 into 100 (because 10 is not multiple of 4).

So $\frac{5\times25}{4\times25} = \frac{125}{100} = 1.25$

While converting the fraction into decimals, after converting denominator in to 10, 100 or 1000 etc. put the decimal from right side leaving as many digits as there are zeros in the denominator.

For example : To convert $\frac{21}{10}$ into decimal. Write 21 and there is one zero in denominator. So, we put decimal from right side leaving one digit in numerator. So decimal formation of $\frac{21}{10}$ is 2.1.

If in numerator, number of digits are less than the number of zeros in denominator then we put zeros to left side of the numerator.

For example : To convert $\frac{48}{1000}$ into decimal. Write 48, now there are 3 zeros in denominator but in numerator we have only two digits. So we put two zeros on left side of digit 4 and we shall get 0048. Now we put decimal after leaving 3 digits from right side.

So, decimal formation of $\frac{48}{1000}$ is 0.048.

4.10 Convert Decimals into Fraction :

As we can convert every fraction into a decimal, similarly we can convert decimal into fractions. So in decimal formation, we shall write 10, 100, 1000 etc. in denominator according to decimal point.

$0.5 = \frac{5}{10}$

$0.02 = \frac{2}{100}$

Let us consider some examples.

Remember

It there is 1 digit after the decimal then denominator is 10.

If there are 2 digits, then denominator is 100.

If there are 3 digits then denominator is 1000.

Example 1 : Write 1.5 in fraction.

Solution : In given decimal, there is 1 digit after decimal point so in denominator, there shall be 10 and from numerator decimal point shall be removed. So, we have $1.5 = \frac{15}{10}$

In this example $\frac{15}{10}$ is not in lowest form. So to convert in lowest form, divide numerator and denominator by 5, as HCF of 10 and 15 is 5.

$$\frac{15 \div 5}{10 \div 5} = \frac{3}{2}$$

So $\frac{3}{2}$ is fraction of 1.5 .

Example 2 : Represent 3.25 in fractional form.

Solution : $3.25 = \frac{325}{100}$

HCF of 325 and 100 = 25

So $\frac{325 \div 25}{100 \div 25} = \frac{13}{4}$

$\frac{13}{4}$ is fractional form of 3.25

Exercise-4.7

1. Convert the following fractions into decimals :

(a) $\frac{9}{10}$ (b) $\frac{35}{100}$ (c) $\frac{31}{1000}$ (d) $\frac{117}{100}$ (e) $\frac{37}{10}$

2. Represent the following fractions into decimals :

(a) $\frac{3}{5}$ (b) $\frac{15}{20}$ (c) $\frac{4}{25}$ (d) $\frac{5}{4}$ (e) $\frac{7}{40}$

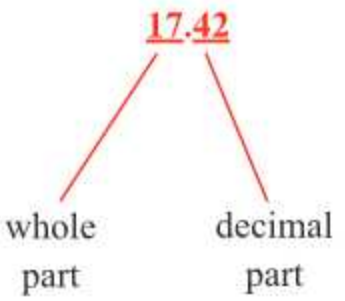
3. Represent the following decimals into fraction :

(a) 1.3 (b) 1.75 (c) 4.5 (d) 0.35 (e) 0.8

(f) 3.84 (g) 8.345 (h) 0.024 (i) 3.001 (j) 0.98

4.10.1 Like and Unlike Decimals :

We know decimal fractions has two parts : One part is whole number and other part is decimal.



- Decimals with same number of decimal places are called **like decimals.** For examples 3.48 and 5.65.
- Decimals having different number of decimal places are called **unlike decimals.** For examples : 3.4 and 5.65.
- We can convert the unlike decimals into like decimals. We may add as many zeros to the right of the last digit after the decimal point

as needed. It does not change the value of the decimal number. For example, 3.4 is same as 3.40. Now this is equivalent to another number 5.65.

Example 1 : Change the following decimals into like decimals :
7.3, 42.506, 0.4, 0.72, 418.33

Solution : In the given decimals, maximum number of decimal digits is 3.

So, we write all decimals in this way that they have 3 decimal digits.

$7.3 = 7.300$, $0.4 = 0.400$, $418.33 = 418.330$, $42.506 = 42.506$, $0.72 = 0.720$

4.11 Addition and Subtraction of Decimals :

Addition and Subtraction of decimals is same as addition and subtraction of simple numerals. To add/subtract the decimals, we follow the steps given below :

Convert the unlike decimals into like decimals.

Write the addends one below the other so that the decimal points of all addends are one below the other.

Add / subtract as you do while working with whole numbers.

Example 2 : Add 3.5, 4.2 and 6.1.

Solution :

$$\begin{array}{r} 3.5 \\ 4.2 \\ +\ 6.1 \\ \hline 13.8 \\ \hline \end{array}$$

Example 3 : Add 5.22, 7.6 and 8.105

Solution :

$$\begin{array}{rcr} 5.22 & \longrightarrow & 5.220 \\ 7.6 & \longrightarrow & 7.600 \\ +\ 8.105 & \longrightarrow & +\ 8.105 \\ \hline & & 20.925 \\ \hline \end{array}$$

Example 4 : Subtract 3.25 from 6.48

Solution :

$$\begin{array}{r} 6.48 \\ -\ 3.25 \\ \hline 3.23 \end{array}$$

Example 5 : Subtract 2.124 from 4.3.

Solution :

$$\begin{array}{rcr} 4.3 & \longrightarrow & 4.300 \\ 2.124 & \longrightarrow & -\ 2.124 \\ & & \hline & & 2.176 \end{array}$$

Exercise-4.8

1. Add the following decimal numbers :

(a) 2.4, 5.3 and 4.1 (b) 6.25, 5.65 and 3.01

(c) 4.32, 2.320 and 7.038 (d) 8.4, 7.03 and 2.432

(e) 12, 13.8 and 8.120

2. Find the difference of the following decimals/numbers :

(a) 8.82,7.31 (b) 6.9, 3.43

(c) 25.750, 15.375 (d) 45, 13.220

(e) 13.752, 9.27

4.12 Multiplication of decimals :

Multiplication and Division of decimals is same as of simple numerals. We follow the steps given below :

Step 1. Multiply the numbers as whole numbers ignoring the decimal point.

Step 2. Count the number of decimal places in the multiplicand multiplier and add the number of places.

Step 3. Put the decimal point in the product from the right, after as many digits as the total number of decimal places.

Step 4. If number of digits in the product is less than the number of decimal places. Then put decimal by writing 0 on left side of the product.

Example 1 : Find the product of the following :

(a) 3.24×4

Solution :

$$\begin{array}{r} 324 \\ \times\ 4 \\ \hline 1296 \\ \hline \end{array}$$

In this, we'have 3.24 as decimal number with two decimal digits. Put decimal after leaving two digits from right in the product 1296. So required answer is 12.96.

(b) 4.12×8

$$\begin{array}{r} 412 \\ \times\ 8 \\ \hline 3296 \\ \hline \end{array}$$

In 4.12, there are two decimals digits so put decimal after leaving two digits from right in the product 3296. So the product is 32.96

Example 2 : (a) 4.08×15

Solution :

$$\begin{array}{r} 408 \\ \times\ 15 \\ \hline 2040 \\ 4080 \\ \hline 6120 \\ \hline \end{array}$$

$4.08 \times 15 = 61.20$

(b) 6.13×1.4

$$\begin{array}{r} 613 \\ \times\ 14 \\ \hline 2452 \\ 6130 \\ \hline 8582 \\ \hline \end{array}$$

$6.13 \times 1.4 = 8.582$

4.13 Division of Decimals :

Division of Decimal number by a natural number or decimal number is same as simple division.

Example 1 : Divide 4.48 by 4.

Solution :

$$\begin{array}{r} 4\overline{)4.48}\,(\,1.12 \\ -4 \\ \hline 04 \\ -4 \\ \hline 08 \\ -8 \\ \hline 0 \\ \hline \end{array}$$

Example 2 : Divide 7.32 by 6.

Solution :

$$\begin{array}{r} 6\overline{)7.32}\,(\,1.22 \\ -6 \\ \hline 13 \\ -12 \\ \hline 12 \\ -12 \\ \hline 0 \\ \hline \end{array}$$

Example 5 : Divide 3.48 by 4

Solution :

$$
\begin{array}{r}
4\overline{)3.48}\,(\,0.87 \\
-0\downarrow \\
\hline
34 \\
-32\downarrow \\
\hline
28 \\
-28 \\
\hline
\times
\end{array}
$$

Exercise-4.9

1. **Find the product of the following decimal numbers :**

   (a) 5.15×6 (b) 52.4×2 (c) 0.31×5

   (d) 9.05×0.2 (e) 7.24×2.3

2. **Find the division of the following decimal numbers :**

   (a) $18.24 \div 3$ (b) $8.64 \div 4$ (c) $2.48 \div 8$

   (d) $16.5 \div 15$ (e) $34.3 \div 7$

Learning Outcomes

- Able to know about fractional part of a group.
- to compare the fractions
- Able to convert fraction into decimal & decimal into fraction.
- Able to understand the importance of a fractions in real life.

Answers

Exercise 4.1

1. (a) $\frac{4}{9}$ (b) $\frac{5}{9}$ **2.** (a) $\frac{2}{5}$ (b) $\frac{3}{5}$

3. (a) $\frac{6}{11}$ (b) $\frac{5}{11}$ **4.** (a) 6 (b) 3 (c) 2

Exercise 4.2

3. (a) 3 guavas (b) 2 toffees (c) 3 ice-creams (d) 4 pencils
(e) 2 Rupees (f) 10 pencils (g) 10 centimeter (h) 4 laddoos

4. (a) 8 (b) 2 (c) 4 (d) 2

5. (a) 6 hours (b) 8 hours (c) 2 hours (d) 2 hours
(e) 3 hours (f) 3 hours

Exercise 4.3

1. (a) Yes (b) Yes (c) Yes (d) No
(e) No (f) No

Exercise 4.4

1. (a) No (b) No (c) Yes (d) No
(e) No (f) Yes (g) Yes (h) Yes
(i) No (j) Yes

2. (a) $\frac{1}{2}$ (b) $\frac{2}{3}$ (c) $\frac{3}{4}$ (d) $\frac{7}{9}$
(e) $\frac{2}{3}$ (f) $\frac{2}{3}$ (g) $\frac{6}{7}$ (h) $\frac{5}{9}$
(i) $\frac{1}{2}$ (k) $\frac{1}{3}$

Exercise 4.5

1. (a) Like (b) Like (c) Unlike (d) Like
(e) Unlike

4. (a) Proper (b) Improper (c) Proper
(d) Proper (e) Proper

Exercise 4.6

1. (a) $\frac{2}{3}$ (b) $\frac{7}{9}$ (c) $\frac{1}{4}$ (d) $\frac{4}{6}$
(e) $\frac{3}{7}$ (f) $\frac{7}{9}$ (g) $\frac{3}{4}$ (h) $\frac{7}{8}$

2. (a) $\frac{3}{5}$ (b) $\frac{5}{12}$ (c) $\frac{4}{9}$ (d) $\frac{3}{8}$

(e) $\frac{5}{11}$ (f) $\frac{5}{12}$ (g) $\frac{7}{4}$ (h) $\frac{7}{8}$

3. (a) $\frac{1}{12}, \frac{4}{12}, \frac{5}{12}, \frac{7}{12}$ (b) $\frac{5}{12}, \frac{5}{9}, \frac{5}{7}, \frac{5}{4}$ (c) $\frac{3}{11}, \frac{4}{11}, \frac{6}{11}, \frac{9}{11}$

(d) $\frac{7}{12}, \frac{7}{8}, \frac{7}{4}, \frac{7}{2}$ (e) $\frac{12}{17}, \frac{12}{15}, \frac{12}{13}, \frac{12}{10}$

Exercise 4.7

1. (a) 0.9 (b) 0.35 (c) 0.031 (d) 1.17

(e) 3.7

2. (a) 0.6 (b) .75 (c) .16 (d) 1.25

(e) 0.175

3. (a) $\frac{13}{10}$ (b) $\frac{175}{100}$ (c) $\frac{45}{10}$ (d) $\frac{35}{100}$

(e) $\frac{8}{10}$ (f) $\frac{384}{100}$ (g) $\frac{8345}{1000}$ (h) $\frac{24}{1000}$

(i) $\frac{3001}{1000}$ (j) $\frac{98}{100}$

Exercise 4.8

1. (a) 11.8 (b) 14.91 (c) 13.678 (d) 17.862

(e) 33.92

2. (a) 1.51 (b) 3.47 (c) 10.375 (d) 31.780

(e) 4.482

Exercise 4.9

1. (a) 30.9 (b) 104.8 (c) 1.55 (d) 1.81

(e) 16.652

2. (a) 6.08 (b) 2.16 (c) 0.31 (d) 1.1

(e) 4.9

Chapter-5

Money (Currency)

Objectives :
1. To teach them how to use Rupees-paise in daily life.
2. To enable the students to convert rupees into paise.
3. To enable them to do Addition, Subtraction, Multiplication, Division of money.
4. To enable them to find value of total, exchange, unit value and multivalue through activities.

Recap

You have learnt to convert rupees into paise, addition, subtraction, multiplication and division of rupees. You have also learnt to write rupees in figures and in words.

Let us solve some examples.

1. *a.* Convert rupees into paise.

5 Rupees = ... Paise

7 Rupees = ... Paise

4 Rupees = ... Paise

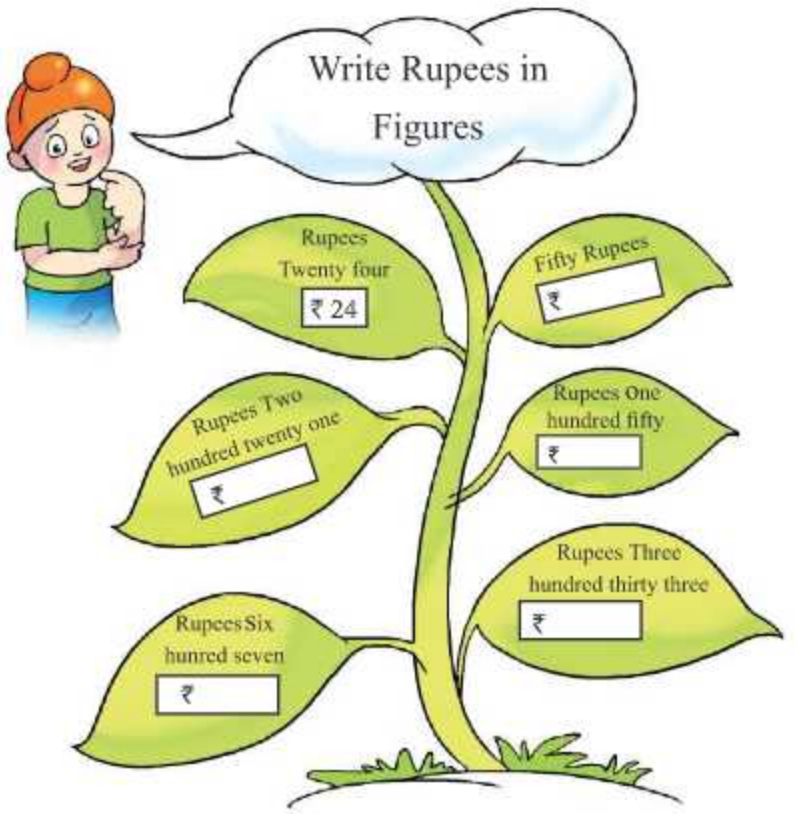
b. Find value :

₹ 157	₹ 258	₹ 759	₹ 425
+ ₹ 108	+ ₹ 504	+ ₹ 402	+ ₹ 315

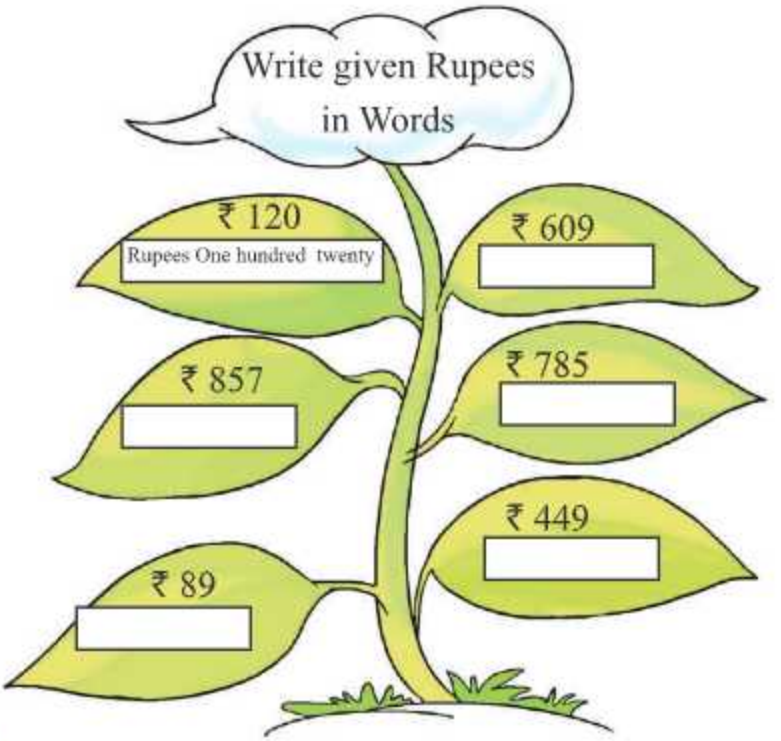
c. Find difference :

₹ 255	₹ 428	₹ 504	₹ 482
– ₹ 105	– ₹ 203	– ₹ 157	– ₹ 301

2. Write Rupees in figures :



3. Write Rupees in words :



Activity

5.1 Activity related to Daily life :

Harleen and his sister Supreet went to a stationery shop.

Harleen bought a chart and one box of colours from the shop. How many rupees did he give to the shopkeeper ?

₹ 10	+	₹ 35	=	₹ 45
Price of Chart		Price of Colour Box		

Supreet bought one bag and one geometry box from the shop. How many rupees did she give to the shopkeeper ?

₹ 200	+	₹ 70	=	₹ 270
Price of Bag		Price of Geometry Box		

Money has very important place in daily life. We can buy and sell, things with money. We can also save money for other things.

We should respect our country's currency and should not spoil it by writing on it.

Money is a combination of Rupees and Paise.

 +  = ₹ 15

 +  +  = ₹ 110.50

The way to write rupees and paise collectively

Decimal (Dot) is used for separating Rupees and paise. Rupees are written on the left side of decimal and paise are written on the right side of decimal.

Example - Rupees 220 Paise 50 = ₹ 220.50

Write the given amount into rupees and paise.

	₹ 117.50	Rupees one hundred seventeen and fifty paise
		
		
		
		

5.2 Conversion of Rupees into Paise :

1 Rupee (₹ 1) = 100 Paise

When a Rupee is converted into paise then it is mutiplied by 100.

Example 1 : Convert the following rupees into paise :

(*a*) ₹ 11 (*b*) ₹ 6.25 (*c*) ₹ 32.64

Solution : (*a*) ₹ 11 = 11 × 100 = 1100 paise

(*b*) ₹ 6.25 = (6 × 100 + 25) paise

(600 + 25) paise = 625 paise

(*c*) ₹ 32.64 = (32 × 100 + 64) paise

= (3200 + 64) paise

= 3264 paise

5.3 Conversion of Paise into Rupees :

We know 100 paise = ₹1

$$\text{and 1 paisa} = ₹\ \frac{1}{100}$$

To convert paise into rupees :

- Divide amount of paise by 100.
- Put Decimal by leaving two digits of numerator from right side to left side.
- Now we shall get rupees on left side and paise on right side of decimal.

Example 2 : Convert the following Paise into Rupees.

(*a*) 400 paise (*b*) 875 paise (*c*) 1232 paise

Solution : (*a*) $400 \text{ paise} = ₹\ \frac{400}{100} = ₹\ 4$ $\left[\text{because 1 paisa} = ₹\ \frac{1}{100}\right]$

(*b*) $875 \text{ paise} = ₹\ \frac{875}{100} = ₹\ 8.75$

(*c*) $1232 \text{ paise} = ₹\ \frac{1232}{100} = ₹\ 12.32$

Exercise 5.1

1. Convert the following Rupees into Paise :

(*a*) ₹ 15 (*b*) ₹ 8.13 (*c*) ₹ 12.63 (*d*) ₹ 13.50

(*e*) ₹ 98.75

2. Convert the following paise into rupees.

(*a*) 700 paise (*b*) 925 paise (*c*) 1972 paise

(*d*) 2816 paise (*e*) 3650 paise

3. Fill in the blanks :

(*a*) There are ....., 50 paise coins in ₹ 1.

(*b*) There are ..... , ₹ 2 coins in ₹ 10.

(*c*) There are ..... , 50 paise coins in ₹ 1.50

(*d*) There is a need of ..... , ₹ 10 notes to make ₹ 100.

(*e*) There is a need of ..... , ₹ 5 notes to make ₹ 20.

5.4 Addition and Subtraction of Money :

In 4th class, we have learnt addition and subtraction of rupees with rupees and paise with paise. In this class, we shall learn addition and subtraction of Rupees and paise together. Let us consider some examples :

Example 1 : Add ₹ 1735 paise 60 and ₹ 1624 paise 30.

Solution :

₹ 1735 paise 60
+ ₹ 1624 paise 30

₹ 3359 paise 90

Example 2 : Subtract ₹ 575.50 from ₹ 9108.70.

Solution :

₹ 9108.70
– ₹ 575.50

₹ 8533.20

Example 3 : Find the difference between ₹ 7185.35 and ₹ 375.75.

Solution :

₹ 7185.35
– ₹ 375.75
₹ 6809.60

Exercise 5.2

1. Solve the following :

(*a*) ₹ 1123.50 + ₹ 1242.40

(*b*) ₹ 2412.58 + ₹ 3279.60

(*c*) ₹ 5278.72 + ₹ 4132.24

(*d*) ₹ 3424.56 + ₹ 2316.74

(*e*) ₹ 4428 + ₹ 3240

(*f*) ₹ 5489.40 – ₹ 2242.18

(*g*) ₹ 2624.58 – ₹ 2216.26

(*h*) ₹ 5146.82 – ₹ 3118.28

(*i*) ₹ 3245.89 – ₹ 3123.64

(*j*) ₹ 124.48
₹ 313.23
+ ₹ 418.12

(*k*) ₹ 217.29
₹ 424.18
+ ₹ 326.64

2. Solve the following :

(*a*) ₹ 3138.65 + ₹ 2124.15 (*b*) ₹ 4472.85 + ₹ 5200.32

(*c*) ₹ 5245.18 + ₹ 4216.27 (*d*) ₹ 4580.42 – ₹ 2292.18

(*e*) ₹ 8314.24 – ₹ 5218.16

5.5 Problems related to Money in daily life :

In the last section, we have learnt addition/subtraction of simple amounts. Now we shall discuss problems related to money in our daily life.

Example 1 : Shelly bought a chocolate for ₹ 200, and packet of chips for ₹ 30 from a shop. How much money did she spend ?

Solution :

Price of chocolate = ₹ 200

Price of chips = ₹ 30

Money spent = ₹ 200

₹ 30

₹ 230

Shelly spent ₹ 230

Example 2 : Charan purchased a shirt for ₹ 1230, pants for ₹ 1746 and a belt for ₹ 1172 from the market. How much money had he spent ?

Solution :

Price of shirts = ₹ 1230

Price of pants = ₹ 1746

Price of Belt = ₹ 1172

Total money spent = ₹ 1230

₹ 1746

+ ₹ 1172

₹ 4148

Charan spent ₹ 4148

Example 3 : Arun purchased a suitcase for ₹ 3499 and gave ₹ 4000 note to the shopkeeper. How much money would he get back from the shopkeeper ?

Solution :

Price of suitcase = ₹ 3499

Money given to shopkeeper = ₹ 4000

Money given back = ₹ 4000

– ₹ 3499

₹ 501

Arun would get ₹ 501

Example 4 : Akashvir bought Sugar for ₹ 350, rice for ₹ 500 and pulses for ₹ 150 from a shopkeeper. How much total money had she spent ?

Solution :

Price of Sugar = ₹ 350
Price of Rice = ₹ 500
Price pulses = + ₹ 150
₹ 1000

Total money spent ₹ 1000

Exercise 5.3

1. Ravi bought a notebook for ₹ 50, book for ₹ 125 and bought a pen for ₹ 150. How much money did he spend ?
2. Manveet Kaur has ₹ 148.50 with her. Her father gave ₹ 116.50 to her. How much amount does she have ?
3. Paras purchased a bag for ₹ 450 and gave ₹ 500 to the shopkeeper. How much amount would he get back from the shopkeeper ?
4. Gurdeep has ₹ 1000 with him. He purchases shoes for ₹ 742. How much amount is left with him ?
5. Prabhjot has ₹ 2168.50 and her brother Simarjeet has ₹ 1248.50. How much amount did they both have ?
6. A shopkeeper had ₹ 1000. He bought a radio for ₹ 650. How much amount was left with him ?
7. Harleen went to the market with her friend. She bought goods worth ₹ 3467.50 and her friend bought goods worth ₹ 3350.25. How much did Harleen spend more then her friend ?
8. Avneet has purchased a shirt for ₹ 1865.90, pants for ₹ 1060.30 and a pair of shoes for ₹ 990.10 from a shop. How much total amount has he spent ?

5.6 Multiplication/Division Problems related to money :

In the last section, we have learnt the addition-subtraction of the problems related to money. In this section, we shall learn about the most important and useful part of life : Multiplication and division of the problems related to money in our daily life. Let us consider some examples.

Example 1 : Multiply the following amounts :

(a) ₹ 118 × 6 (b) ₹ 335 × 12 (c) ₹ 450 × 7

Solution :

(*a*) ₹ 118 × 6 = ₹ 708

(*b*) ₹ 335 × 12 = ₹ 4020

(*c*) ₹ 450 × 7 = ₹ 3150

Example 2 : Divide the following amounts :

(a) ₹ 2115 ÷ 5 (b) ₹ 4992 ÷ 16 (c) ₹ 5785 ÷ 13

Solution :

(a) $5\overline{)2115}(423$

-20

11

-10

15

-15

$\times$

(b) $16\overline{)4992}(312$

-48

19

-16

32

-32

$\times$

(c) $13\overline{)5785}(445$

-52

58

-52

65

-65

$\times$

₹ 2115 ÷ 5 = ₹ 423, ₹ 4992 ÷ 16 = ₹ 312, ₹ 5785 ÷ 13 = ₹ 445

Example 3 : The cost of a pen is ₹ 415. Find the cost of 18 such pens.

Solution :

Cost of a pen = ₹ 415

Cost of 18 such pens = ₹ 415 × 18

= ₹ 7470

Example 4 : The cost of a shirt is ₹ 1135. Find the cost of 6 such shirts.

Solution :

Cost of a shirt = ₹ 1135

Cost of 6 such shirts = ₹ 1135 × 6

= ₹ 6810

Example 5 : Avneet went to the market to buy chocolate for his birthday. The price of one packet of chocolate is ₹ 430. What is the cost of 12 such packets.

Solution :

Price of 1 packet = ₹ 430

Price of 12 such packets = ₹ 430 × 12

= ₹ 5160

Example 6 : The cost of 15 dozen bananas is ₹ 1440. Find the cost of 1 dozen banana.

Solution :

Cost of 15 dozen bananas = ₹ 1440

Cost of one dozen banana = ₹ 1440 ÷ 15

= ₹ 96

Example 7 : The price of a sugar bag is ₹ 2100. In a bag, there is 50 kg sugar. Find the price of 1 kg sugar.

Solution : Price of 50 kg sugar = ₹ 2100

Price of 1 kg sugar = ₹ 2100 ÷ 50

= ₹ 42

Exercise 5.4

1. **Find the value of the following :**

   (*a*) ₹ 258 × 17 (*b*) ₹ 410 × 20 (*c*) ₹ 518 × 18

   (*d*) ₹ 220 × 14 (*e*) ₹ 206 × 25

2. **Evaluate :**

   (*a*) ₹ 3120 ÷ 10 (*b*) ₹ 1590 ÷ 15 (*c*) ₹ 4272 ÷ 16

   (*d*) ₹ 4200 ÷ 20 (*e*) ₹ 6500 ÷ 25

3. The cost of a calculator is ₹ 415. Find cost of 17 such calculators.

4. The price of 1 kg Ghee is ₹ 435. What is the price of 18 kg Ghee?
5. The cost of 24 glasses is ₹ 2880. Find the cost of a glass.
6. The cost of 19 geometry boxes is ₹ 2850. Find the cost of a geometry box.
7. The price of 1 litre petrol is ₹ 73. What is the cost of 12 litre petrol.
8. The cost of 25 kg rice is ₹ 2000. Find the cost of 1 kg rice.
9. The price of 1 m cloth is ₹ 500. Find the cost of 18 m cloth.
10. **Fill in the Blanks :**

(*a*) ₹ 13 × 8 = ☐ (*b*) ₹ 24 × 5 = ☐

(*c*) ₹ 24 ÷ 3 = ☐ (*d*) ₹ 72 ÷ 8 = ☐

(*e*) ₹ 25 × 6 = ☐ (*f*) ₹ 100 ÷ 10 = ☐

(*g*) There are ☐ ₹ 100 notes in ₹ 1000.

(*h*) There are ☐ ₹ 50 notes in ₹ 300.

(*i*) There are ☐ ₹ 20 notes in ₹ 500.

(*j*) There are ☐ ₹ 500 notes in ₹ 2000.

Multiple Choice Questions (MCQs)

1. **What is the standard method of writing ₹ 13 and 50 paise ?**

(*a*) ₹ 1350 (*b*) ₹ 13.50 (*c*) ₹ 1350 paise (*d*) None

2. **How many ₹ 2 coins are there in ₹ 26 ?**

(*a*) 52 (*b*) 26 (*c*) 13 (*d*) 20

3. **What is the standard symbol of Indian currency ?**

(*a*) ₹ (*b*) $ (*c*) £ (*d*) None

4. **If the cost of a pen is ₹ 12. What is the cost of 11 pens ?**

(*a*) ₹ 120 (*b*) ₹ 23 (*c*) ₹ 1 (*d*) ₹ 132

5. **1 kg apples cost ₹ 80. What is the cost of half kg apples ?**

(*a*) ₹ 20 (*b*) ₹ 160 (*c*) ₹ 40 (*d*) ₹ 80

6. **The cost of a dozen pencils is ₹ 60. Find the cost of one pencil.**

(*a*) ₹ 12 (*b*) ₹ 5 (*c*) ₹ 60 (*d*) ₹ 30

7. **What is the amount of 7 notes of ₹ 20 ?**

(*a*) ₹ 27 (*b*) ₹ 14 (*c*) ₹ 140 (*d*) ₹ 13

8. **Convert 480 paise into rupees.**

(*a*) ₹ 4.80 (*b*) ₹ 48.00 (*c*) ₹ 480 (*d*) ₹ 8.40

9. **Sukhdev had spent ₹ 25 in a market and he was left with ₹ 25. How many rupees had he in the beginning ?**

(*a*) ₹ 25 (*b*) ₹ 5.00 (*c*) ₹ 50 (*d*) ₹ 40

10. **Find the value of ₹ 10.40 + ₹ 15.30 + ₹ 8.20.**

(*a*) ₹ 33.90 (*b*) ₹ 34.00 (*c*) ₹ 30.90 (*d*) ₹ 339

11. **The cost of a shirt is ₹ 999.90. How much estimate cost, will the shopkeeper take ?**

(*a*) ₹ 990 (*b*) ₹ 999 (*c*) ₹ 1000 (*d*) ₹999.95

12. **The cost of a daily newspaper is ₹ 4. What is the total cost of newspaper for the month of January ?**

(*a*) ₹ 124 (*b*) ₹ 12 (*c*) ₹ 35 (*d*) ₹ 25

13. **Anmol saves ₹ 5 daily from his pocket expenses. How many rupees has he saved in the month of March ?**

(*a*) ₹ 36 (*b*) ₹ 31 (*c*) ₹ 155 (*d*) ₹ 150

14. **The cost of 8 meter cloth is ₹ 680. What is the cost of 1 meter cloth?**

(*a*) ₹ 80 (*b*) ₹ 85 (*c*) ₹ 70 (*d*) ₹ 90

15. **How many coins of 50 paise will be there in ₹ 5 ?**

(*a*) 250 (*b*) 55 (*c*) 20 (*d*) 10

Learning Outcomes

- Will be able to make proper usage of Rupees/Paise in daily life.
- Will be able to convert Rupees into Paise
- Will be able to add, subtract, multiply and divide of money.
- Will be able to find the total value, one value, exchange and multivalue activities

Answers

Exercise 5.1

1. (*a*) 1500 paise (*b*) 813 paise (*c*) 1263 paise (*d*) 1350 paise (*e*) 9875 paise

2. (*a*) ₹ 7 (*b*) ₹ 9.25 (*c*) ₹ 19.72 (*d*) ₹ 28.16 (*e*) ₹ 36.50

3. (*a*) 2 (*b*) 5 (*c*) 3 (*d*) 10 (*e*) 4

Exercise 5.2

1. (*a*) ₹ 2365.90 (*b*) ₹ 5692.18 (*c*) ₹ 9410.96 (*d*) ₹ 5741.3
(*e*) ₹ 7668 (*f*) ₹ 3247.22 (*g*) ₹ 408.32 (*h*) ₹ 2028.54
(*i*) ₹ 122.25 (*j*) ₹ 855.83 (*k*) ₹ 968.11

2. (*a*) ₹ 5262.80 (*b*) ₹ 9673.17 (*c*) ₹ 9461.45 (*d*) ₹ 2288.24
(*e*) ₹ 3096.08

Exercise 5.3

1. ₹ 325 **2.** ₹ 265 **3.** ₹ 50 **4.** ₹ 258
5. ₹ 3417 **6.** ₹ 350 **7.** ₹ 117.25 **8.** ₹ 3916.3

Exercise 5.4

1. (*a*) ₹ 4386 (*b*) ₹ 8200 (*c*) ₹ 9324 (*d*) ₹ 3080
(*e*) ₹ 5150

2. (*a*) ₹ 312 (*b*) ₹ 106 (*c*) ₹ 267 (*d*) ₹ 210
(*e*) ₹ 260

3. ₹ 7055 **4.** ₹ 7830 **5.** ₹ 120 **6.** ₹ 150
7. ₹ 876 **8.** ₹ 80 **9.** ₹ 9000

10. (*a*) ₹ 104 (*b*) ₹ 120 (*c*) ₹ 8 (*d*) ₹ 9
(*e*) ₹ 150 (*f*) ₹ 10 (*g*) 10 (*h*) 6
(*i*) 25 (*j*) 4

Multiple Choice Questions (MCQ)

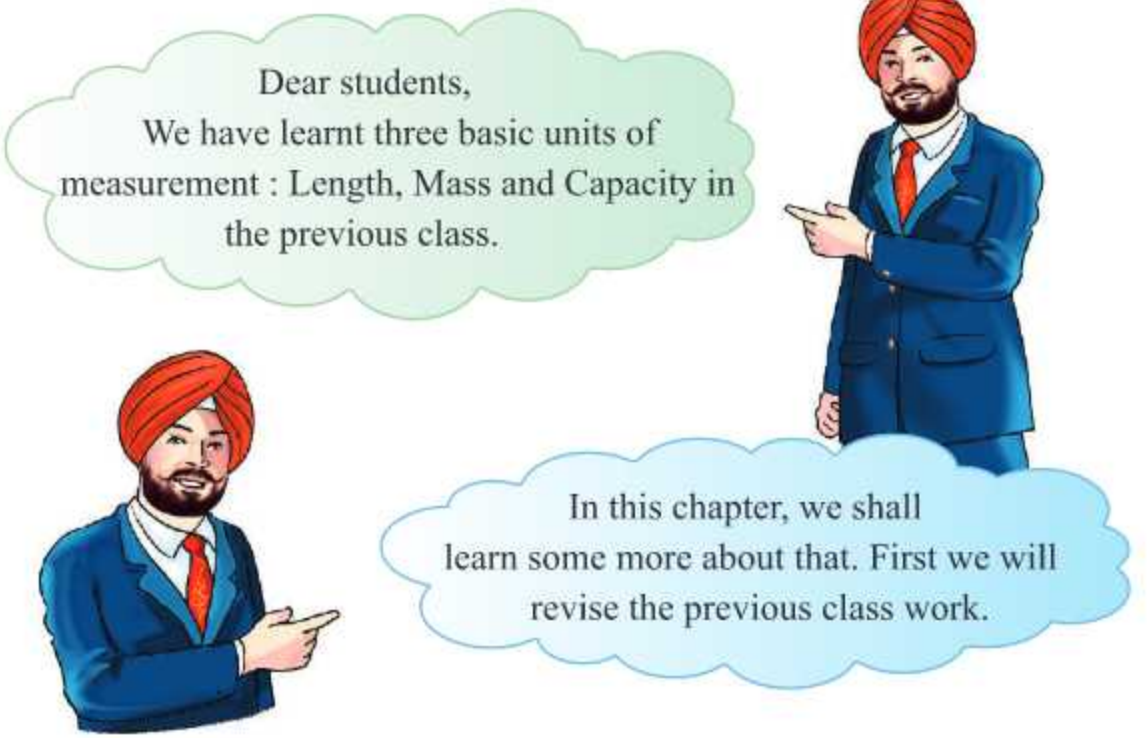
1. *b* **2.** *c* **3.** *a* **4.** *d* **5.** *c* **6.** *b*
7. *c* **8.** *a* **9.** *c* **10.** *a* **11.** *c* **12.** *a*
13. *c* **14.** *b* **15.** *d*

Chapter -6

Measurement

Objectives :

1. To give knowledge about standard units of Length, Mass and Capacity.
2. To make them able to use Length, Mass and Capacity in daily life activities.
3. To develop intellectual faculty of students.
4. To enable them to do four fundamentals operations on length, mass and capacity.
5. To enable them to find time gaps / interval in simple situation.
6. To prepare them for competitive exams.



Recap

1. **How many pieces of 2 m can be cut from a 30 m long rope ? How many times will you cut the rope ?**

2. **Observe the following table and fill ups :**

Centimeters	200		400	500	300	600		800	
Meters	2	6			3		4		9

Kilograms	3			5		2	7	8	4
Grams	3000	6000	4000		8000				

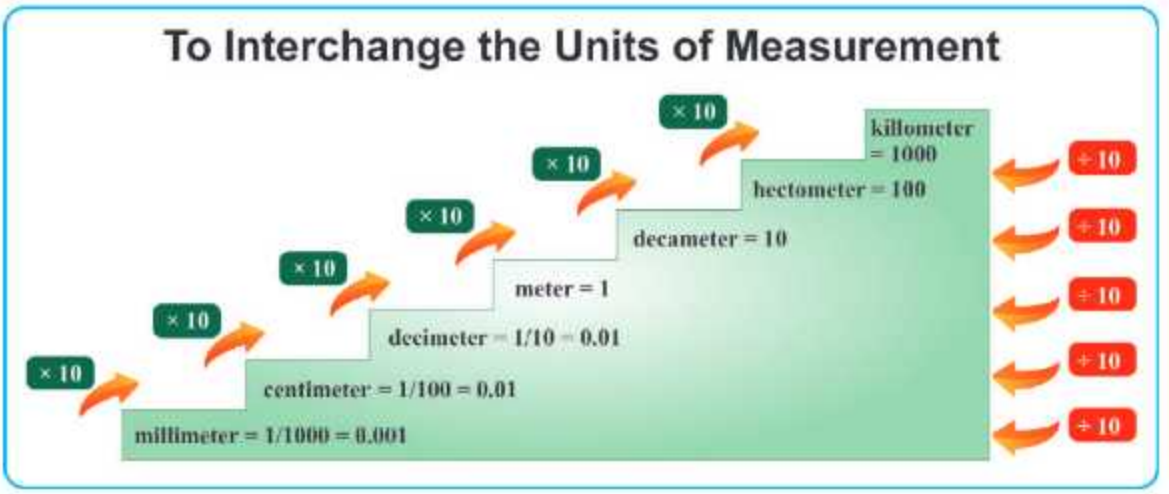
Mililitre	4000			7000			2000		5000
Litre	4	3	14		8	23		9	

6.1 Length :

We have learnt about some standard unit of measurement 'length.' Now we will learn about its all standard units.

kilometer (km)	hectometer (hm)	decameter (dam)	meter (m)	decimeter (dm)	centimeter (cm)	millimeter (mm)
1000	100	10	1	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$

- Look at the following diagram carefully that shows how lengthy units are converted into small units and small units are converted into lenghty units.



Learn this with following wording :

Kal Happy Dakiye Nu Mehngi

Kilometer Hectometer Decameter Meter

Dress Costly Mili

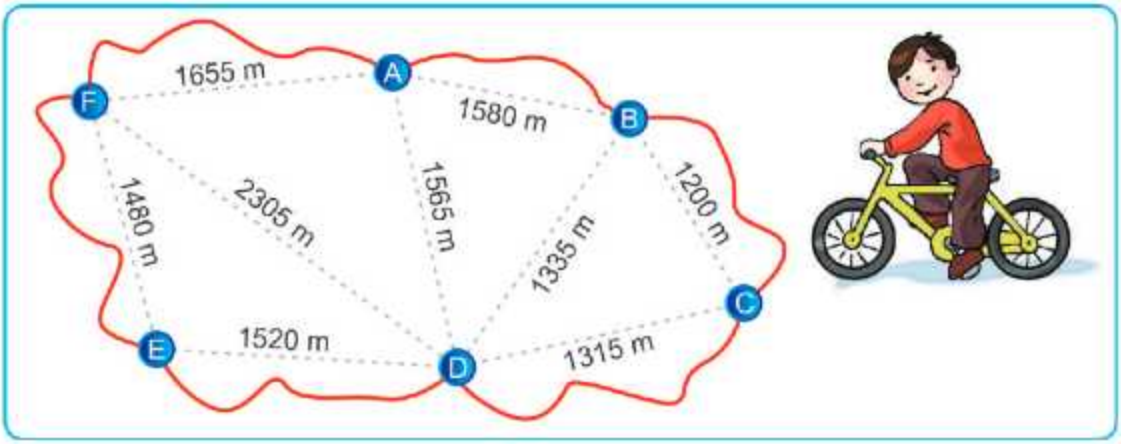
Decimeter Centimeter Milli meter

Maths in daily life.

Activity

There is a far distant village. Its map is as follows :

Raju was cycling in the village.

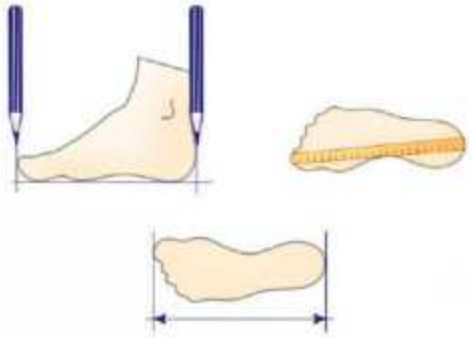


Find the distance covered by Raju :

1. From D to A (passes through B) = ...
2. From B to E (passes through C and D) = ...
3. From A to D (passes through B and C) = ...
4. From A to D (passes through F and E) = ...
5. From B to F (passes through D and E) = ...
6. From C to A (passes through D and F) = ...

Practical Activity

Put your foot on a plain paper and draw an outline with a pencil. Now measure the length of printed foot with a scale and note it down. Now go in a playground. Put your foot one after another and count the number of steps. Measure the distance covered by you. Compare the covered distance with other students.



Length of Manjot's foot = 22 cm

Total steps covered in the playground = 348 steps

So distance covered by Manjot = 348 × 22 ..... cm

= ..... m ..... cm

Example 1 : Write the following in the given measurement :

(a) 6.15 m = ... cm

(b) 4.823 km = ... m

(c) 0.58 da.m = ... cm

(d) 47 mm = ... m

(e) 257 cm = ... h m

Solution : (a) $6.15 \text{ m} = \frac{615}{100} \text{ m}$

$= \frac{615}{100} \times 100 \text{ cm}$ [As 1 m = 100 cm]

$= 615 \text{ cm}$

(b) $4.823 \text{ km} = \frac{4823}{1000} \text{ km}$

$= \frac{4823}{1000} \times 1000 \text{ m}$ [As 1 km = 1000 m]

$= 4823 \text{ m}$

(c) $0.58 \text{ da.m} = \frac{58}{100} \text{ da.m.}$

$= \frac{58}{100} \times 1000 \text{ cm}$ [1 da.m. = 1000 cm]

$= 580 \text{ cm}$

(d) $47 \text{ mm} = \frac{47}{1000} \text{ m}$ [1 mm = $\frac{1}{1000}$ m]

$= 0.047 \text{ m}$

(e) $257 \text{ cm} = \frac{257}{10000} \text{ hm}$ [1 cm = $\frac{1}{10000}$ hm]

$= 0.0257 \text{ hm}$

Exercise-6.1

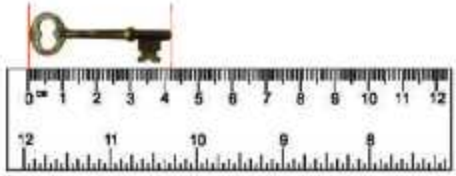
1. Find the length :

8 cm 5 mm = 8.5 cm

(a)

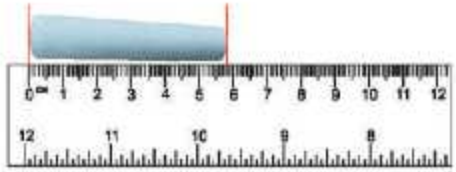
__ cm __ mm = __.__ cm

(b)



__ cm __ mm = __.__ cm

(c)



__ cm __ mm = __.__ cm

(d)

2. Measure the length of line segments in cm and draw on your notebooks.

(a) _____ (b) _____

(c) _____ (d) _____

(e) _____ (f) _____

3. Fill in the blanks :

(a) 3.45 m = ... m ..... cm

(b) 5.75 m = ... m ..... cm

(c) 10.850 km = ... km ..... m

(d) ..... m = 4 m 25 cm

(e) ..... km = 7 km 375 m

4. Convert the following :

(a) 4.5 cm into mm

(b) 270 m into km

(c) 5.82 km into m

(d) 0.65 m into cm

(e) 18 mm into m

6.2 Weight

Daily Life Example : The concept of weight starts with the birth of a baby and ends in grave. Everything is measured in weight i.e., the weight of the baby, weight of school bag, weight of bag, etc.

Example 1 : Harvesting of wheat was going on. Jyoti used to gather straws from fields with her mother every morning, an hour before her school time. Even after her school, she used to collect straws for an hour. In this way, she was able to collect 5 kg wheat each day and her mother could collect 25 kg each day. Explain how much grain (wheat) Jyoti and her mother could gather in a week.

Solution :

In a day, Jyoti collects wheat = 5 kg

In a day, her mother collects wheat = 25 kg

In a day, both collect wheat = 30 kg

In a week, both collected wheat = 30 × 7

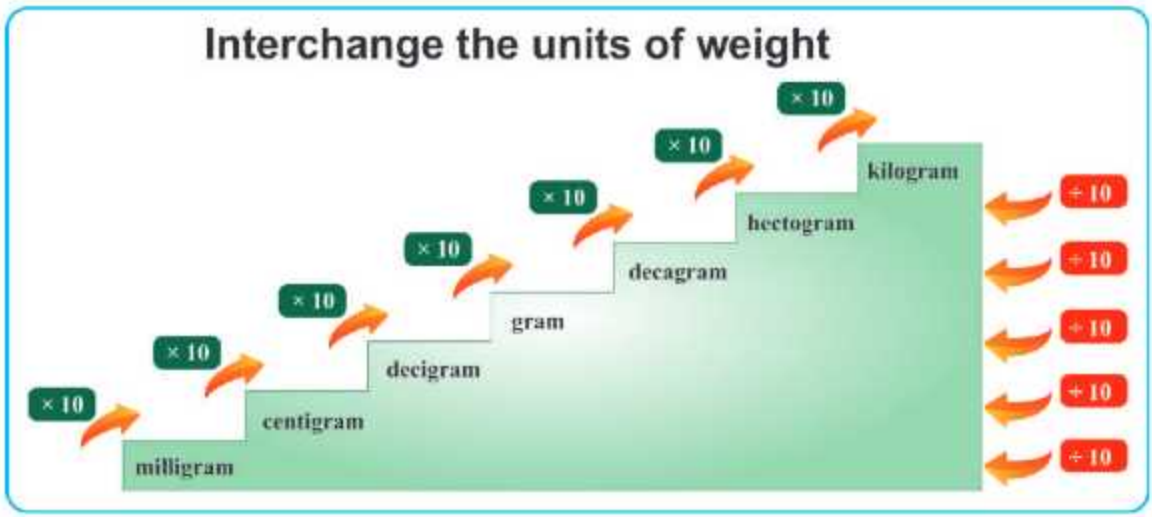
= 210 kg

So, Jyoti and her mother collected 210 kg in a week.

Now we shall discuss about relation between units.

kilogram (kg)	hectogram (hg)	decagram (da g)	gram (g)	decigram (dg)	centigram (cg)	milligram (mg)
1000	100	10	1	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$

- In above table, relation between different units is mentioned.
- In the following table, there is a formula for conversion of larger units into smaller units and smaller units into larger units.



Kal Happy Dakiye Nu Green

kilogram hectogram decagram gram

Dress Costly Mili

decigram centigram milligram

Let us Learn

Example 1 : Fill in the blanks :

(a) 2500 g = ... kg

(b) 4 gm = ... mg

(c) 4 kg = ... g

(d) 3 kg 250 g = ... g

(e) 8590 g = ... kg

Solution : (a) $2500\text{ g} = \frac{2500}{1000}\text{ kg}$ $\left[1\text{ g} = \frac{1}{1000}\text{ kg}\right]$

$= 2.500\text{ kg}$

(b) $4\text{ g} = 4 \times 1000\text{ mg}$ [1 g = 1000 mg]

$= 4000\text{ mg}$

(c) $4\text{ kg} = 4 \times 1000\text{ g}$ [1 kg = 1000 g]

$= 4000\text{ g}$

(d) $3\text{ kg }250\text{ g} = (3 \times 1000 + 250)\text{ g}$

$= (3000 + 250)\text{ g}$

$= 3250\text{ g}$

(e) $8590\text{ g} = \frac{8590}{1000}\text{ kg}$

$= 8.590\text{ kg}$

Exercise-6.2

1. Find the weight :

1 kg. 500 g = 1.500 kg

__ kg ____ g = __.__ kg

kg g = . kg

kg g = . kg

2. Tick (✓) the required weights for the following :

Weight	 1 kg	 500 gm	 200 gm	 100 gm	 50 gm
(*a*) 1.600 kg					
(*b*) 0.850 kg					
(*c*) 1.050 kg					
(*d*) 1.700 kg					
(*e*) 1.250 kg					

3. Fill in the blanks :

(a) 2.850 kg = ... kg ..... g

(b) 15.790 g = ... g ..... mg

(c) ..... kg = 12 kg 625 g

(d) ..... kg = 7 kg 75 g

(e) ..... g = 10 g 800 mg

4. Convert :

(a) 3.275 g into mg

(b) 8050 g into kg

(c) 4.2 kg into g

(d) 865 mg into g

(e) 520 g into kg

6.3 Capacity :

Dear students, the water contained in a glass is the capacity of the glass.

Students, the amount of space in a vessel is the capacity of the vessel.

For eg.
This bucket can hold 20 litres of water. The capacity of this bucket is 20 litres

In the previous classes we have read about the standard units of capacity. Now let us discuss the standard units of capacity in detail and their.

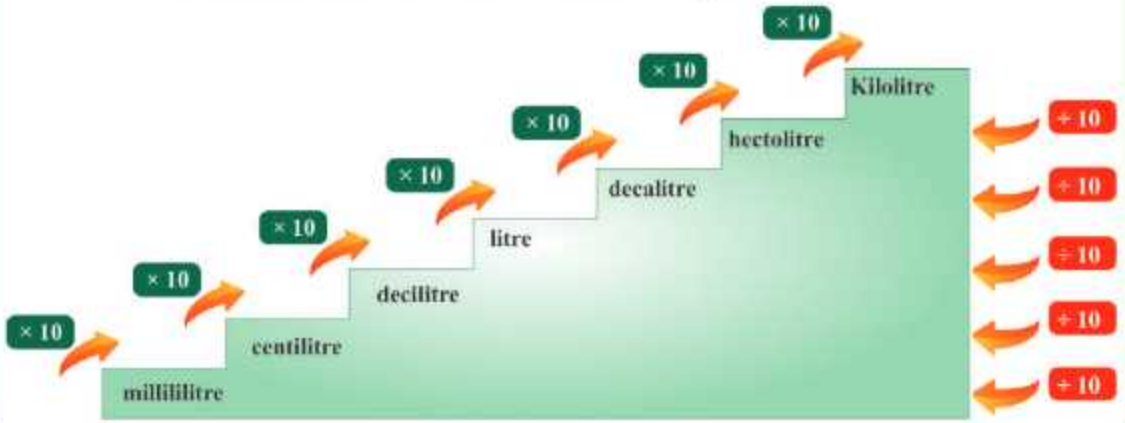
kilolitres (l)	hectolitres (hl)	decalitres (da l)	litre (l)	decilitres (dl)	centilitres (cl)	millilitres (ml)
1000 l	100 l	10 l	1l	$\frac{1}{10}\ l$	$\frac{1}{100}\ l$	$1\frac{1}{1000} l$

The standard unit of capacity is litre.

Look at the following for conversion of larger and smaller units.

To Interchange the different units of capacity covert.

To convert the units of capacity



This can be remembered with the following Rhyme.

Kal Happy Dakiye Nu Lal

kilolitre hectolitre decalitre litre

Dress Costly Mili

decilitre centilitre millilitre

Let us Learn

Example 1 : Fill in the blanks of the following :

(a) 10 ml = ... l

(b) 12 kl = ... l

(c) 5 l 465 ml = ... ml

(d) 8356 dl = ... hl

(e) 5627 l = ... hl

Solution : (a) $10 \text{ ml} = \frac{10}{1000}\ l$ $\quad [1 \text{ m}l = \frac{1}{1000}\ l]$

$= \frac{1}{100}\ l$

(b) $12\ kl = 12 \times 1000\ l$ [1 kl = 1000 l]

$= 12000\ l$

(c) $5\ l\ 465\ ml = [5 \times 1000 + 465]\ ml$ [1 l = 1000 ml]

$= [5000 + 465]\ ml$

$= 5465\ ml$

(d) $8356\ dl = \frac{8356}{1000}\ hl$ [1 $dl = \frac{1}{1000}\ hl$]

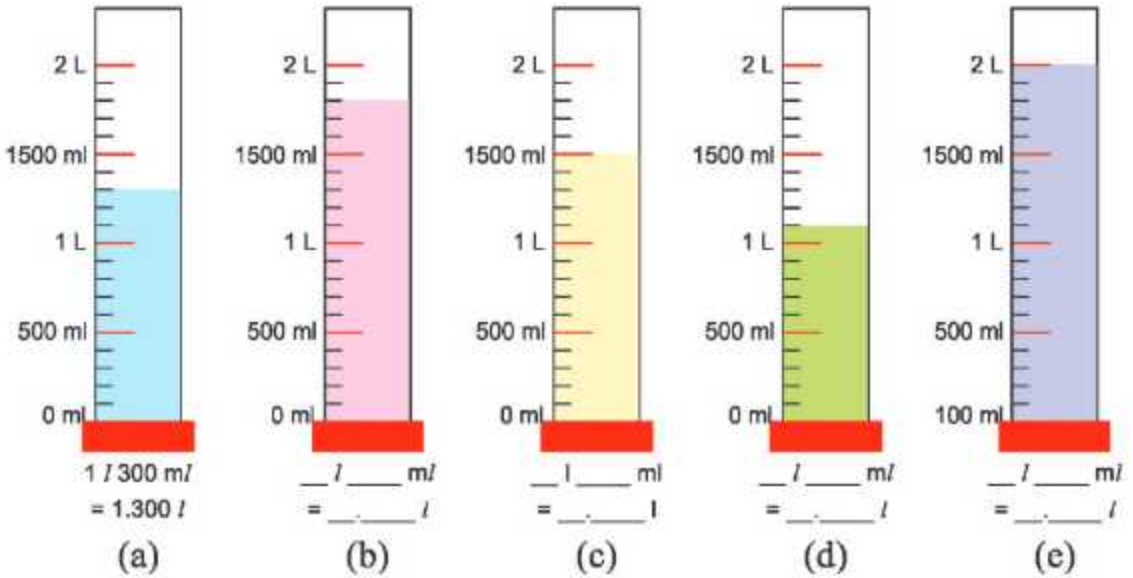
$= 8.356\ hl$

(e) $5267\ l = \frac{5267}{100}\ hl$ [1 $l = \frac{1}{100}\ hl$]

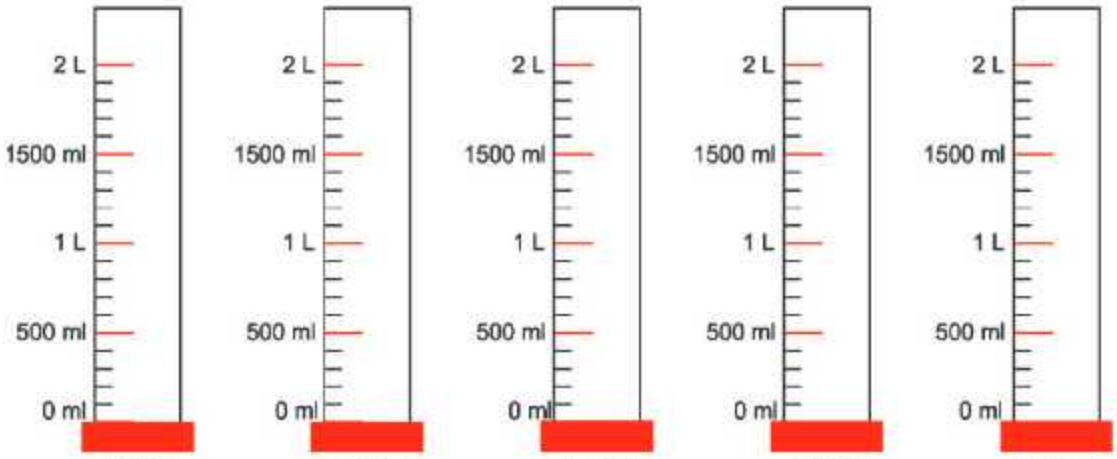
$= 52.67\ hl$

Exercise-6.3

1. Find the amount of liquid in the following :



2. Colour the following scales according to the given quantity.



3. Fill in the blanks :

(a) 3.125 *l* = ... *l* ..... m*l*

(b) 8.720 k*l* = ... k*l* ..... *l*

(c) .... *l* = 4 *l* 948 m*l*

(d) .... k*l* = 15 kl 650 *l*

(e) 18.045 *l* = ... *l* ..... m*l*

4. Convert :

(a) 7.6 *l* into millilitres

(b) 250 m*l* into litres

(c) 4.25 k*l* into litres

(d) 0.845 *l* into millilitres

(e) 92 *l* into kilolitres

6.4 Addition - Subtraction of the Measurements :

We have learnt the conversion of units of length, mass and capacity from one unit to another. Here, we shall discuss about their addition and subtraction.

It should be noted that while addition and subtraction, the unit must be the same like meter with meter, kg with kg, litre with litre etc.

Example 1 : Add

(a) 3 kg 800 g and 7 kg 170 g

(b) 5 km 560 m and 3 km 850 m

(c) 4 k*l* 225 *l* and 5 k*l* 980 *l*

Solution : (a)

$$\begin{array}{r} 3\text{ kg }\ 800\text{ g} \\ +\ 7\text{ kg }\ 170\text{ g} \\ \hline 10\text{ kg }\ 970\text{ g} \end{array}$$

(b)

$$\begin{array}{r} 5\text{ km }\ 560\text{ m} \\ +\ 3\text{ km }\ 850\text{ m} \\ \hline 8\text{ km }\ 1410\text{ m} \end{array}$$

because 1410 m = 1 km 410 m

So, 8 km 1410 m = 9 km 410 m

(c)

$$\begin{array}{r} 4\text{ k}l\ \ 225\ l \\ +\ 5\text{ k}l\ \ 980\ l \\ \hline 9\text{ k}l\ \ 1205\ l \end{array}$$

because 1205 *l* = 1 k*l* 205 *l*

So, 9 k*l* 1205 *l* = 10 k*l* 205 *l*

Example 2 : Subtract :

(a) 3 kg 150 g from 7 kg 200 g

(b) 13 m 400 mm from 17 m 300 mm

(c) 3 *l* 650 m*l* from 4 *l*

Solution : (a)

$$\begin{array}{r} 7\text{ kg }\ 200\text{ g} \\ -\ 3\text{ kg }\ 150\text{ g} \\ \hline 4\text{ kg }\ 050\text{ g} \end{array}$$

(b) We can write 17 m 300 mm into 16 m 1300 mm [As 300 mm < 400 mm]

$$\begin{array}{r} 16\text{ m }\ 1300\text{ mm} \\ -\ 13\text{ m }\ 400\text{ mm} \\ \hline 3\text{ m }\ 900\text{ mm} \end{array}$$

(c) We can write 4 *l* as 3 *l* 1000 m*l*

$$\begin{array}{r} 3\ l\ 1000\ ml \\ -\ 3\ l\ \ 650\ ml \\ \hline 0\ l\ 350\ ml \end{array}$$

Example 3 : Raju bought 3 kg 250 g mangoes and 5 kg 480 g apples. How many kilograms of fruit had he bought ?

Solution :

Raju bought mangoes = 3 kg 250 g

Raju bought apples = 5 kg 480 g

Total fruits bought = 3 kg 250 g

$+$ 5 kg 480 g

8 kg 730 g

Therefore Raju bought 8 kg 730 gms. of fruits.

Example 4 : 45 *l* milk is purchased for a ceremony out of that, 33 *l* 500 m*l* milk is used. How many litres of milk is left ?

Solution : Milk purchased for ceremony = 44 *l* 1000 m*l* [$\because$ 45 *l* = 44 *l* 1000 *ml*]

Milk used in ceremony = 33 *l* 500 m*l*

Milk left = 44 *l* 1000 m*l*

$-$ 33 *l* 500 m*l*

11 *l* 500 m*l*

Therefore 11 litre 500 m*l*. milk is left.

Example 5 : Mohan purchased 1 m 05 cm cloth for pants, 1 m 50 cm for shirt and 2 m 40 cm for Pyjama. Find the total length of cloth bought by Mohan ?

Solution :

Cloth purchased for pants = 1 m 05 cm

Cloth purchased for shirt = 1 m 50 cm

Cloth purchased for pyjama = 2 m 40 cm

Total length of cloth = 1 m 05 cm

$+$ 1 m 50 cm

$=+$ 2 m 40 cm

4 m 95 cm

Therefore, cloth purchased by Mohan is 4 m 95 cm.

Exercise-6.4

1. **Add the following :**
   (a) 7 km 750 m and 2 km 575 m
   (b) 4 kg 500 g and 9 kg 825 g
   (c) 5 *l* 925 m*l* and 7 *l* 650 m*l*
   (d) 10 m, 3 m 85 cm and 6 m 25 cm
   (e) 8 kg 700 g, 975 g and 2 kg 350 g
2. **Subtract :**
   (a) 7 km 625 m from 12 km 300 m
   (b) 3 kg 650 g from 8 kg
   (c) 5 *l* 850 ml from 10 *l* 350 m*l*
   (d) 9 m 60 cm from 15 m
   (e) 13 *l* from 25 *l* 765 m*l*
3. Anand has bought 2 kg 350 g onions. 1 kg 750 g potatoes. How many kilograms of vegetables has he bought ?
4. Ajay has travelled 150 km 400 m distance by bus, 120 km 650 m by taxi. How much distance has he covered ?
5. Three containers contained 10 *l* 350 m*l*, 9 *l* 850 ml and 11 *l* oil respectively. Find the total quantity of oil contained in three containers.
6. Anita bought 7 m 30 cm cloth. She used 2 m 50 cm cloth for her suit. Find the remaining length of the cloth.
7. A family consumes 10 kg 750 g wheat and 4 kg 500 g rice in a month. Find the difference of consumption of rice and wheat.

Value Based Question : Jasmeet is going to meet her maternal grand father and grandmother who lived far away. She covered the distance of 18 km 425 m by bus and then 4 km 215 m by auto rickshaw. How far is Jasmeet's maternal grand father and grand mothers house from her house ?

Multiplication /Division of Measurements

Students, you have learnt addition and subtraction of units of measurements. Now you will learn multiplication and division of units of measurements.

Example 1 : Ram has bought 3 m cloth for his shirt. The shopkeeper gives the cloth at a price of ₹ 152.50 per meter. How much does Ram pay for it.

Solution : Price of 1 meter cloth = ₹ 152.5

Price of 3 meter cloth = ₹ 152.5 × 3

= ₹ 457.50

152.5
× 3
457.5

Example 2 : The weight of 1 box of apples is 16.80 kg. Find the weight of 12 such boxes.

Solution : Weight of 1 box of apples = 16.80 kg

Weight of 12 boxes of apples = 16.80 × 12

= 201.60 kg

Weight of 12 boxes = 201.60 kg

1680
× 12
3360
16800
20160

Example 3 : A vessel contains 22.75 *l* milk. How many litres of milk is contained in 8 such vessels.

Solution : Quantity of milk in 1 vessel = 22.75 *l*

Quantity of milk in 8 vessels = 22.75 × 8

=18.200 *l*

2275
× 8
18200

Example 4 : A rope of length 18.3 m is divided into 3 equal parts. Find the length of each part.

Solution : Total length of rope = 18.3 m

Length of each part = 18.3 ÷ 3

= 6.1 m

6.1
3) 18.3 (
– 18
0 3
– 3
×

Example 5 : There are 46.5 kg rice in a bag. A shopkeeper wants to make 5 packets from this. How much rice will be there in each packet ?

Solution :

Quantity of rice in bag = 46.5 kg

Total number of packets = 5

So, quantity of rice in 1 packet = 46.5 ÷ 5

= 9.3 kg

$$\begin{array}{r} 9.3 \\ 5\overline{)\,46.5\,(} \\ -45 \\ \hline 1.5 \\ -1.5 \\ \hline \times \end{array}$$

Exercise-6.5

1. The cost of 1 m cloth for pants is ₹ 265.50 and there is 24 m cloth in a roll. Find the cost of one bundle.
2. The weight of a box of mangoes is 32.4 kg. A shopkeeper wants to make 6 packets from this. How many kilograms of mangoes will be there in each packet ?
3. A vessel contains 28.5 *l* oil. It is poured into 5 small containers. How much oil will be there in one small container ?
4. 1 bundle of copies weighs 9.8 kgs. Find the weight of 14 such bundles.
5. The length of a stick is 12.7 cm. Find the length of 7 such sticks.

6.6 Time

Activity

We often use the word 'time' in our daily life. We already know the different units of time as year, week, day, hour, minute etc. In 4th class, we used minute as the smallest unit of time. In this class, we shall discuss another smallest unit of time.

If the time interval of 1 minute is divided into 60 equal parts then each part is called 'second'. So the relation between different time intervals is as follows :

1 year	=	12 months = 365 or 366 days (leap year)
1 month	=	28 or 29 or 30 or 31 days
1 week	=	7 days
1 day	=	24 hours
1 hour	=	60 minutes
1 minute	=	60 seconds

6.6.1. 24 Hour Clock :

In our daily life, we use 12 hour clock and for this, we use a.m. for morning and p.m. for evening, noon or midnight etc. But in some departments like Railway, Air Services etc. make use of 24 hrs clock. The Relation between 12 hour and 24 hour clock time is as follows :

12 hour clock time	**24 hour clock time**
12 midnight	00.00 or 24.00 hours
1 a.m. morning	01 : 00 hours
2 a.m. morning	02 : 00 hours
3 a.m. morning	03 : 00 hours
.....	.....
.....	.....
10 a.m. morning	10 : 00 hours
11 a.m. morning	11 : 00 hours
12 a.m. morning	12 : 00 hours
1 p.m. afternoon	13 : 00 hours
2 p.m. afternoon	14 : 00 hours

.....	.....
.....	.....
10 pm night	22 : 00 hours
11pm night	23 : 00 hours
12 midnight	00 : 00 hours or 24 : 00 hours

Example 1 : Convert the following into 24-hour clock time.

(a) 3 : 30 a.m. (b) 6 : 30 a.m.

(c) 11 : 20 p.m. (d) 10 : 10 a.m.

Solution : (a) 3 : 30 a.m. = 03 : 30 hours

(b) 6 : 30 a.m. = 18 : 30 hours

(c) 11 : 20 p.m. = 23 : 20 hours

(d) 10 : 10 a.m. = 10 : 10 hours

Example 2 : Convert the following into 12 hour clock

(a) 24 : 00 or 00 : 00 hours (b) 13 : 50 hours

(c) 20 : 00 hours (d) 08 : 40 hours

Solution : (a) 24 : 00 or 00 : 00 hours = 12 midnight

(b) 13 : 50 hours = 1 : 50 p.m.

(c) 20 : 00 hours = 8.00 p.m.

(d) 08 : 40 hours = 8 : 40 a.m.

6.6.2 Addition of Time

Addition of time is very easy. We add seconds in seconds, minutes in minutes and hours in hours. If the sum of seconds or minutes is more than 60 then we convert them into minutes and hours.

Example 3 : Add the following :

(a) 2 hours 30 min 15 sec and 4 hours 10 min 30 sec

(b) 3 hours 40 min 30 sec and 4 hours 30 min 40 sec

Solution : (a)

$$\begin{array}{r} 2 \text{ hours } 30 \text{ min } 15 \text{ sec} \\ +\ 4 \text{ hours } 10 \text{ min } 30 \text{ sec} \\ \hline 6 \text{ hours } 40 \text{ min } 45 \text{ sec} \end{array}$$

(b) 3 hours 40 min 30 sec

+ 4 hours 30 min 40 sec

7 hours 70 min 70 sec

Now 70 seconds = 1 min. 10 sec and 71 minutes. = 1 hour 11 min

So 7 hours 70 min 70 sec = 8 hours 11 min 10 sec.

Example 4 : Add the following :

(a) 6 years 5 months and 3 years 2 months

(b) 5 years 8 months and 6 years 5 months

Solution : (a) 6 years 5 months

+ 3 years 2 months

9 years 7 months

(b) 5 years 8 months

+ 6 years 5 months

11 years 13 months = 12 years 1 month

(As 13 months = 1 year 1 month)

Exercise-6.6

1. Addition :

(a) 2 hours 10 min and 1 hour 20 min.

(b) 4 hours 35 min and 3 hours 40 min.

2. Add the following :

(a) 1 hour 10 min 20 sec and 3 hours 20 min

(b) 2 hours 50 min 30 sec and 1 hour 10 min 30 sec

3. Add :

(a) 7 months and 2 years 3 months

(b) 4 years 5 months and 1 year 8 months

6.6. 3 Subtraction of Time :

We subtract seconds from seconds, minutes from minutes and hours from hours. If number of minutes or seconds is more while subtracting then we use the relation 1 hour = 60 minutes and 1 minute = 60 seconds.

Example 5 : Find the difference :

(a) 4 hours 28 min 30 sec and 2 hours 12 min 10 sec

(b) 5 hours 30 min 10 sec and 1 hour 40 min 30 sec

Solution : (a) 4 hours 28 min 30 seconds

– 2 hours 12 min 10 seconds

2 hours 16 min 20 seconds

(b) We know that 1 hr = 60 min and 1 min = 60 seconds.

5 hours 30 min 10 secones = 4 hours 89 min 70 sec.

–1 hour 40 min 30 seconds = – 1 hour 40 min 30 sec.

3 hour 49 min 40 sec.

[As 30 min = 29 min 60 sec and 5 hours = 4 hours 60 min]

Example 6 : Subtract :

(a) 2 years 5 months from 7 years 9 months

(b) 3 years 8 months from 6 years 3 months

Solution : (a) 7 years 9 months

– 2 years 5 months

5 years 4 months

(b) As 1 year = 12 months

So, 6 years 3 months = 5 years 15 months

5 years 15 months

– 3 years 8 months

2 years 7 months

Example 7: Ramesh leaves for his office at 8:20 a.m. from his home and reaches the office at 9 : 00 a.m. In how much time does he reach the office ?

Solution : We can get this time by subtraction

Now 9 : 00 a.m = 8 hours 60 minutes

So, the time taken to reach office

$$\begin{array}{r} 8 \text{ hours } 60 \text{ min} \\ -\ 8 \text{ hours } 20 \text{ min} \\ \hline 40 \text{ min} \end{array}$$

Example 8: Find the time interval between 10 : 30 pm. to 1 : 30 am next day ?

Solution : We know in 24 hour clock time, 10 : 30 pm = 22 : 30 and 12 midnight = 24 : 00

So time interval between 10 : 30 pm and midnight

$$\begin{array}{rl} 23 \text{ hours } 60 \text{ min} & [\text{As } 24 \text{ hours} = 23 \text{ hours } 60 \text{ min}] \\ -\ 22 \text{ hours } 30 \text{ min} & \\ \hline 1 \text{ hour } 30 \text{ min} & \end{array}$$

Now time interval between mid night and 1:30 am = 1 hour 30 min.

So, total time gap

$$\begin{array}{r} 1 \text{ hour } 30 \text{ min} \\ +\ 1 \text{ hour } 30 \text{ min} \\ \hline 2 \text{ hours } 60 \text{ min} \end{array}$$

So required time Interval = 2 hr 60 min = 3 hrs

Example 9 : A bus leaves from Chandigarh at 8:30 a.m. and reaches Delhi at 1:30 p.m. How much time does it take to reach Delhi ?

Solution : To find out the time taken, change 12 hour clock into 24 hour clock time.

$$\begin{array}{rrr} 8 : 30 \text{ am} & = & 08 : 30 \\ \text{and } 1 : 30 \text{ pm} & = & 13 : 30 \\ \text{So time taken} & = & 13 : 30 \\ & = & -\ 08 : 30 \\ & = & 05 : 00 \end{array}$$

So, the bus takes 5 hours to reach Delhi.

Example 10 : A school closes for summer vacation on 21st May and opens on July 5. Find out the number of days for which the school was closed.

Solution : Number of days from 21st May to 31st May = 11 days

(31 – 20 = 11)

Number of days in June = 30 days

Number of days in July = 04 days

Total days = 11 + 30 + 4

= 45 days

So school is closed for 45 days.

Example 11 : A train, Karnatka Express, runs from Delhi on Tuesday at 6 a.m. and reaches Bangalore on Wednesday at 9 : 00 pm. How much time is taken by the train ?

Solution : Time from Tuesday 6 am to Wednesday 6 a.m. = 24 hours

Wednesday 6 am to 9 pm = 15 hours

So total time = 24 + 15 = 39 hours

Or 1 day 15 hours

Exercise-6.7

1. **Find the difference :**
   (a) 8 hours 30 min and 2 hours 10 min
   (b) 10 hours 30 min 20 sec and 8 hours 20 min 15 sec
   (c) 11 years 5 months and 6 years 2 months
   (d) 7 years 2 months and 3 years 6 months
2. **Find the Time :**
   (a) 4 hours before 5 : 30 pm
   (b) 2 hours after 11 : 00 am
   (c) 6 hours before 4 : 30 am
   (d) 1 hour 45 min after 8 : 30 am

3. **Find the Time Gap :**

(a) From 3 : 00 a.m. to 10 : 00 a.m.

(b) From 6 : 00 a.m. to 1 : 30 p.m.

(c) From 5 : 00 p.m. to 10 : 45 p.m.

(d) From 9 : 00 p.m. to 2 : 30 a.m. (next morning)

4. A bank opens at 9:30 a.m. and closes at 5:00 p.m. How many working hours are there ?

5. A bus starts from Chandigarh at 7:30 am and reaches Shimla at 10:50 am. How much time is taken by the bus to reach Shimla ?

6. A boy goes to school at 7:30 am and returns back from school at 2:45 pm. How much time does he spend in the school ?

Multiple Choice Questions (MCQs)

Tick (✓) the right answer

1. Convert 8 m into centimeters.

(a) 80 cm (b) 800 cm (c) 8000 cm (d) 80 cm

2. Convert 16 k*l* into litres.

(a) 160 *l* (b) 1600 *l* (c) 16000 *l* (d)160000 *l*

3. Convert 10 dag into grams.

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

4. How many kgs are there in 1000 g ?

(a) 100 kg (b) 10 kg (c) 20 kg (d) 1 kg

5. Decimal formation of 3 *l* 175 m*l*

(a) 31.75 *l* (b) 317.5 *l* (c) 3.175 *l* (d) 0.3175 *l*

6. 3.5 km = ... m

(a) 350 m (b) 3500 m (c) 35 m (d) 0.350 m

7. Which unit is used by a shopkeeper to weigh vegetables ?

(a) litre and k*l* (b) meter and km

(c) gram and kg (d) none

8. Which measurement is used to measure liquids ?

(a) litre (b) kg

(c) meter (d) none

9. Kanwal bought 6 kg potatoes, 3 kg 500 g onions and 500 g tomatoes from the market. How many kgs of vegetables had he bought ?

(a) 10 kg (b) 6 kg (c) 3 kg (d) 11 kg

10. Harpreet has bought 10 m cloth, he uses 6 m 50 cm cloth for her suit. How much cloth is left ?

(a) 2 m 50 cm (b) 4 m

(c) 4 m 50 cm (d) 3 m 50 cm

11. How many millimeter are in one meter ?

(a) $\frac{1}{100}$ (b) $\frac{1}{1000}$

(c) $\frac{1}{10}$ (d) 100

12. How many centimeters are in one hectometer ?

(a) 1000 (b) 10000

(c) 100 (d) $\frac{1}{1000}$

13. How many hectogram are in one kilogram ?

(a) 100 (b) $\frac{1}{100}$

(c) 10 (d) $\frac{1}{10}$

14. How many decalitres are in one kilolitre ?

(a) 1000 (b) 500

(c) 200 (d) 100

15. How many millilitres are in one deciletre ?

(a) 10 (b) 10000

(c) 100 (d) 1000

16. How many days are there in a leap year ?

(a) 364 (b) 366

(c) 365 (d) 363

17. How many days are there in February in a Leap year ?

(a) 28 (b) 30

(c) 29 (d) 31

18. Write 3.10 p.m. according to 24 hour clock ?

(a) 23:10 (b) 25:10

(c) 15:10 (d) 13:10

19. Write 22:25 according to 12 hour clock.

(a) 10:25 p.m. (b) 12:25 a.m.

(c) 12:25 p.m. (d) 9.25 p.m.

20. How many seconds make one hour ?

(a) 60 (b) 3600

(c) 360 (d) 300

Learning Outcomes

- To know about the relationship of the units of Length, Weight and Capacity and their usage in day to day life.
- To be capable of Fundamental operations of Length, Weight and Capacity
- To be capable of knowing about Time Duration.
- To prepare for competitive exams

Answers

Exercise 6.1

3. (a) 3 m 45 cm (b) 5 m 75 cm

(c) 10 km 850 m (d) 4.25 m

(e) 7.375 km

4. (a) 45 mm
(b) 0.270 km
(c) 5820 m
(d) 65 cm
(e) .018 m

Exercise 6.2

3. (a) 2 kg 850 g
(b) 15 g 790 mg
(c) 12.625 kg
(d) 7.075 kg
(e) 10.800 kg

4. (a) 3275 mg
(b) 8.050 kg
(c) 4200 g
(d) .865 g
(e) .520 kg

Exercise 6.3

3. (a) 3 *l* 125 m*l*
(b) 8 kl 720 *l*
(c) 4.948 *l*
(d) 15.650 k*l*
(e) 18 *l* 045 m*l*

4. (a) 7600 *l*
(b) .250 m*l*
(c) 4250 *l*
(d) 845 m*l*
(e) .092 k*l*

Exercise 6.4

1. (a) 10 km 325 m
(b) 14 kg 325 g
(c) 13 *l* 575 m*l*
(d) 20 m 10 cm
(e) 12 kg 25 g

2. (a) 4 km 675 m
(b) 4 kg 350 g
(c) 4 *l* 500 m*l*
(d) 5 m 40 cm
(e) 12 *l* 765 m*l*

3. 4 kg 100 g
4. 271 km 50 m
5. 31 *l* 200 m*l*
6. 4 m 80 cm
7. 6 kg 250 g

Exercise 6.5

1. 6372 m **2.** 5.4 kg

3. 5.7 *l* **4.** 137.2 kg

5. 88.9 m

Exercise 6.6

1. (a) 3 hours 30 min (b) 8 hours 15 min

2. (a) 4 hours 30 min 20 sec (b) 4 hours 1 min

3. (a) 2 years 10 month (b) 6 years 1 month

Exercise 6.7

1. (a) 6 hours 20 min (b) 2 hours 10 min 5 sec

(c) 5 years 3 months (d) 3 years 8 months

2. (a) 1 : 30 pm (b) 1 : 00 pm

(c) 10 : 30 pm (d) 10 : 15 am

3. (a) 7 hours (b) 7 hours 30 min

(c) 5 hours 45 min (d) 5 hours 30 min

4. (a) 7 hours 30 min

5. 3 hours 20 min **6.** 7 hours 15 min

Answer of MCQ

1. b	**2.** c	**3.** a	**4.** d
5. c	**6.** b	**7.** c	**8.** a
9. a	**10.** d	**11.** b	**12.** b
13. c	**14.** d	**15.** c	**16.** b
17. c	**18.** c	**19.** a	**20.** b

Chapter-7

Geometry

Objectives :

1. Students will be able to differentiate between 2-D and 3-D shapes.
2. Will develop the understanding of the concept of angles in daily life.
4. Will be able to understand Right angle, Acute angle and Obtuse angle.
5. Will be able to understand symmetry of 2-D and 3-D shapes.

We have studied about straight and curve lines, sides and edges. In this chapter, we will study about point, line segment, ray, angle, right angle, 2-D and 3-D shapes.

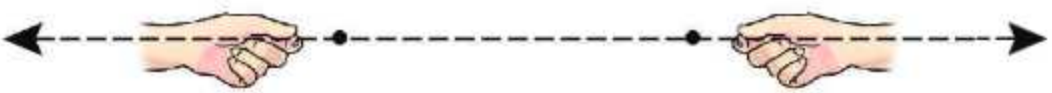
7.1 Point, Line, Line Segment and Ray :

Point – Point is represented as (.). We can represent it with the tip of a pencil. We can name them with letters of English alphabet like A, B, C etc.

A• B•

C•

Line – When a thread (or rope) is held between any two points A and B and is stretched endlessly in both directions then it forms a line.



A straight line neither has breadth nor has thickness. It goes endlessly in two opposite directions. We cannot show a line as a whole but we can represent it as a figure.

Line AB

Line l

Double arrows in the line AB shows that it can be extended infinitely in both directions. It has no end points.

Line Segment — If we take a part of the line then arrows are not marked, this finite part of line is called line segment. It has two end points.

Line Segment AB

Ray — In our daily life, we use word 'sun's rays. These rays comes from sun directly to the earth. Here a ray is a fixed track/path which has one end fixed and another end goes infinitely as shown in the figure :

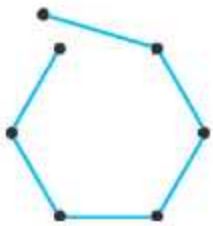
Ray AB

A ray has no fixed length. Its name is written by taking two alphabets together. To represent a ray, starting point is named first and second point can be taken anywhere on ray.

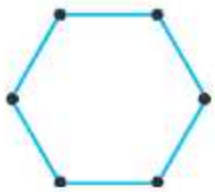
Note :
- Ray AB is different from BA.
- It has only one end point.

Activity

Manjeet and Ranjit are two friends. They enjoy playing together. One day they were making shapes with match sticks. They made different shapes with 6 match sticks without looking at one another's pictures.

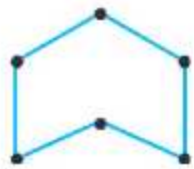


(a)



(b)

(c)



(d)

After looking at their shapes, Manjeet's elder sister Daljeet asks her "Which shapes are open or closed ?" "Can you also tell that how these closed figures are different from each other ?" [All are closed except fig (a)]

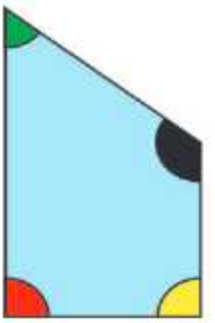
After getting no reply, Daljeet asks them to make any figure with two match sticks. They make the following figures.

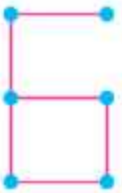
Now Daljeet tells that the figures which you have made, have different angles. Manjeet and Ranjit ask her "Sister, what is an angle?" Daljeet explains that the point where both match sticks join together, an angle is formed.

Manjeet, "Ok Sister, that is why our closed figures were different because their angles were different."

- When two rays or line segments meet at a common point, it forms an angle. Common point is the vertex and both rays or line segments are called arms.

1. In the figure, angle of which colour is the smallest ?
2. Angles of which colours are equal ?
3. Make the closed figure with 4 match sticks by changing their angles.
4. With the help of 6 match sticks a figure of 6 is made. Now make this number as 9 by changing the position of 1 matchstick.

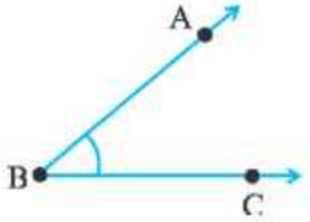


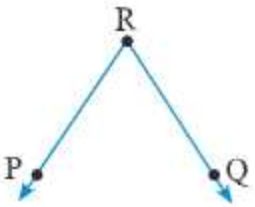


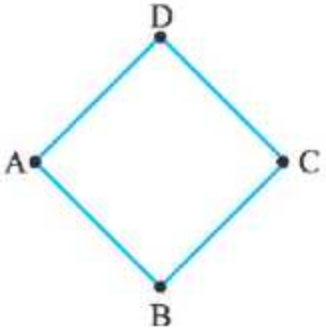
7.2 Naming of Angles

An angle can also be named by letters of English alphabet like other shapes. For example : The angle can be read as ABC and written as ∠ABC or ∠CBA (common vertex B is written in middle). So it can also be written as ∠B. Now take two match sticks and put in such a way that their edges meet at

one end. Now take one more pair of sticks and join the open ends of first pair. In this way, a closed figure is formed. Can you write the name of its different angles ?





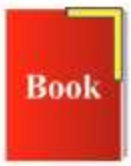


7.3 (Divider)

Activity

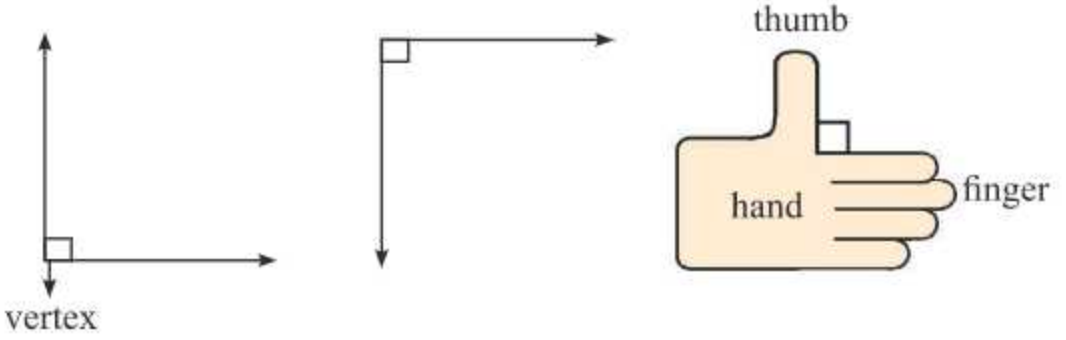
Teacher will ask the students to bring two sticks of ice cream. Fix their ends with the help of drawing pin in such way that they can revolve very easily. Now students will measure the different angles of different objects around them with the help of this instrument ?

Do you have such instrument in your geometry box ? Measure the angle of edge of table and Math book and observe the divider. It opens like English alphabet 'L'.



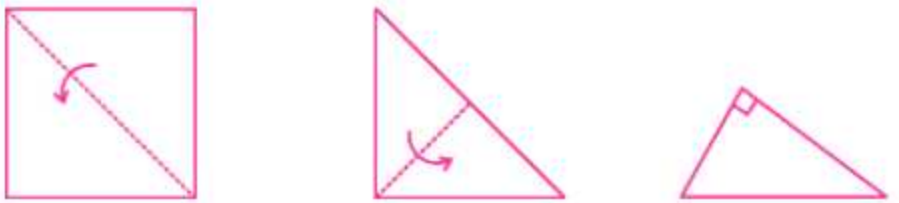
This is a right angle,
we write L for this.

That angle which looks like corners of book, rectangular door is called Right Angle. Its measure is always 90°.



Activity

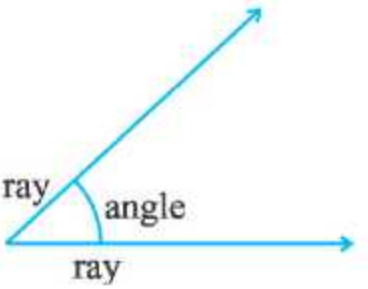
Take a square piece of paper and fold according to the given pictures.



We can measure/identify any right angle with the help of a protractor given in geometry box.

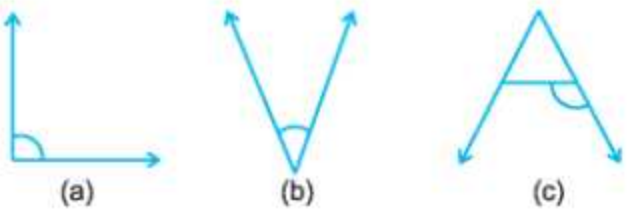
7.4 Angle and its types

Rotation of a ray along a point is calld an angle. In easy words, common vertex between two rays forms an angle. Standard measurement of an angle is degree.



There are 7 types of angles : Zero angle, Acute angle, Right angle, Obtuse angle, Straight angle, Reflex angle, Complete angle. In this chapter, we will study only Acute angle, Right angle and Obtuse angle.

Teacher will write some English alphabets on the board and will ask students to identify them.



Which angle is of 90°, which angle is smaller than 90° and which angle is more than 90°.

Right Angle — An angle which has measurement of 90° is called Right Angle. Its symbol is ⌞ , as shown in figure (a) English alphabet L.

Acute Angle — An angle in figure (b) which is greater than 0° and smaller than 90° is called Acute Angle.

Obtuse Angle — An angle in figure (c) which is greater than 90° but smaller than 180° is called Obtuse Angle.

Activity

(A) Keep 10 books of Maths in a pile and one book in a slanting position as shown in the fig.

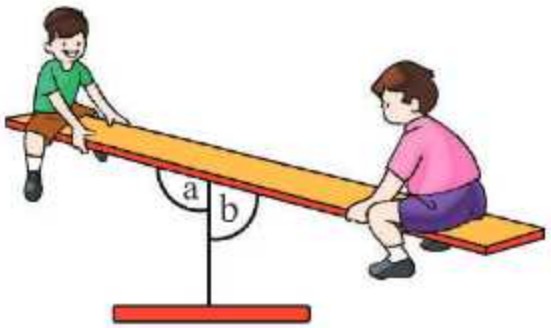
(B) Now do this by using 6 books. Take one ball and roll it from top to bottom.

- On which slide, ball will roll fast ?
- Which slide has smaller angle ?

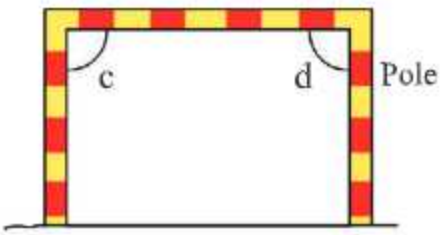
Activity

Angle in a Playground.

Students, identify the different angles in the playground.



Identify ∠a and ∠b



Identify ∠c and ∠d

Activity

Changing shapes

- Students, collect some match sticks and rubber of the valves of cycle tube.
- Remove the black part of the match sticks
- Make triangle with the help of three match sticks and values of the cycle tube
- With these sticks and pieces, make figure of 4, 5 and 6 sides.

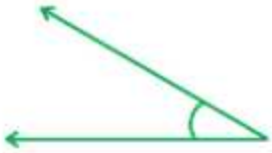
Find, How many angles are there in each figure and mark them.

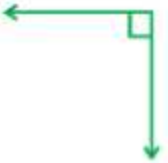
Now push each figure downwards with your finger. Is there any change in figure's angle ? Find out and write your answers in the following table.

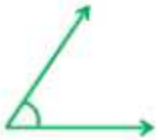
Figure	Change in Angle (Yes/No)
	
	
	
	

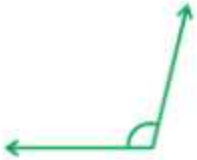
- You can conclude from the changing figures that why triangles are used in towers/bridges ?
- Look out in your surrounding and find some places where triangles are used.

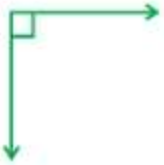
Example 1 : Out of following, which angles are acute angle, right angle or obtuse angle ?

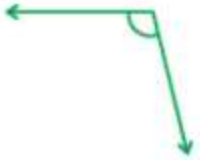
(a) 

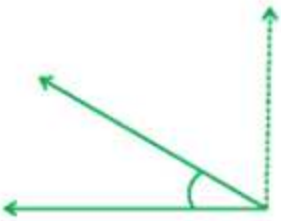
(b) 

(c) 

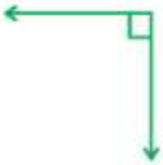
(d) 

(e) 

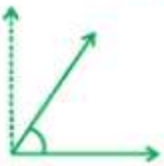
(f) 

Solution : (a) 

First of all, draw estimated straight dotted line for right angle. This angle is interior to right angle so it is an acute angle.

(b) 

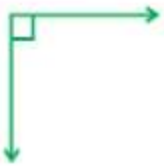
This is a right angle.

(c) 

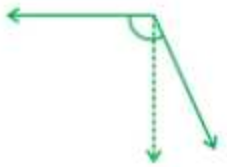
This angle is interior to right angle, so it is an acute angle.

(d) 

This angle is an exterior to right angle, so it is an obtuse angle.

(e) 

This is a right angle.

(f) 

This angle is exterior to right angle, so it is an obtuse angle.

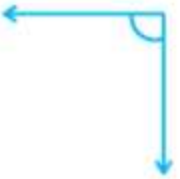
Exercise 7.1

1. Identify the acute angle, right angle and obtuse angle in the following :

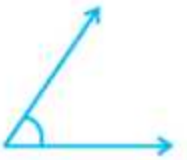
(a) 

(b) 

(c) 

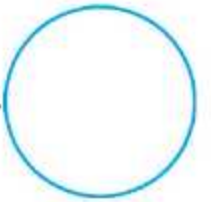
(d) 

(e) 

(f) 

Activity

Let us make a Degree Clock.

1. Take a piece of paper and cut it in the shape of a circle. 

2. Fold it into half. 

3. Then fold it into one-fourth. 

4. Again fold it one more time.

5. Open the page. You will see lines like this.

6. Write 0°, 45°, 90° and 180° as shown in picture.

7. Paste it on a cardboard.

8. Draw a mark from centre.

9. Draw a red mark with thick paper and fix it in this way so that it can be rotated.
Your degree clock is ready.

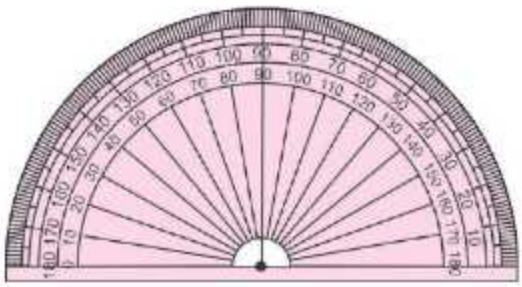
- **Measure the right angle with your degree clock. Measurement of right angle is ..... .**
- Can you tell the degree of the following angles ?
  - Half of right angle .....
  - One-third of right angle .....
  - Double of right angle .....

The angle of 90° is called a right angle.

Activity

PROTRACTOR

Teacher will show protractor (D) to the students and ask about it. Some students will reply that it is 'D'. It might be possible that some students can name it as protractor. Now the teacher will start his discussion.



Students, this is the instrument which is used in Maths. We call it Protractor.

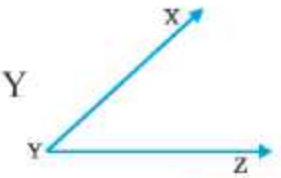
We have discussed about acute and obtuse angles by estimation but now we will measure the angles in degree then tell surely whether it is acute or obtuse.

Features of Protractor :

- A Protractor looks like English alphabet 'D'. So it is also called 'D'.
- It has two scales. 1. Internal Scale 2. External Scale
- In internal scale 0, 10, 20 ....., 180 is written from left to right (clockwise)
- In External scale 180, 170, ... 10, 0 is written from left to right. (clock wise)
- Line which joins 0° to 180° is called Base line.
- Centre point is called centre of protractor.

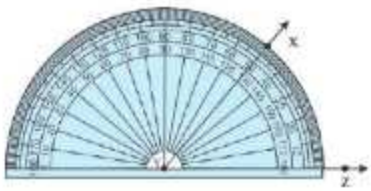
7.5 Measurement of angles.

Students, now we will learn how to measure ∠XYZ



1. Place the centre point of the protractor on the vertex Y of the angle.

Adjust the protractor in such a way that the base line coincides with arm YZ of the angle.

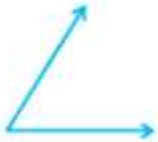


2. Check the scale where the baseline lies on the points on 0°.
3. Read the measure of the angle where the other arm YX crosses the external scale.

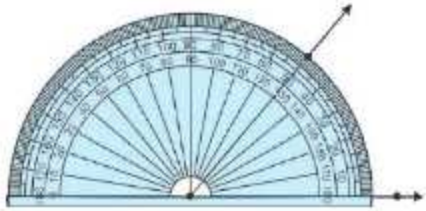
Here XY crosses at 50°. So $\angle XYZ = 50°$.

Note Always see that scale, whose arm coincides with baseline at 0°

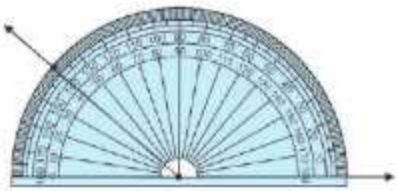
Example 1 : Measure the following angle with the protractor.

(a) 

(b) 

Solution : (a) 

This is 50°. Check carefully it is not 130° because it is interior to right angle.

(b) 

This is 140° not of 40°. As it is exterior to right angle.

Example 2 : Find the acute and obtuse angles from the following :

(a) 48° (b) 118° (c) 125° (d) 65°

(e) 79°

Solution : (a) 48° This angle is lying in between 0° and 90°. So it is an acute angle.

(b) 118° This angle is lying in between 90° and 180°. So this is an obtuse angle.

(c) 125° This angle is lying in between 90° and 180°. So this is an obtuse angle.

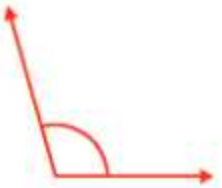
(d) 65° This angle is lying in between 0° and 90°. So this is an acute angle.

(e) 79° This angle is lying in between 0° and 90°. So this is an acute angle.

Exercise 7.2

1. Measure the following angles using protractor :

(a)  ☐

(b)  ☐

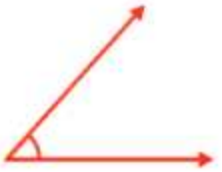
(c)  ☐

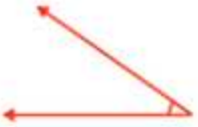
(d)  ☐

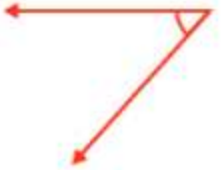
(e)  ☐

(f)  ☐

(g)  ☐

(h)  ☐

(i)  ☐

(j)  ☐

2. Draw the following angles by using protractor.

(a) 15° (b) 40° (c) 42° (d) 53°

(e) 65° (f) 75° (g) 90° (h) 110°

(i) 117° (j) 135° (k) 157° (l) 180°

3. Pick out the acute angle, obtuse angle and right angle from the following :

(a) 35° (b) 89° (c) 120° (d) 100°

(e) 96° (f) 74° (g) 62° (h) 166°

4. Fill in the blanks :

(i) An angle between 0° and 90° is called ..... .

(ii) 175° angle is ..... angle.

(iii) The hands of a clock make an angle of ..... at 3 a.m.

(iv) Measurements of an angle between North and South direction is .....

(v) An actue angle is ..... than right angle.

5. Tick the True and False.

(i) Measurement of right angle is 90°.

(ii) Right angle is greater than acute angle but smaller than obtuse angle.

(iii) On the Internal and External scale of protractor, measurements are written up to 90°.

(iv) 85° is a right angle.

(v) 115° is an obtuse angle.

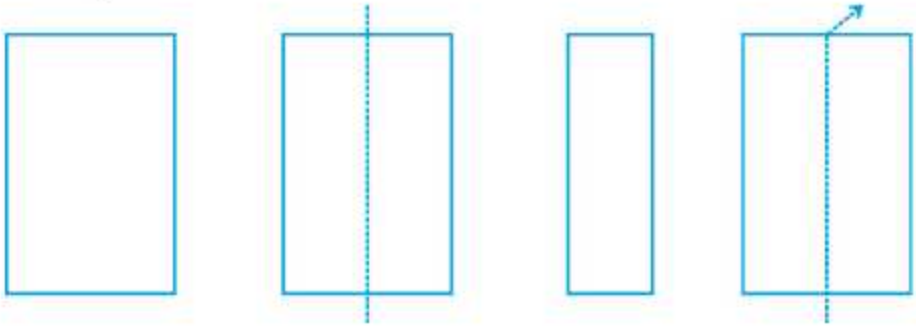
(vi) 90° is an acute angle.

7.5 Symmetry

When a shape or a figure is divided into two parts of equal shape and size with a line then that line is called **symmetrical line**.

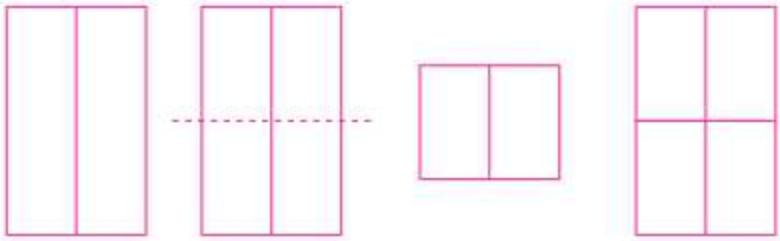
Activity

Teacher will take one paper and fold it along its length. After opening this paper, we shall see that the paper is divided into two equal parts. This is called symmetrical shape.



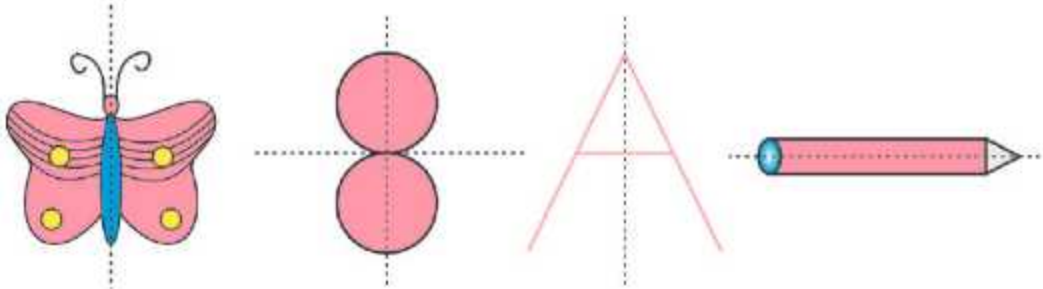
On paper, there will be crease that crease is called **line of symmetry**.

Similarly, teacher shall perform this activity by folding the paper along breadth.



So students, A shape has one or more than one Lines of symmetry also.

Here are some symmetrical pictures are as follows :

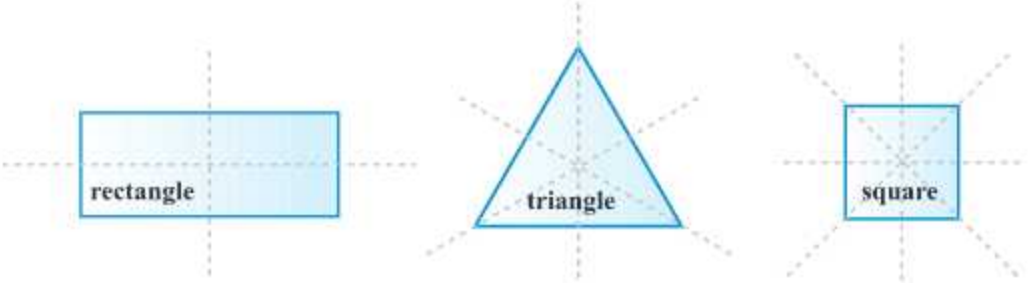


7.5.1 Symmetrical Shapes

When any shape is divided into two equal parts then this type of shape is called symmetrical shape. Both parts are like reflection of each other. Line of equal division is called Line of symmetry.

7.5.2 More than one lines of symmetry :

There are many shapes having more than one symmetrical lines.



- A rectangle has 2 symmetrical lines.
- A triangle of 3 equal sides has 3 symmetrical lines.
- A square has 4 symmetrical lines.

Exercise 7.3

1. Circle the symmetrical figures of the following :

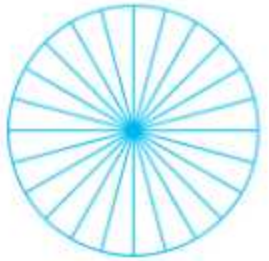
2. Draw symmetry line in the following :

3. Draw line of symmetry of the following :

1. 2. 3.

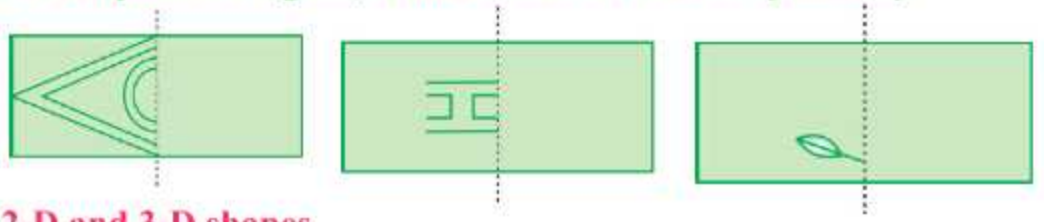
4.

5.



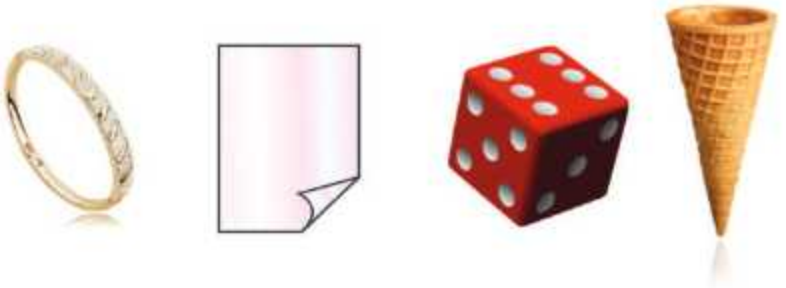
6.

4. Complete the figure, if dotted line is a line of symmetry.



7.6 2-D and 3-D shapes

Teacher will show some shapes to the students.



Teacher will explain that dice and cone are 3-D shapes and board's surface is 2-D so we can not draw them on the board. We can only estimate them.

- 3-D shapes can not be drawn on board, we can take only their estimates.
- 2-D shapes have only two dimensions (length and breadth) and 3-D shapes have 3 dimensions (length, breadth and height)

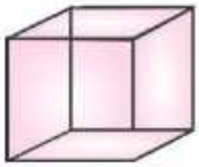
Exercise 7.4

1. **Pick out 2-D and 3-D shapes from the following : Encircle 2-D shapes ◯ and draw △ on 3-D shapes.**

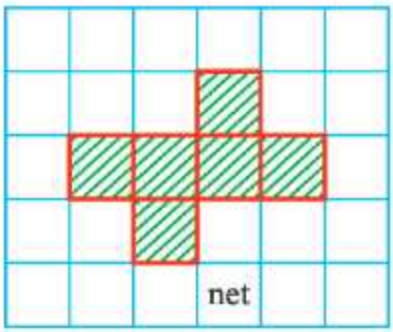
7.6 Making 3-D shapes from 2-D shapes

As we have studied in the last section that 3-D shapes are different from 2-D shapes. We can make 3-D shapes from the notes of 2-D shapes. Cube is the simplest shape as all its faces are squares.

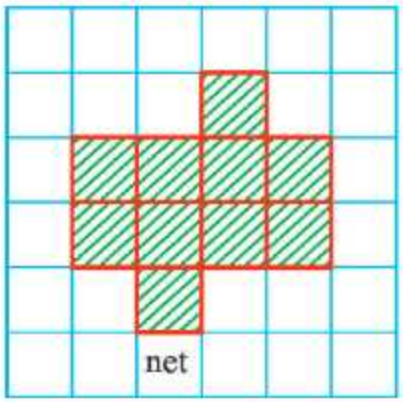
- How many faces does a cube have ? six
- What is the shape of these faces ? square

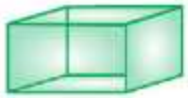


We have given some examples as under of the nets with which we can form 3-D shapes.

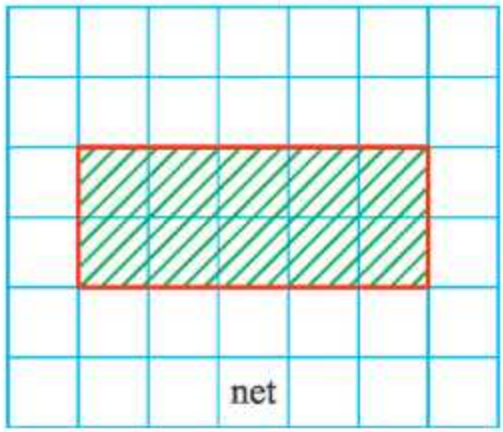



cube





cuboid



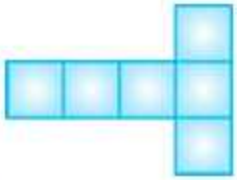
cylinder

Exercise 7.5

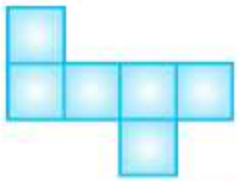
1. **Give an examples of the following from the surroundings :**

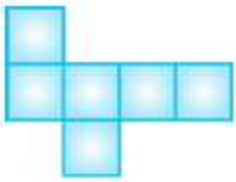
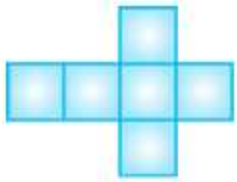
Figure	Example
Cuboid	
Cube	
Cone	
Cylinder	

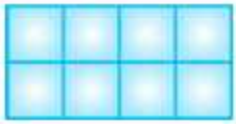
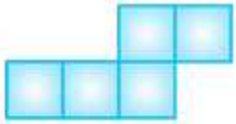
2. **Which of the following can form cubes ? Draw them on paper and find answers :**

(a) 

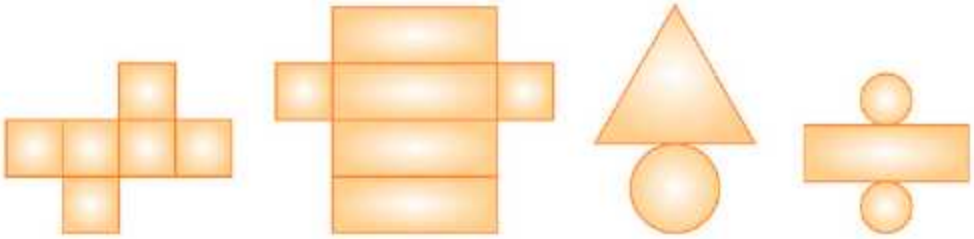
(b) 

(c) 

(d)  (e)  (f) 

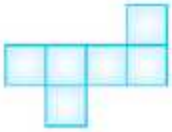
(g)  (h) 

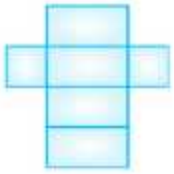
3. Name the figures made from the following nets :

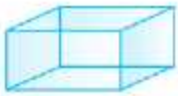


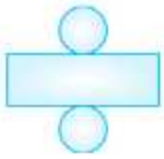
(a) (b) (c) (d)

4. Match the following figures with their nets :

(a)  

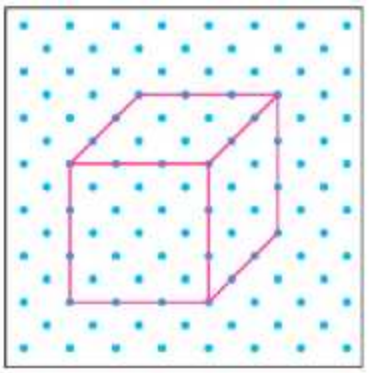
(b)  

(c)  

(d)  

Do it yourself

We can draw cube and cuboids on isometric sheet. We are drawing cube as an example.



Teacher shall motivate students to draw cuboid on this sheet.

Important Words

2-D Shapes	-	These shapes have two sides (length and breadth)
3-D Shapes	-	These shapes have 3 sides (length, breadth and height)
Protractor	-	An instrument, to measure angles.
Degree	-	Unit of angle measurement.

Things to Remember

1. The angles are made on the point where lines bisect.
2. While naming the angle vertex is written in the middle.
3. The unit for measuring an angle is degree.
4. The angles between 0° to 90° are called acute angles, 90° angle is called right angle, angles between 90° to 180° are called obtuse angles.
5. The angles are measured with the help of protractor.
6. If any shape can be divided into two equal parts, this is called a symmetrical shape.

Learning Outcomes

1. Difference between 2-D and 3-D shapes.
2. Basic concept of angles
3. About right angle
4. Types of angles
5. Symmetrical Shapes

Answers

Exercise 7.1

1. (a) acute angle (b) obtuse angle (c) acute angle
(d) right angle (e) obtuse angle (f) acute angle

Exercise 7.2

3. (a) acute angle (b) acute angle (c) obtuse angle
(d) obtuse angle (e) obtuse angle (f) acute angle
(g) acute angle (h) obtuse angle

4. (i) acute angle (ii) obtuse angle (iii) right
(iv) 180° (v) smaller

5. (i) True (ii) True (iii) False
(iv) False (v) True (vi) False

Chapter- 8

Perimeter and Area

Objectives :
1. To make the students use their mathematical and logical reasoning.
2. To make the students capable of measuring exact perimeter and area of their surrounding regions.
3. To make students capable of solving the problems of perimeter and area in daily life.
4. To do away with phobia of Maths from student's mind and create interest.
5. Teach the importance of the Subject of Mathematics.

Introduction

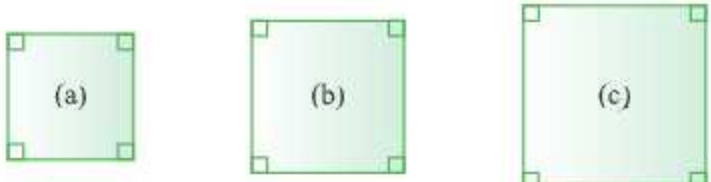
8.1 Perimeter :

We have studied about perimeter in detail in previous class that 'the distance around a figure is the perimeter of the figure'.

In simple words, the sum of the lengths of all sides of a plane figure in called Perimeter.' In this section, we shall discuss about perimeter of square and rectangle.

8.1.1 Square :

Square is a closed figure in which all the four sides are equal and each angle is a right angle (90°). Let us consider some figures of a square :



3 cm 5 cm 7 cm

Because, all the sides of a square are made of equal line segments. So perimeter of a square is the sum of the length all sides. So the perimeter of all squares are as follows :

Square	Side of Square	Perimeter of Square = sum of all sides.
(a)	3 cm	(3 + 3 + 3 + 3) cm = (4 × 3) cm = 12 cm
(b)	5 cm	(5+ 5 + 5 + 5) cm = (4 × 5) cm = 20 cm
(c)	7 cm	(7 + 7 + 7 + 7) cm = (4 × 7) cm = 28 cm

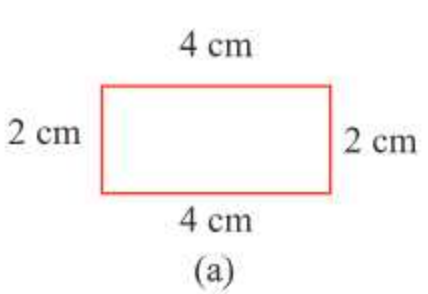
We observe that, the Perimeter of square = Side + Side + Side + Side

$= 4 \times$ side

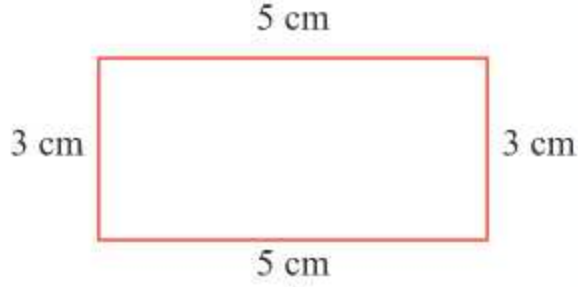
and $\text{Side of square} = \dfrac{\text{Perimeter of Square}}{4}$

8.1.2 Rectangle :

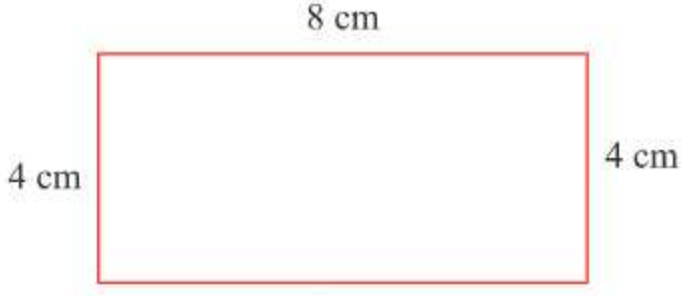
Rectangle is a closed four sided figure in which opposite sides are equal and each angle is of 90°. The sides of a rectangle are also line segments. So Perimeter of a rectangle is the sum of the lengths of all the sides.



(a)



(b)



(c)

So perimeter of all rectangles are written as follows:

Rectangle	Length	Breadth	Perimeter = Sum of sides
(a)	4 cm	2 cm	(4 + 2 + 4 + 2) cm = (4 + 4 + 2 + 2) cm = 12 cm
(b)	5 cm	3 cm	(5 + 3 + 5 + 3) cm = (5 + 5 + 3 + 3) cm = 16 cm
(c)	8 cm	4 cm	(8 + 4 + 8 + 4) cm = (8 + 8 + 4 + 4) cm = 24 cm

So we observe

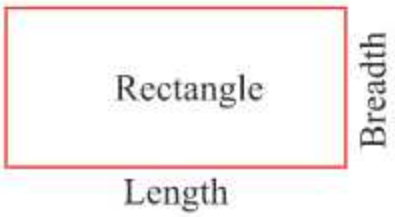
Perimeter of Rectangle

= length + breadth + length + breadth

= length + length + breadth + breadth

= 2 × length + 2 × breadth

= 2 × (length + breadth)



$$\text{Length/Breadth of Rectangle} = \left(\frac{\text{Perimeter of Rectangle}}{2}\right) - \text{Breadth/Length}$$

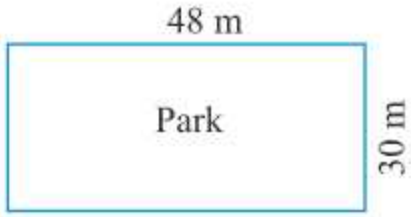
Teacher will say to students make rectangles and squares by cutting cardboards and then tells them to find their perimeters by adding lengths of all the sides.

Example 1 : The length and breadth of a rectangular park is 48 m and 30 m respectively. A wire is to be fenced all around. Find the length of the wire.

Solution : Length of the park = 48 m

Breadth of the park = 30 m

This park is rectangular



So the perimeter of rectangular park = 2 × (length + breadth)

= 2 × (48 + 30) = 2 × 78

= 156m

The length of required wire is 156 m.

So, 156 m wire is fenced all around the park.

Example 2 : Find the perimeter of the square, whose side is 5 cm.

Solution : Side of square = 5 cm

Perimeter of square = 4 × side

= 4 × 5

= 20 cm

Example 3 : The perimeter of a square is 32 cm. Find its side.

Solution : Perimeter of square = 32 cm

$$\text{So side of square} = \frac{\text{Perimeter of square}}{4} = \frac{32}{4} = 8 \text{ cm}$$

Example 4 : The perimeter of a rectangle is 120 cm. If its length is 40 cm then find its breadth.

Solution : Perimeter of a rectangle = 120 cm

Length of a rectangle = 40 cm

$$\text{Breadth of a rectangle} = \left(\frac{\text{Perimeter}}{2}\right) - \text{length}$$

$$= \left(\frac{120}{2}\right) - 40 \text{ cm}$$

= 60 – 40

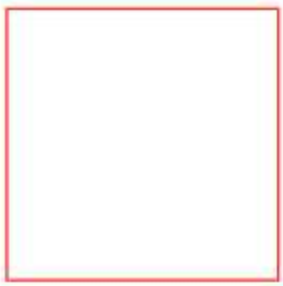
= 20 cm

Exercise-8.1

1. Find the perimeter :

(a)

(b) 5 cm



2. **Find the perimeter of the rectangle whose length and breadth are as follows :**

   (a) 3 cm, 2 cm (b) 12 m, 10 m (c) 15 cm, 8 cm

3. **Find the perimeter of the square, whose side is**

   (a) 4 cm (b) 8 cm (c) 10 cm (d) 72 mm

4. **Find the side of the square whose perimeter is**

   (a) 48 cm (b) 80 m (c) 24 m

5. The length and breadth of a rectangular park is 96 m and 64 m respectively. Find the length of wire which can fence it all around.

6. The perimeter of the rectangular park is 84 m. Find its breadth if length is 24 m.

7. A player runs around a square track of side 50 m. How many rounds will he take to complete the race of 2000 m ?

8. **Fill in the blanks :**

   (a) Perimeter of rectangle = 2 × (length + ...)

   (b) Perimeter of square = ... × side

   (c) The perimeter of a closed figure, made of line segments, is ..... of lengths of its all sides.

8.2 Area :

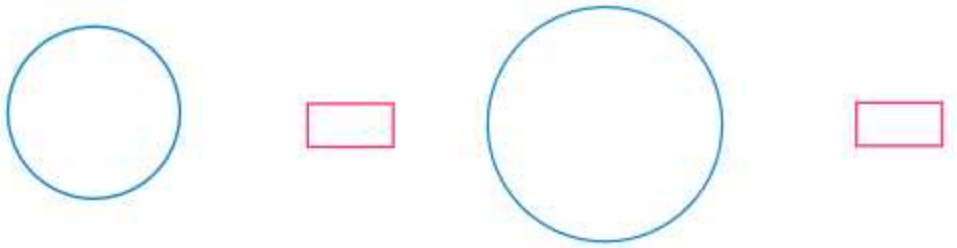
In last section, we have discussed about perimeters of square and rectangle. Now we shall discuss about their areas.

"The amount of surface covered by a figure is known as the area of the figure."

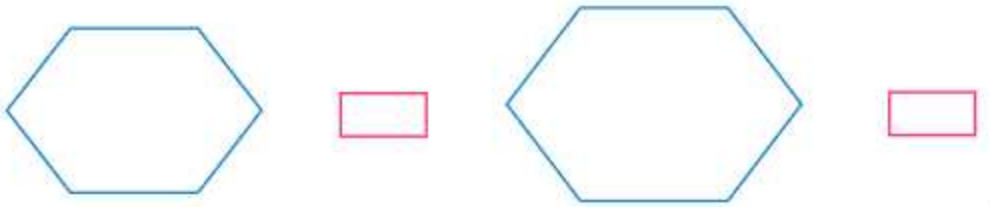
Which figure has covered more space, mark (✓) in the given blank box.

1.

2.

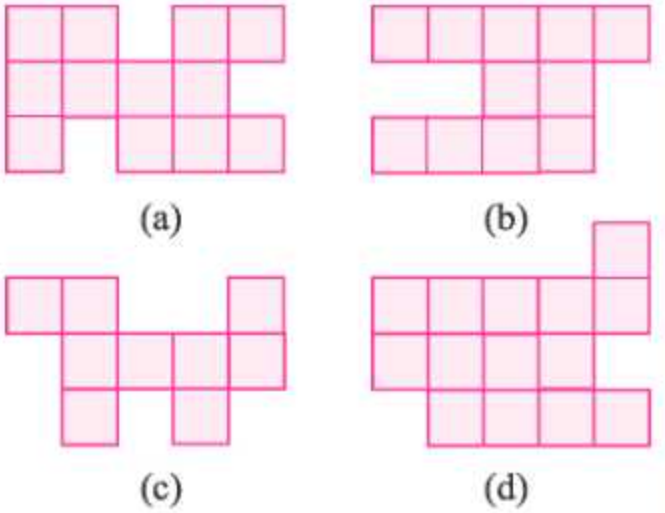


3.



Activity

Out of the following irregular figures, Count the number of squares to find the largest and smallest one.



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

So

largest figure = ...

smallest figure = ...

It is clear that figure (d) is largest and figure (c) is the smallest because figure (d) has largest amount of covered area (14 squares) and figure (c) has smallest amount of covered area (9 squares). So, the amount of surface covered is the area of that figure.

"Area is the measurement of surface covered by the closed figure".

8.2.1 Units of Area :

We know that the units of length commonly used are : meter, centimeter, millimeter. So for finding the area of any region, we consider squares of 1m, 1cm, 1 mm as units.

Units of Side	Units of Area
Millimeter (mm)	square millimeter (square mm)
Centimeter (cm)	square centimeter (square cm)
Meter (m)	square meter (square m)

Side of square = 1 mm
Area of square = 1 square mm

Side of square = 1 cm
Area of square = 1 square cm

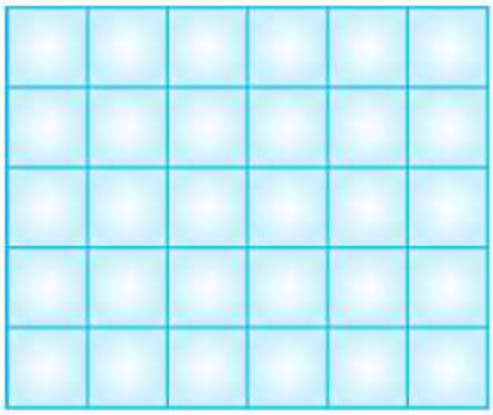
Side of square = 1 m
Area of square =1 square m

Activity

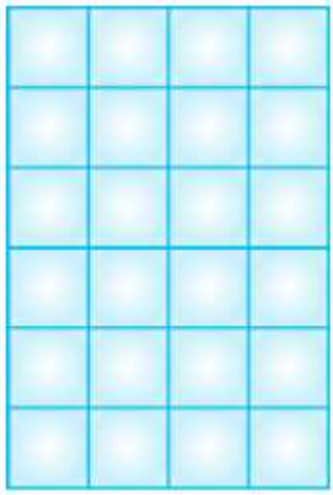
(*a*) By counting the number of squares in the following rectangles, find the area of rectangles. If the side of each square is 1 cm and its area is 1 square cm.

(a)

(b)



(c)



(d)

Area of Rectangle (a) = 12 square cm

Area of Rectangle (b) = ...

Area of Rectangle (c) = ...

Area of Rectangle (d) = ...

(*b*) In the above rectangles, count the number of squares along their length and their breadth and find their product.

Rectangle (a) : length = 4 cm and breadth = 3 cm

Multiplication = length × breadth = 4 cm × 3 cm = 12 square cm

Rectangle (b) : length = ... and breadth = ...

Multiplication = ... × ..... = ...

Rectangle (c) : length = ... and breadth .....

Multiplication = ... × ..... = ...

Rectangle (d) : length = ... and breadth .....

Multiplication = ... × ..... = ...

Observe this carefully : Area of Rectangles (a), (b), (c), (d) is same as the multiplication of their length and breadth.

So, Area of rectangle = length × breadth

A rectangle which has same length and same breadth, is called square.

Length = breadth = side of square

Area of square = side × side

Example 1 : In the following figure, length and breadth of rectangle is given, find its area and perimeter.

Solution :

Length of rectangle = 12 m

Breadth of rectangle = 6 m

Area of rectangle = length × breadth

= 12 m × 6 m = 72 square m.

Perimeter of rectangle = 2 × (length + breadth)

= 2 × (12 + 6)

= 2 × 18

= 36 m

Example 2 : Find the area of rectangle whose length is 16 cm and breadth is 8 cm.

Solution :

Length of rectangle = 16 cm

Breadth of rectangle = 8 cm

Area of rectangle = Length × Breadth = 16 cm × 8 cm

= 128. sq × cm

Example 3 : The length and breadth of rectangular sheet is 3 m and 90 cm respectively. Find its area.

Solution :

Length of rectangular sheet = 3 m = 3 × 100 cm

= 300 cm

(Because 1 m = 100 cm)

Breadth of rectangular sheet = 90 cm

Area of rectangular sheet = Length × Breadth

= 300 cm × 90 cm

= 27000. sq cm

Example 4 : A farmer has square field of side 170 m. What is the area of the field ?

Solution :

Side of square field = 170 m

Area of square field = side × side

= 170 m × 170 m

= 28900 sq.m

Example 5 : The length and breadth of floor of a room is 4 m and 3 m respectively. How many tiles of length 25 m and breadth 15 cm. will be used to cover the entire floor ?

Solution :

Length of the floor = 4 m = 400 cm

Breadth of the floor = 3 m = 300 cm

Area of the floor = 400 cm × 300 cm

= 120000 sq.cm

Length of a tile = 25 cm

Breadth of a tile = 15 cm

Area of a tile = 25 cm × 15 cm = 375 sq.cm

$$\text{Number of tiles} = \frac{\text{Area of the floor}}{\text{Area of a tile}}$$

$$= \frac{400 \times 300}{25 \times 15} = \frac{120000}{375} = 320 \text{ Tiles}$$

For Teacher: -

1 m = 100 cm

1 square m = 1 m × 1 m = 100 cm × 100 cm = 10000 sq.cm

So 1 sq.m = 10000 sq. cm

The relation of other units can be taught in the same way.

Exercise-8.2

1. **Find the area of following rectangles whose length and breadth are as follows :**

   (a) 9 m and 7 m
   (b) 85 cm and 76 cm
   (c) 23 mm and 18 mm
   (d) 5 m and 85 cm
   (e) 840 cm and 7 m

2. **Find the area of square whose side is :**

   (a) 25 cm
   (b) 48 cm
   (c) 27 mm
   (d) 87 m

3. Find the area of rectangular park whose length is 62 m and breadth is 38 m.

4. The side of a carrom-board is 60 cm. Find its area .

5. The length and breadth of a rectangular field is 100m and 45m. What is the cost of levelling its floor at the rate of ₹ 8 per sq. m ?

6. A carpet has a length 8 m and breadth 5 m. In an auditorium, 125 such carpets are being set on the floor. Find the area of the floor of the auditorium.

7. The verandah of Gurpreet's home is 52m long and 32m wide and the verandah of Pankaj's home is of square shape with side 41m. Which person's home has a roof of verandah is bigger and by how much ?

8. Roof of Amarjeet's home is of length 8m and breadth 6m. There is a leakage of water from the roof. He wants to fix tiles of size 30 cm long and 20 cm wide for plugging the leakage. How many tiles does he need ?

9. **Fill in the blanks :**

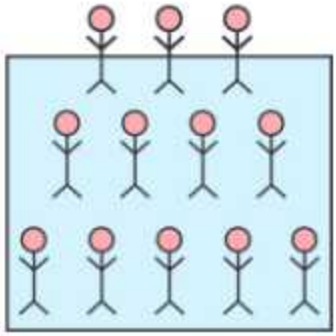
   (a) Area of rectangle = ... × .....
   (b) Area of square = ... × .....
   (c) 1 sq. m = ... sq. cm
   (d) The space covered by a closed figure is called ..... .

10. Complete the Table :

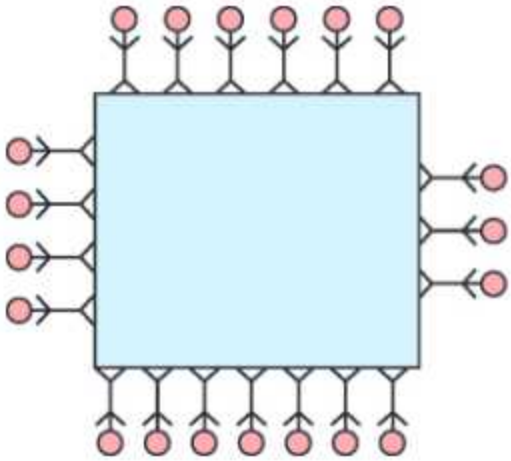
Rectangle	a	b	c	d
Length	8 m	5 cm	.....	35 cm
Breadth	7 m	.....	4 mm	20 m
Area	.....	10 sq. cm	24 sq.mm	.....

Practical Activity

1. Teacher will draw a rectangle on the floor and will tell the students to stand within it. He will tell the students that the place, where they are standing on, is the area of the rectangle.



2. Now, the Teacher will tell the students to stand on the border of the rectangle and tell them that this is the perimeter of a rectangle.



In this way, teacher can clarify the difference between the perimeter and the area to the students with the help of some other activities.

Multiple Choice Questions (MCQs)

1. **Which type of figure is notebook's page ?**

   (a) Square (b) Rectangle

   (c) Triangle (d) Pentagon

2. **What is the perimeter of the square if its side is 6 cm ?**

   (a) 36 cm (b) 18 cm

   (c) 24 cm (d) 21 cm

3. **The four sides of square are ..... .**

   (a) different (b) equal

   (c) two equal pairs (d) none

4. **The length and breadth of rectangle is 6 m and 4 m. Find its perimeter.**

   (a) 36 m (b) 16 m

   (c) 20 m (d) 10 m

5. **A rectangular park is 65 m long and 35 m wide. Mukesh takes 4 rounds of it. How much distance is covered by him ?**

   (a) 100 m (b) 200 m

   (c) 400 m (d) 800 m

6. **What will be the area of a square whose side is 13 cm ?**

   (a) 169 cm (b) 169 sq. cm

   (c) 52 sq. cm (d) 26 sq. cm

7. **A chart is 125 cm long and 8 cm wide. Its a Area = ...**

   (a) 100 sq. cm (b) 1000 sq. cm

   (c) 1250 sq. cm (d) 1100 sq. cm

8. **If length and breadth of rectangle is equal then it is called ..... .**

   (a) Rectangle (b) Length

   (c) square (d) Perimeter

9. **Side × Side is the area of ..... .**

   (a) Square (b) Rectangle

   (c) Breadth (d) Circle

10. Area of a rectangle is 96 sq. cm. If its length is 12 cm then its breadth is :

(a) 8 cm (b) 9 cm

(c) 10 cm (d) 108 cm

Learning Outcomes

1. Students will be able to find the exact measurement of areas of surrounding surfaces.
2. Students will be able to compare square and rectangular shapes.
3. Students will be able to divide larger regions into smaller regions.
4. Students will be use the concept of area in practical life.
5. Students will be capable of calculating area of small surfaces and further area of bigger surfaces.

Answers

Exercise 8.1

1. (a) 22 m (b) 20 cm

2. (a) 10 cm (b) 44 m (c) 46 cm

3. (a) 16 cm (b) 32 cm (c) 40 m

(d) 288 mm

4. (a) 12 cm (b) 20 m (c) 6 m

5. 320 m

6. 18 m

7. 10 rounds

8. (a) breadth (b) 4 (c) sum

Exercise 8.2

1. (a) 63 sq.cm (b) 6460 sq cm (c) 414 sq. mm

(d) 42500 sq. cm (e) 588000 sq.cm

2. (a) 625 sq. cm (b) 2304 sq. cm (c) 729 sq. mm
(d) 7569 sq. m

3. 2356 sq. m

4. 3600 sq. cm

5. ₹ 36000

6. 5000 sq. m

7. Verandah of Pankaj's home is 17 sq.m larger

8. 900 Tiles

9. (a) Length × Breadth (b) Side × Side (c) 10000
(d) area

10. (a) 56 sq.m (b) 2 cm (c) 6 mm
(d) 700 sq. cm

Multiple Choice Questions (MCQ)

1. b	**2.** c	**3.** b	**4.** c	**5.** d
6. a	**7.** b	**8.** c	**9.** a	**10.** a

Chapter-9

Volume

Objectives :
1. To observe solid objects around you from Mathematical point of view, to think and find solutions of real life problems.
2. To estimate the space covered by the solids.
3. To compare the volume of solid objects like cube and cuboids in daily life.
4. Put things in order according to volume.
5. Students can learn to find exact measurement and not estimation.

Introduction

If we observe in our surroundings, we find that every object, person or animal covers some space. Similarly every solid object covers some space. Let us understand with the help of some activities.

Recap

(a) Tick (✓) the object which takes more space.

1.  ☐  ☐

Hint for the Teacher Teacher will show 5 solid things to the students and will ask them to name the objects coveringc more and less space.

2.  ☐  ☐

3.  ☐  ☐

4.  ☐  ☐

5.  ☐  ☐

(b) Write in ascending order according to the space each object covers.

Objects	Ascending Order
Eraser, Brick, Geometry Box	
Bowl, Jug, Glass	
Laddoo, Water melon, Apple	
Fridge, Car, Bus	
Sharpener, Bag, Maths Book	

Activity

To understand with the help of an activity how much space does a solid take ?

1. Place a cup full of water and keep it in an empty bowl or plate.
2. Insert an stone / potato in the cup carefully. We will see that solid will immerse in water and some water will spill out of the cup in the bowl or plate.
3. The water which spills out in the plate is the same as the space covered by the solid thing.
4. Now pick cup out of that bowl or plate and measure the water left in the bowl or plate with the help of a suitable instrument.
5. Water spilled out from the cup when the solid is immersed = space covered by that solid.
6. Now you can take different solids of different shapes and perform this activity and discuss with your friends.

9.1 Volume of Solids

In our daily life, we observe many solids like bottle, balls, bricks, stones, eraser etc. All these objects cover the space. In the activity stated above, the solid object which covers the space left by the spilled out water is the volume of that solid object.

9.1.1 Units for Volume

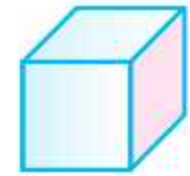
We have studied in the last chapter that we consider squares with sides 1 mm or 1 cm or 1 m as units for area. Similarly for the measurement of volume, we consider the cubes with sides 1 mm or 1 cm or 1 m.

In above activity, the volume of water taken out by the solid can be measured by pouring into cubes of sides 1 mm or 1 cm or 1m.

So the volume is written in the form of cubic mm, cubic cm or cubic meters.

Side = 1 mm
Volume = 1 cubic mm

Side = 1 cm
Volume = 1 cubic cm



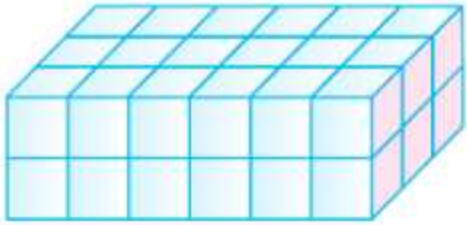
Side = 1 m
Volume = 1 cubic m

In the following figures, a cuboid is formed by joining small unit cubes. Every side of cube is 1 cm and the volume of each cube is 1cubic cm.

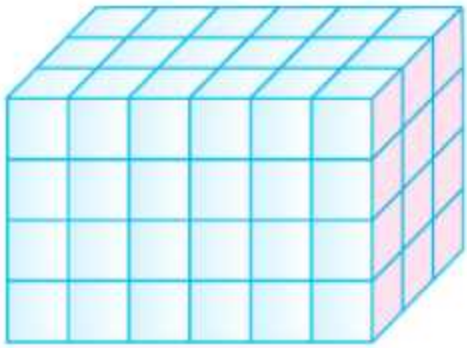
Find the volume of the cuboids by counting number of cubes :

(*a*) Volume of cuboid = 8 cubic cm

(*b*) Volume of cuboid = ...



(*c*) Volume of cuboid = ...



(*d*) Volume of cuboid = ...

Fill in the blanks by finding the length, breadth and height of the above cuboids and their multiplication with the help of your teacher :

Cuboid (*a*) : Length = No. of cubes = 4 cm,

Breadth = No. of cubes = 1 cm,

Height = No. of cubes = 2 cm,

their multiplication = Length × Breadth × Height

= 4 cm × 1 cm × 2 cm = 8 cubic cm

Cuboid (*b*) : Length = ... Breadth ..... Height .....

their multiplication = ... × ..... × ..... = ...,

Cuboid (*c*) : Length = ... Breadth ..... Height .....

their multiplication = ... × ....., × ....., = ...,

Cuboid (*d*) : Length = ... Breadth ..... Height .....

their multiplication = ... × ....., × ..... = ...

Observe carefully, the volume counted with the help of number of cubes is equal to the multiplication of its length, breadth and height.

So we conclude that volume of each cuboid is the multiplication of the length, breadth and height of the cuboid.

- **Volume of cuboid = Length × Breadth × Height**
- **Volume of Cube :**

A cuboid having equal length, breadth and height is called a cube.

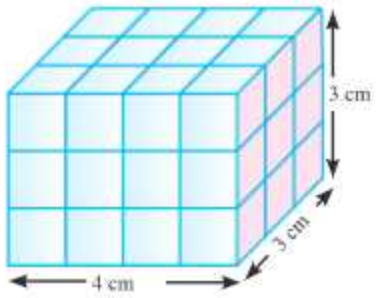
In a cube

Length = Breadth = Height = Side (Edge) of cube

So the volume of cube = Side × Side × Side

Example 1 : Find length, breadth, height and volume of the following cuboid.

Solution :



Length of cuboid = 4 cm

Breadth of cuboid = 3 cm

Height of cuboid = 3 cm

Volume of cuboid = Length × Breadth × Height

= 4 cm × 3 cm × 3 cm = 36 cubic cm.

Example 2 : A box is 5 cm long, 4 cm wide and 2 cm high. Find its volume.

Solution : Length of box = 5 cm

Breadth of box = 4 cm

Height of box = 2 cm

Volume of box = Length × Breadth × Height

= 5 cm × 4 cm × 2 cm = 40 cubic cm.

Example 3 : Find the volume of cube with side 4 cm.

Solution : Side of cube = 4 cm

Volume of cube = Side × Side × Side

= 4 cm × 4 cm × 4 cm = 64 cubic cm

Example 4 : The side of a cube is 5 cm and length, breadth and height (edge) of cuboid is 6 cm, 5 cm, 4 cm respectively. Which solid has more volume and by how much ?

Solution : Cube :

Side of cube = 5 cm

Volume of cube = Side × Side × Side

= 5 cm × 5 cm × 5 cm = 125 cubic cm

In, Cuboid :

Length = 6 cm

Breadth = 5 cm

Height = 4 cm

Volume of cuboid = Length × Breadth × Height

= 6 cm × 5 cm × 4 cm = 120 cubic cm

So volume of cube is cm more than the volume of cuboid by (125 – 120 = 5) cubic cm.

Example 5 : A cuboid is 2m long, 45 cm wide and 2 cm high. Find the volume in cubic cm.

Solution : Length of cuboid = 2 m = 2 × 100 = 200 cm

[As 1 m = 100 cm]

Breadth of cuboid = 45 cm

Height of cuboid = 2 cm

Volume of cuboid = Length × Breadth × Height

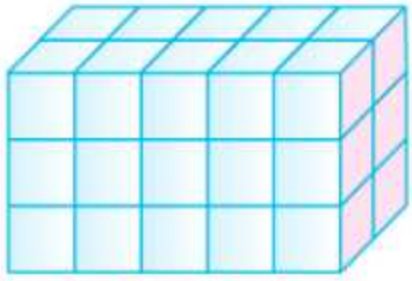
= 200 cm × 45 cm × 2 cm

= 18000 cubic cm.

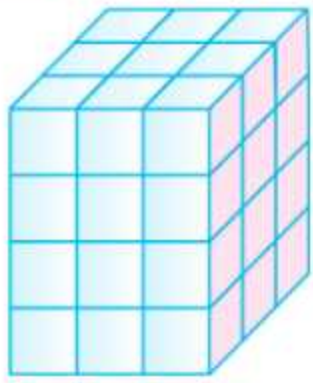
Exercise 9.1

1. Find the volume of the following by counting the number of cubes.

(*i*) Volume = ...



(*ii*) Volume = ...



(*iii*) Volume = ...

2. **Complete the table.**

Cuboid	(i)	(ii)	(iii)	(iv)	(v)
Length	3 cm	4 mm	25 m	7 cm	10 m
Breadth	2 cm	2 mm	20 m	7 cm	8 m
Height	1 cm	3 mm	12 m	7 cm	5 m
Volume					

3. **Find the volume of cube whose side (edge) is**

(i) 6 cm (ii) 8 m

(iii) 15 mm (iv) 21 m

4. **Find the volume of cuboid whose length, breadth and height is as follows :**

(i) 9 cm, 6 cm, 3 cm (ii) 12 mm, 9 mm, 4 mm

(iii) 15 m, 13 m, 12 m (iv) 22 mm, 16 mm, 12 mm

(v) 25 m, 23 m, 21 m

5. A chalk box is 8 cm long, 6cm broad and 10 cm high. Find the volume of the box.

6. A card board box is 50 cm long, 40 cm wide and 24 cm high. Find the volume of the box.

7. Jashan's tiffin box is 15 cm long, 10 cm wide and 8 cm high and Gurwinder's tiffin box is 12 cm long, 10 cm wide and 10 cm high. Find the volume of both. Whose tiffin box has more volume ?

8. Find the volume of 25 cuboidal boxes with dimensions 12 cm long, 9 cm wide and 6 cm high each.

9. There are two types of powder boxes available in the market. One is of cubical with side 8 cm and other is of cuboidal shape with length 15 cm, breadth 8 cm and height 4 cm. Which box has more powder and how much ? If both have same prices then which box will you prefer ?

10. How many bricks of size 24 cm long, 12 cm wide and 8 cm thick are required for making a wall of 12 m long, 3m high and 24 cm thick ?

11. The length, breadth and height of a biscuit packet is 15 cm, 9 cm and 6 cm respectively. If a packet has 30 biscuits then find the volume of each biscuit.

12. One trolley is full of bricks. It is 4m long, 2m wide and 60 cm deep. One brick is of size 20 cm × 10 cm × 6 cm. How many bricks are there in the trolley ?

13. **Fill in the blanks :**

(i) Volume of cube = ... × ..... × .....

(ii) Volume of cuboid = ... × ..... × .....

(iii) The space occupied by a solid is called .....

Multiple Choice Questions (MCQs)

1. **Tick (✓) the correct answer : (MCQs)**

(*i*) Volume of cube with 9 cm side is

(a) 81 cubic cm (b) 90 cubic cm

(c) 729 cubic cm (d) 8 cubic cm

(*ii*) Find volume of cuboid with length 6 cm, breadth 4 cm and height 2 cm

(a) 24 cubic cm (b) 28 cubic cm

(c) 64 cubic cm (d) 48 cubic cm

(*iii*) Which is not the standard unit of volume ?

(a) cubic cm (b) sq. m

(c) cubic mm (d) cubic meter

(*iv*) A cuboid with all sides equal is called ..... .

(a) square (b) cube

(c) cuboid (d) Rectangle

Learning Outcomes

1. Understanding and comparing the volumes of cubes and cuboids
2. Putting in order according to the volume
3. To learn to measure volume of object

Answers

Exercise 9.1

1. (i) 4 cubic cm (ii) 40 cubic cm (iii) 36 cubic cm

2. (i) 6 cubic cm (ii) 24 cubic mm (iii) 6000 cubic m
(iv) 343 cubic cm (v) 400 cubic m

3. (i) 216 cubic cm (ii) 512 cubic m (iii) 3375 cubic mm
(iv) 9261 cubic m

4. (i) 162 cubic cm (ii) 432 cubic m (iii) 2340 cubic m
(iv) 4224 cubic mm (v) 12075 cubic m

5. 480 cubic cm **6.** 48000 cubic cm

7. Both are equal, 1200 cubic m

8. 16200 cubic cm

9. cubical box is 32 cubic cm more, like to prefer cubical box.

10. 3750 bricks

11. 27 cubic cm

12. 4000 bricks

13. (i) side × side × side
(ii) Length × Breadth × Height
(iii) Volume

Multiple Choice Questions (MCQ)

14. (*i*) c (*ii*) d (*iii*) b (*iv*) b

Chapter-10

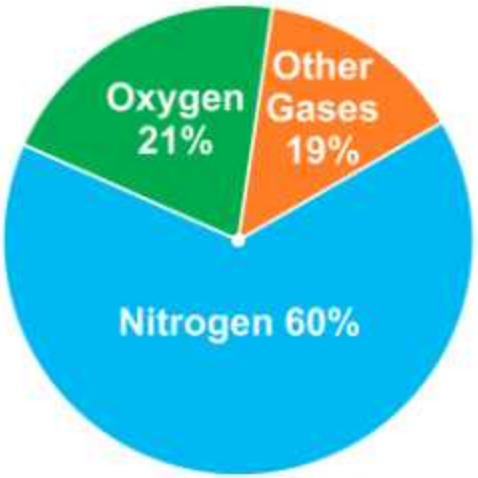
Data Handling

Objectives :
1. Represent the data by Pictograph or Bar graph.
2. To read and explain the given information on Bar Graph.
3. Represent the data in pie chart.
4. Comparison and understanding of two dimensional data.

Handling of Data :

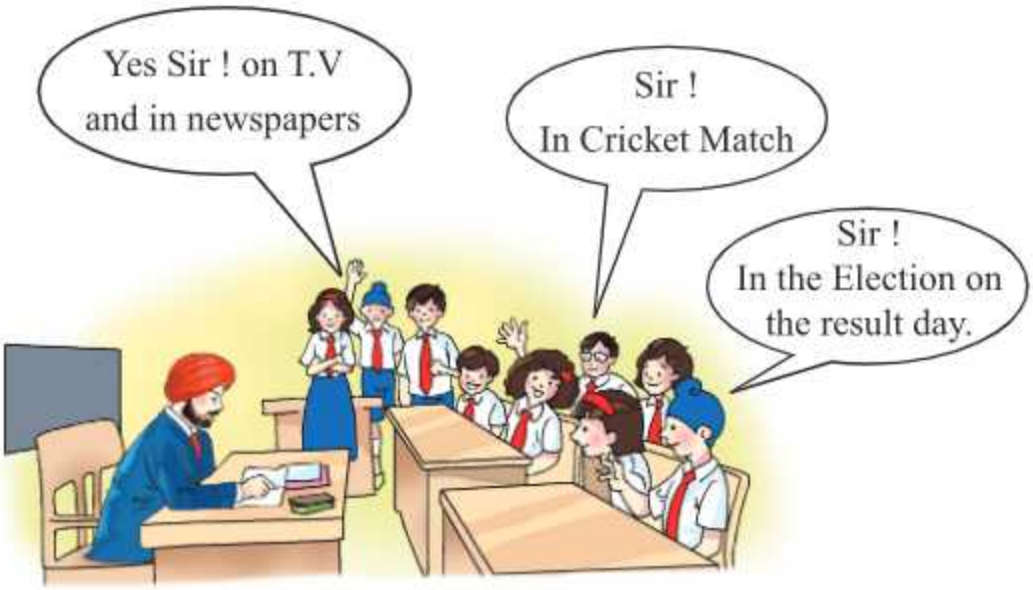
Recap

Bar Graph



Pie Chart

Teacher - Dear students, have you seen these type of pictures/ images on TV or news papers ?



Teacher - Very good ! we often see these picture graphs in magazines, newspapers and TV. From these graphs we understand every information in very simple manner easy to understand. Do you have any information about these graphs ? Today, we will study these in detail.

We are already aware of collection of data from previous classes. We can represent this data in the form of tables or pictures.

10.1 **(*i*) Pictograph :** Representation of the given data in form of pictures or symbols is called Pictograph. We can represent the pictograph in horizontal or vertical manner.

(*ii*) Bar Graph : A Bar Graph represents the data with the help of a number of rectangular bars of equal width in horizontal or vertical manner. The length of the rectangular bars represent on data.

(*iii*) Pie Chart : Data in the form of fractions is represented in a Pie Chart or a circle chart.

Hints For Teacher - Teacher will inspire the students to find pictures of these graphs from newspapers, magazines etc. and will tell them to paste in their note books.

Example 1 : The information of number of students studying in a primary school is as follows :

1st class = 50, 2nd class = 45, 3rd class = 56, 4th class = 36, 5th class = 60. Represent this information in tabulated form.

Solution : We can represent the above information in tabulated form as follows :-

Class	I	II	III	IV	V
Number of students	50	45	56	36	60

Example 2 : The table shows the sale of number of cars of five different cities Khanna, Patiala, Bathinda, Sarhind and Faridkot in September.

City	Khanna	Patiala	Bathinda	Sarhind	Faridkot
Number of Cars	600	300	400	200	500

Make a pictograph using the above information.

scale =  = 100 cars

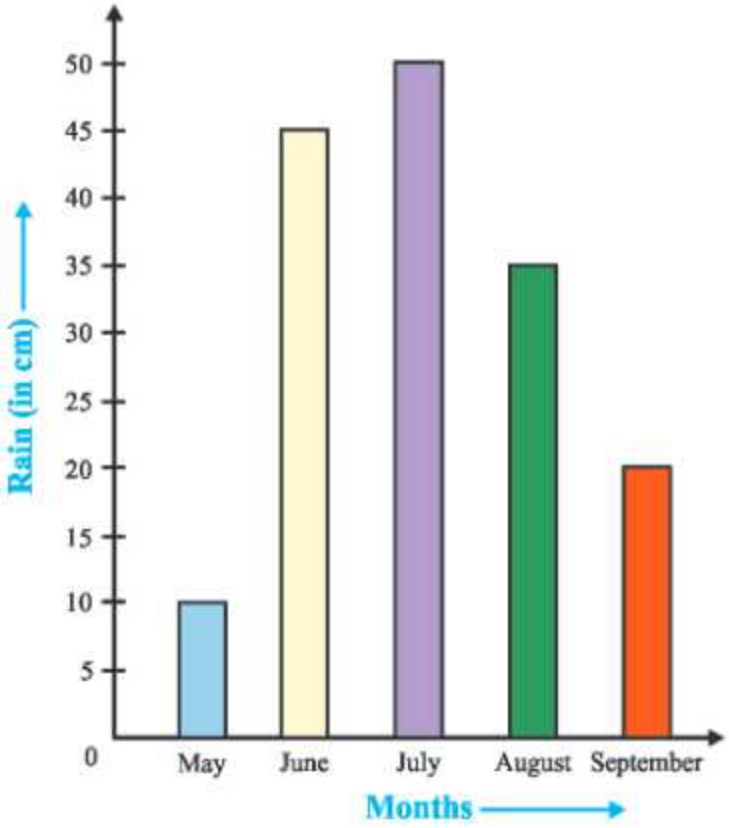
Solution : In the given table, sale of number of cars is different in different cities. So we consider symbol  = 100 cars.

Khanna	
Patiala	
Bathinda	
Sirhind	
Faridkot	

Example 3 : In the following table, the information of rain (in mm) in five months in a city is given :

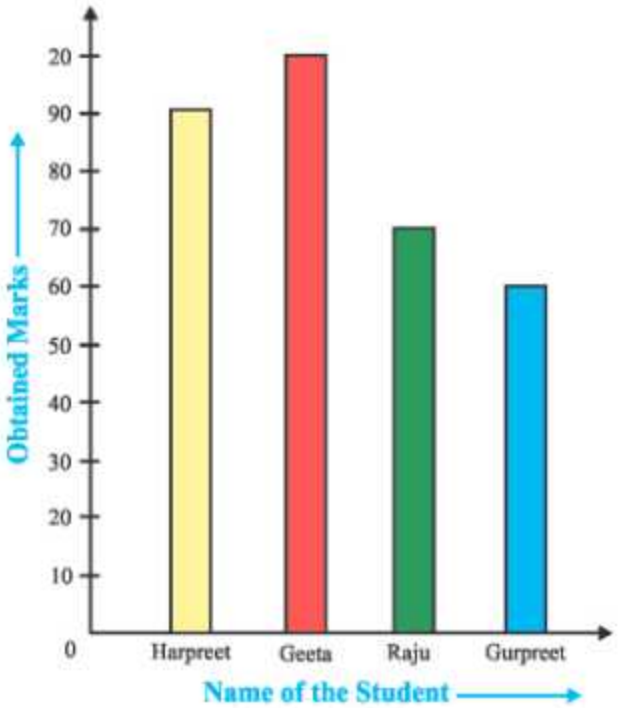
Month	Rain (in mm)
May	10
June	45
July	50
August	35
September	20

Prepare the bar graph showing the above information.



Example 4 : The following bargraph represents the obtained marks in a Maths test of Harpreet, Geeta, Raju and Gurpreet.

Hints For Teacher - Teacher will teach them to show half on the given scale.



Study the bar graph and answer the following questions :

1. **How many marks did Geeta obtain ?**

Ans : 100.

2. **Who obtained the highest marks ?**

Ans : Geeta.

3. **Who obtained the lowest marks ?**

Ans : Gupreet.

4. **Who scored more : Raju or Harpreet ?**

Ans : Harpreet.

5. **What is the difference of marks obtained by Geeta and Raju ?**

Ans : 100 – 70 = 30.

Example 5 : The following pie chart represents the favourite colours of 5th class students. Observe Pie Chart carefully and answer the following questions :-

(i) How many students of the class in fractions like green colour ?

Ans : $\frac{1}{4}$(one-fourth) of total students of the class like green colour.

(ii) Which colour is liked by most of the students of the class ?

Ans : Most of the students of the class like red colour most.

(iii) If there are 40 students in the class : How many students like green colour ?

Ans : $\frac{1}{\cancel{4}} \times \cancel{40}^{10} = 10$ students of the class like green colour.

(iv) How many students of the class like yellow colour ?

Ans : $\frac{1}{8} \times \cancel{40}^{5} = 5$ students of the class like yellow colour.

(v) How many students of the class like blue colour ?

Ans : $\frac{1}{8} \times \cancel{40}^{5} = 5$ students of the class like blue colour.

(vi) How many students of the class like red colour ?

Ans : $\frac{1}{2} \times \cancel{40}^{20} = 20$ students of the class like red colour.

(vii) How much more or less is the number of students who like red colour than blue colour ?

Ans : Number of students like red colour = 20

Number of students like blue colour = 5

So, 15 more students like red colour than blue colour.

Exercise 10.1

1. The students of a school visited a zoo for picnic. Students collected the data of number of different animals. The number of animals are as follows : Monkey - 32, Lion - 10, Deer - 25, Rabbit - 27 and Fox - 39. Represent the data in tabular form.

2. There is a circus in a village. The following pictograph represents the number of visitors children from Monday to Friday. Read the following pictograph carefully and answer the questions.

= 25 Children

Monday	
Tuesday	
Wednesday	
Thursday	
Friday	

(*i*) How many children visited circus on Tuesday ?

(*ii*) Which day had most children visited and how many ?

(*iii*) Which day had least children visited and how many ?

(*iv*) How many total number of children visited the circus on Monday and Wednesday ?

(*v*) What is the difference of number of children visited on Thursday and Friday ?

3. The following table shows the plantation of trees on Diwali day in 5 different villages on the eve of celebration of Green Diwali :

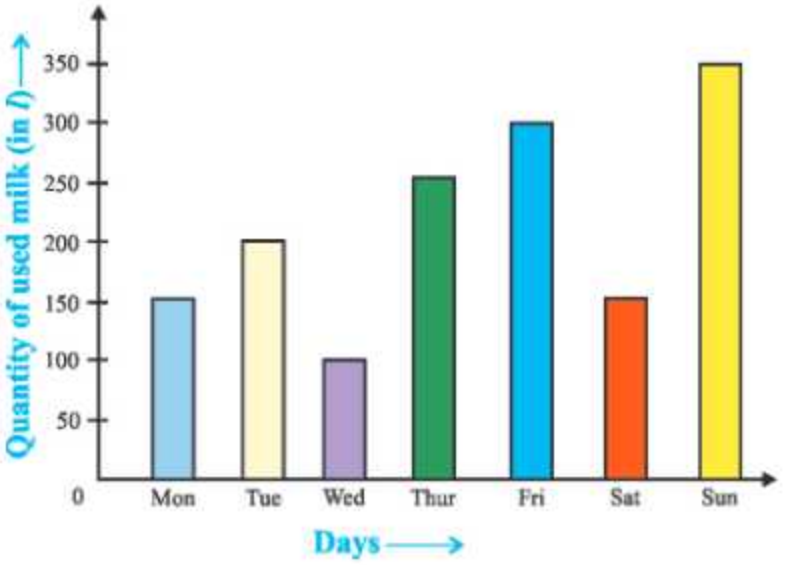
Village	A	B	C	D	E
Number of Trees planted	36	48	60	12	24

(*i*) Draw pictograph of the above data.

Hint :  = 12 trees

(*ii*) Draw another pictograph of above informaiton by any other scale.

4. The following Bar Graph represents the quantity of milk used in a week in a sweet shop during the festival season.



(*i*) On which day maximum milk is used ?

(*ii*) On which day minimum milk is used ?

(*iii*) On which two days, the quantity of milk used is the same and how much ?

(*iv*) How much total quantity of milk is used on Thursday and Friday ?

(*v*) How much less milk is used on Tuesday than Sunday ?

(*vi*) What is the difference of maximum and minimum quantity of milk used ?

5. The data of sold mobile phones of different companies of a shop in October is as follows :

Name of Company	Number of sold Sets
Company A	40
Company B	32
Company C	56
Company D	72
Company E	96

Draw the bar graph for the above data

Scale : 8 sets = 1 unit

6. The number of students from 1st to 5th class of a school is an follows

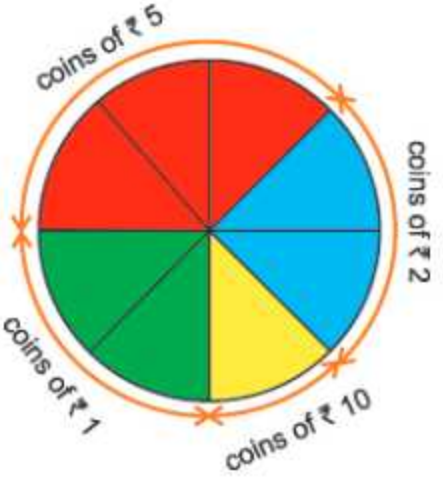
Class	Number of students
I	35
II	20
III	40
IV	30
IV	25

Draw the bar graph for the above data

Scale : 10 students = 1 unit

Hints For Teacher - Teacher gives buttons of different colour to the students and motivate the students to make Bar graph and Pictograph using them.

7.



The above Pie chart is divided into 8 equal parts. It represents the different number of coins in Ajay's Piggy Bank, then answer the following : If the number of total coins is 80

(*i*) How many coins of ₹ 5 are there ? (In fraction)

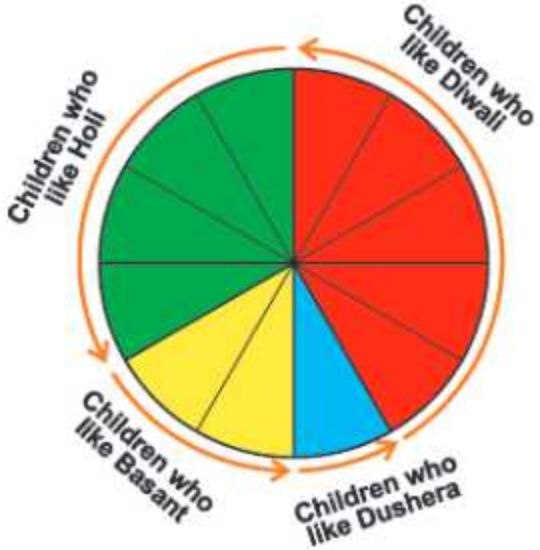
(*ii*) How many coins of ₹ 2 are there ?

(*iii*) Tell the number of coins of ₹ 5 ?

(*iv*) What is the amount of coins of ₹ 10 ?

(*v*) How much total amount there in Ajay's Piggy bank ?

8. Given pie chart is divided into 12 equal parts. It represents the favourite festivals of 120 students of a school. Read it carefully and answer the following :

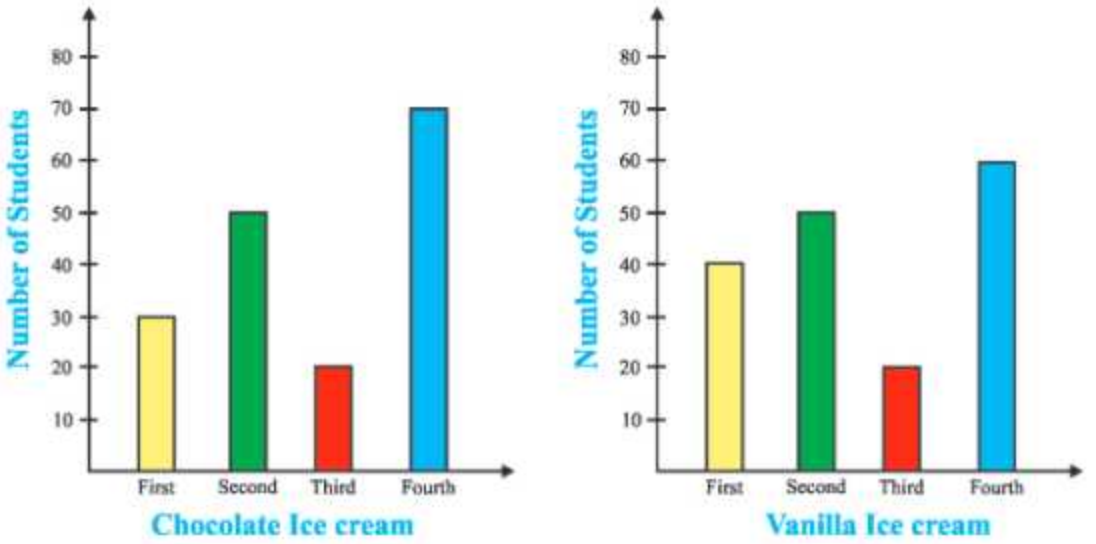


1. How many students (in fraction) like Diwali festival ?
2. How many students like Holi festival out of 120 students ?
3. Which festival is liked by minimum number of students ?
4. What is the difference of number of students who like Diwali and Basant ?

10.2. Comparing Bar Graphs/Pictographs (2 Dimensional Data)

We have learnt to study of the given bargraphs/pictographs and conclude the result. Now we shall learn to conclude the result of two dimensional bargraph or pictograph.

Example 1 : There are two bar graphs given below, which shows the number of students from 1st to 4th class who like chocolate and vanilla Ice cream.



Study both bar graphs carefully and answer the following :

1. Which flavour is mostly liked by 1st class students ?
   Vanilla
2. Which class has same number of students who like vanilla and chocolate ice cream equally ?
   Class Second and Third

Hints For Teacher - Teacher can motivate the students to prepare tables of number of boys and girls from 1st to 5th class and then draw Bar Graph, Compare this information (like in which class boys and girls have same number ? In which class boys are more/less than girls ? etc.)

3. What is the difference of preference between both flavours of 4th class students ?

Solution :

Number of students of 4th class who like chocolate ice cream = 70

Number of students of 4th class who like vanilla ice cream = 60

Difference = 70 – 60

= 10

Exercise 10.2

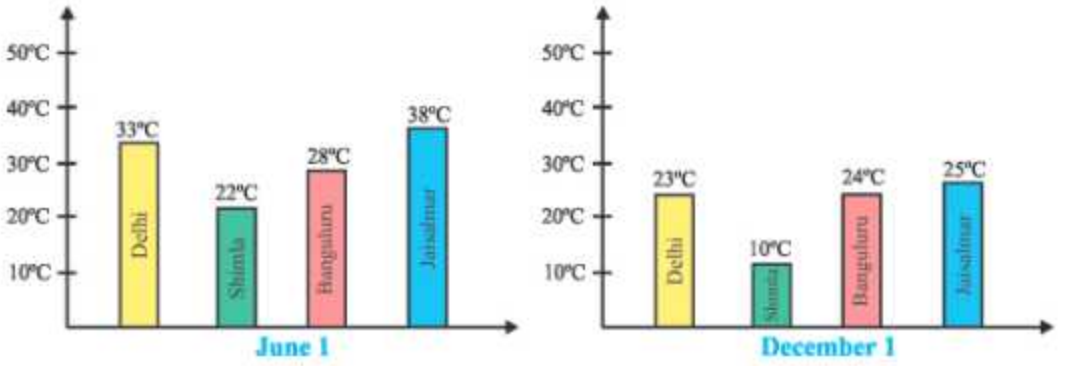
1. The following pictograph represents the number of boys of sections A, B, C, D of 5th class during sessions 2014-15 and 2015-16.

Class V	2014 – 15	2015 – 16
A	4	5
B	3	4
C	5	6
D	4	4

Hint : = 5 boys

1. In which session number of boys are more in Section A.
2. The number of students of Section D are ..... in 2014-15 and 2015-16 (equal/more/less)
3. Find the total number of boys in 2014-15.
4. Find the difference in number of boys of section C during both sessions.
5. How many more/less boys are there in 2015-16 than in 2014-15.

2. The following two Bar Graphs represents the maximum temperature of four cities in two different days. Four cities are Delhi, Shimla, Bangluru and Jaisalmer.



Answer the following from above Bar Graphs :

(*i*) Which city is the hottest on June 1 ?

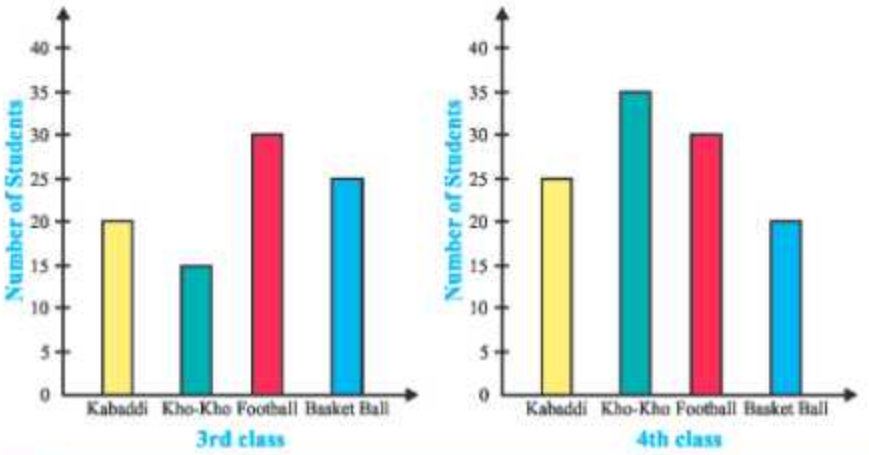
(*ii*) Which city is the coldest on December 1 ?

(*iii*) What is the difference in Delhi's temperature on June 1 and December 1 ?

(*iv*) What is the difference in Shimla's temperature on June 1 and December 1 ?

(*v*) Which city has lowest change in temperature on June 1 and December 1 ?

3. Study the following Bar Graph carefully.



Hints For Teacher -

- Teacher helps the students to find different cities in India's map so that they can understand the change in temperature and get the information of weather by collecting data.
- Teacher motivates the students to read weather report in daily newspaper and tell them to draw Bar Graph of maximum and minimum temperature of different cities.

Find :

(i) What information is provided by the above Bar Graph ?

(ii) Which game is played equally by students of 3rd and 4th class ?

(iii) What is the total number of students of 3rd and 4th class who play Kho-Kho ?

(iv) What is the total number of students of 3rd and 4th class who play Basketball ?

(v) Which is the favourite game of 3rd class students ?

(vi) Which is the favourite game of 4th class students ?

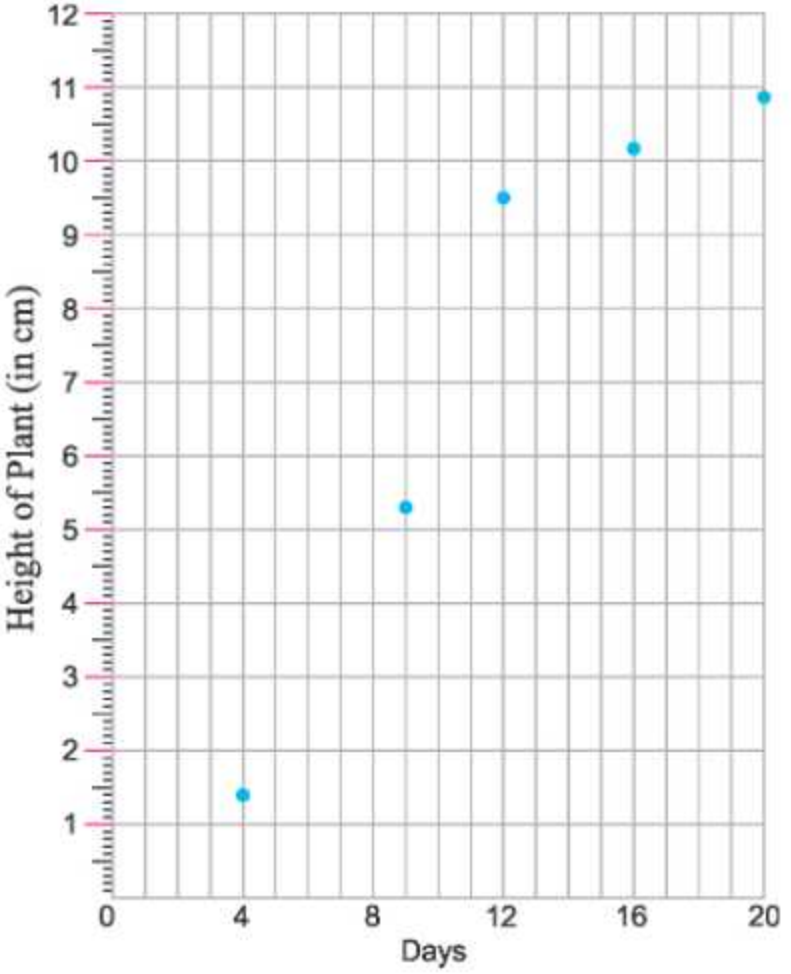
Activity

Chart of Growing plant :

Amit sowed some seeds of grams, the height of plant increased by 1.4 cm in next four days. Afterwards, it grew at rapid speed. The plants' height was measured after four days regularly and was written in tabular form and a point was marked on the chart given on next page.

Day	Height of Plant (in cm)
0	0
4	1.4
8	5.3
12	9.5
16	10.2
20	10.9

Look at the height of every point and compare the table that Amit has marked the correct point or not.



Find from the Graph :

1. During which days plant has grown maximum ?

   (*i*) 0 – 4 (*ii*) 4 – 8

   (*iii*) 8 – 12 (*iv*) 12 – 16

2. What will be the approximate height of plant on 14th day ?

(*i*) 8.7 cm (*ii*) 9.9 cm

(*iii*) 10.2 cm (*iv*) 10.5 cm

3. Will this plant increase always ? What will be the approximate length on 100th day ?

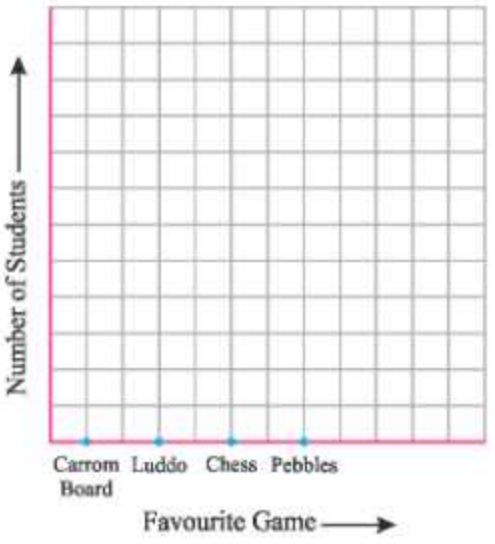
Practical Activity

Objectives — To draw Bar Graph after collecting data.

Required — Check paper, Pencil, Colours, Scale, White chart, Gum etc.

Procedure — 1. Paste the check paper on white chart.

2. Prepare Bar Graph of favourite game of students as shown below. Teacher shall motivate every student to participate in this.



3. Teacher will ask any one student about his/her most favourite game mentioned in Bar Graph.

Hints For Teacher

- Regarding last question, tell the students to discuss. Motivate the students to observe the growth of surrounding plants and animals.

4. After getting answer from student. Teacher will say him/her to colour one box of his/her favourite game in the bar graph.
5. In this way, teacher will do this process with every student.

Results — In this way, we have prepared a Bar graph of favourite game of 5th class students.

After this, teacher can ask the following questions to increase the interest and knowledge of students.

1. How many total students are there in the class ?
2. Which game is the least favourite ?
3. How many students have the most favourite game ?

Teacher can ask some extra questions also.

Things to Remember

1. Pictograph is the medium of representation of data.
2. In Pictograph, pictures are used to represent data.
3. Pictures are used for quantity in pictograph.
4. If number is more, we use pictures according to scale.
5. In Bar graph, Rectangular bars are used instead of pictures to represent data.
6. We use Pie- Chart to represent data in fractional form.

Multiple Choice Questions (MCQs)

1. The table shows the data of temperature of a city for a week.

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Temp.	36°C	34°C	38°C	40°C	39°C	40°C	41°C

(i) Which day is the hottest ?

(a) Tuesday (b) Thursday

(c) Sunday (d) Monday

(ii) Which day is the coldest ?

(a) Wednesday (b) Tuesday

(c) Saturday (d) Friday

(iii) What is the difference between the highest and the lowest temperature ?

(a) 6°C (b) 8°C

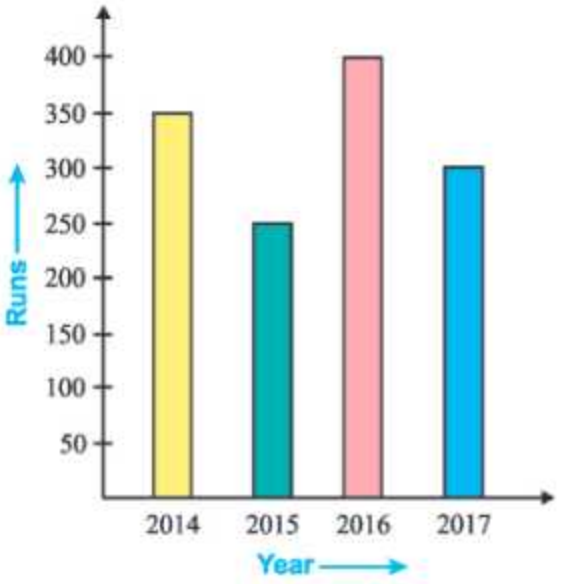
(c) 5°C (d) 7°C

(iv) Which two days are equally hot ?

(a) Thursday, Saturday (b) Sunday, Monday

(c) Thesday, Wednesday (d) Thursday, Friday

2. The runs scored by a cricketer in four consecutive years are as follows :



(i) How many runs were scored by the player in 2016 ?

(a) 300 (b) 400

(c) 350 (d) 200

(ii) In which year, the player scored the least runs ?

(a) 2017 (b) 2016

(c) 2015 (d) 2014

(iii) What is the difference of highest and lowest runs scored by a player ?

(a) 150 (b) 50

(c) 200 (d) 100

(iv) How many total runs he scored in four consecutive years ?

(a) 1100 (b) 1000

(c) 1300 (d) 1200

Learning Outcomes

1. Collecting the data and representing the information in picto graphs.
2. Collect and explain, compare and conclude the result of different pictograph/bargraphs given in newspapers/magazines.

Answers

Exercise 10.1

2. (*i*) 75 (*ii*) Thursday, 200 (*iii*) Monday, 50
   (*iv*) 175 (*v*) 50
4. (*i*) Sunday (*ii*) Wednesday (*iii*) Monday and Saturday
   (*iv*) 550 *l* (*v*) 150 *l* (*vi*) 250 *l*
7. (*i*) $\frac{3}{8}$ (*ii*) 20 (*iii*) 30 (*iv*) 100 Rupees
   (*v*) 310 Rupees
8. (*i*) $\frac{5}{12}$ (*ii*) 40 (*iii*) Dussehra (*iv*) 30

Exercise 10.2

1. (*i*) 2015-16 (*ii*) Equal (*iii*) 80
   (*iv*) 5 (*v*) 2015-16, 15 more boys
2. (*i*) Jaisalmer (*ii*) Shimla (*iii*) 10°C (*iv*) 12°C
   (*v*) Bangluru

3. (*i*) Bar graph shows the comparison of playing games of 3rd and 4th class students.

(*ii*) Football (*iii*) 50 (*iv*) 45 (*v*) Football

(*vi*) Kho-Kho

Multiple Choice Questions (MCQ)

1. (i) c (ii) b (iii) d (iv) a

2. (i) b (ii) c (iii) a (iv) c

Chapter-11

Patterns

Objectives :

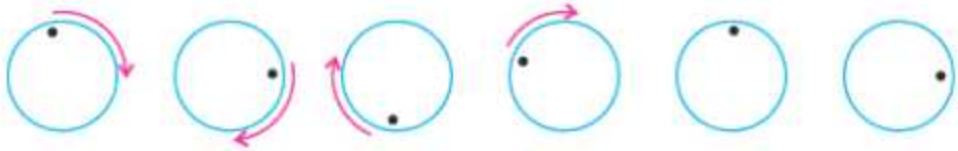
1. To prepare patterns in clockwise and anti-clockwise directions according to the given pattern.
2. To give information about triangular numbers and square numbers with the help of patterns.
3. To find relationship between square numbers and odd numbers.
4. To make different patterns with tiles.
5. To prepare patterns of multiplication and division.
6. Making magical shapes to develop interest in patterns.

Introduction

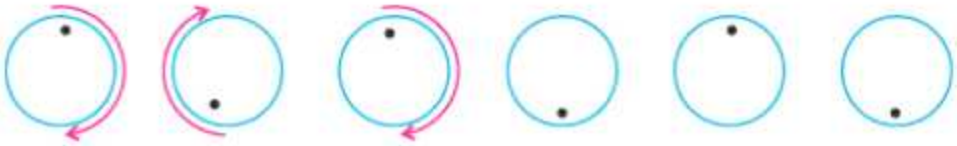
We have studied in previous classes that every pattern follows some specific rules, whether these are nets of windows/floor tiles/patterns on our clothes. Now we shall study some more advanced patterns.

11.1 Clockwise Patterns

Rule 1. Rotation in one-fourth



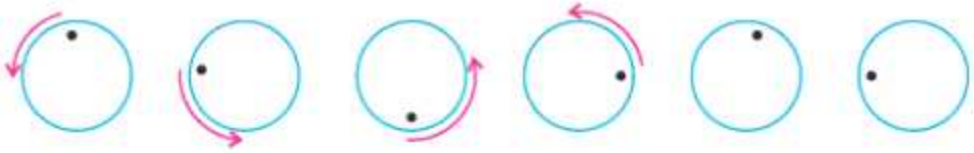
Rule 2. Rotation in half.



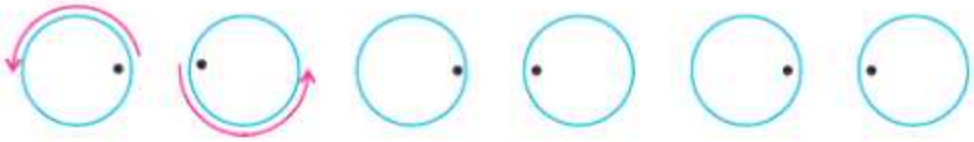
Rule 3. Rotation with three-fourths

Similarly, we can make patterns by rotating in anti clockwise direction as well.

Example 1 : Rotation in one fourth.



Rotation in half.

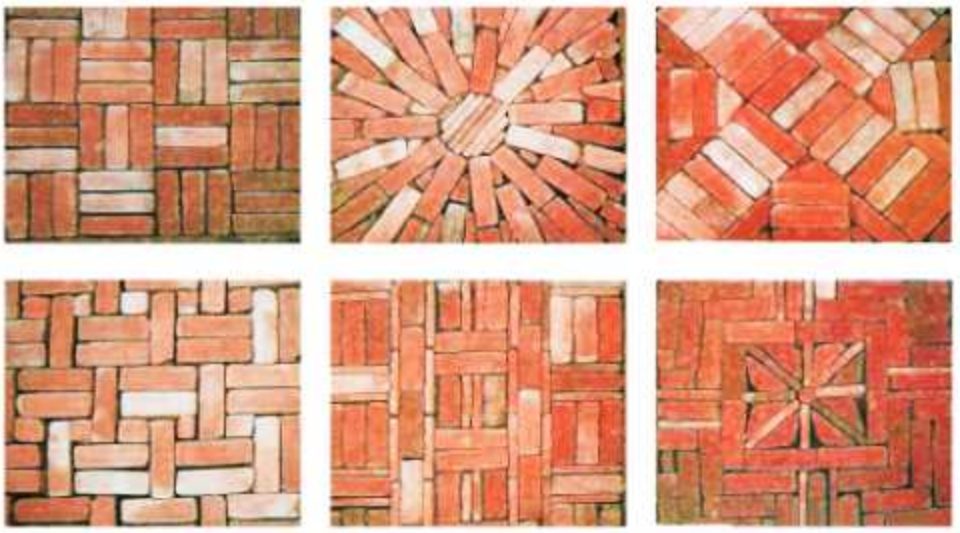


11.2 Patterns of bricks/tiles of different shapes.

In our school we find the different patterns of bricks/tiles in different shapes which are made by the masons.

Every mason creates his different patterns and designs. We feel proud of our beautiful school building.

Some of these patterns are shown as under :



- Which pattern resembles a circle ?
- Which pattern as seen in the mirror can be divided into two identical halves ?
- Now you all will create some patterns on the floor.

11. 4 Triangular Numbers

Now, I shall explain you triangular numbers with the help of dots.

1 $\quad$ $1 + 2 = 3$ $\quad$ $1 + 2 + 3 = 6$ $\quad$ $1 + 2 + 3 + 4 = 10$

So we can say that 1, 3, 6, 10, ... are Triangular Numbers.

For Teacher: - The students can look for similar patterns in the nearby Gurudwaras, Temples. The students can be motivated to make such patterns in the school garden or at home.

11.4 Square Numbers

$1 \times 1 = 1$ $\quad 2 \times 2 = 4$ $\quad 3 \times 3 = 9$ $\quad 4 \times 4 = 16$

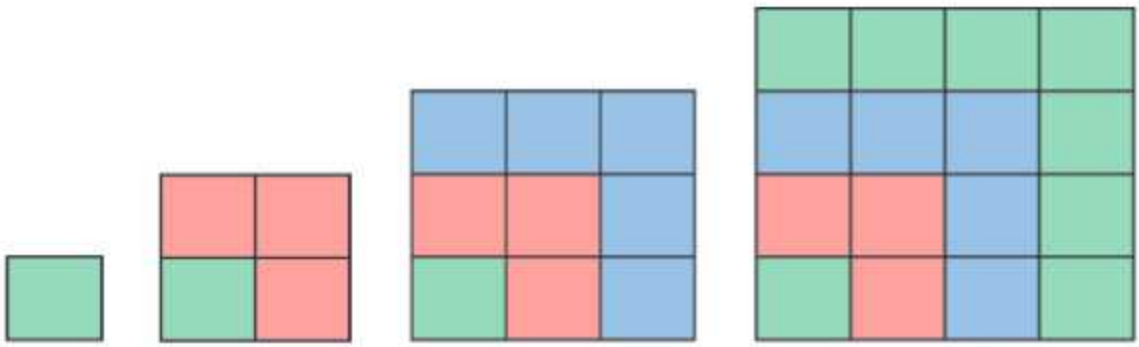
So we observe that 1, 4, 9, 16 ..... are Square Numbers.

Some interesting facts about Square Numbers.

We can say after looking at Square Numbers that square of odd numbers is odd number and square of even numbers is an even number.

$1 \times 1 = 1$
$2 \times 2 = 4$
$3 \times 3 = 9$
$4 \times 4 = 16$
.....
.....

Square Numbers can also be represented in following manner :



1 $\quad 1 + 3 = 4$ $\quad 1 + 3 + 5 = 9$ $\quad 1 + 3 + 5 + 7 = 16$

Similarly, we can explain the relationship between Square Numbers with the odd numbers.

$1 = 1 \times 1$
$4 = 2 \times 2 = 1 + 3$
$9 = 3 \times 3 = 1 + 3 + 5$
$16 = 4 \times 4 = 1 + 3 + 5 + 7$
$25 = 5 \times 5 = 1 + 3 + 5 + 7 + 9$
.....
.....
.....

The teacher can further extend the given sequence as required.

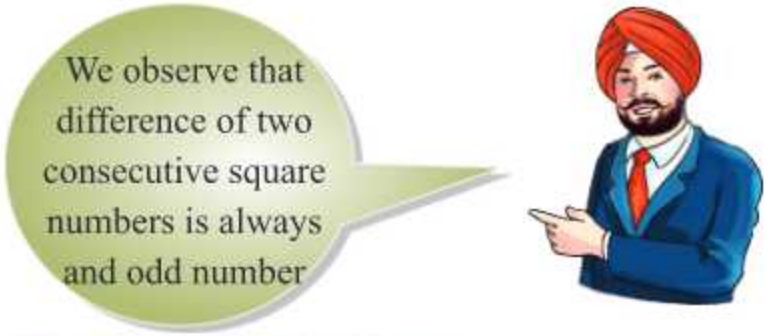
We can give some more examples related to Square Numbers and Odd Numbers.

$4 - 1 = 3$

$9 - 4 = 5$

$16 - 9 = 7$

$25 - 16 = 9$



11.5 Some more patterns/games based on Numbers :

$1 \times 8 + 1 = 9$	$111 \div 3 = 37$
$12 \times 8 + 2 = 98$	$222 \div 6 = 37$
$123 \times 8 + 3 = 987$	$333 \div 9 = 37$
$1234 \times 8 + 4 = 9876$	$444 \div 12 = 37$
$12345 \times 8 + 5 = 98765$	$555 \div 15 = 37$
.....	.....
.....	.....
.....	.....

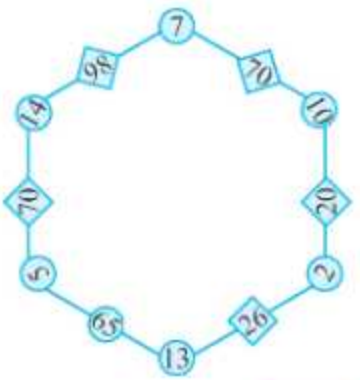
11.6 Magic Squares

Let us make a magic square.

Here we shall fill numbers 46 to 54 so that each row/column has sum total of 150.

53	48	49	= 150
46	50	54	= 150
51	52	47	= 150
= 150	= 150	= 150	

11.7 Magic Hexagon



Look at the number pattern in Hexagon. Every side has two circles and a square on it.

You will get the number in square by multiplying the numbers in both adjacent circles.

11.8 Magic Calendar

Look at the following calendar.

Make 3 × 3 squares (9 dates) in calander and see the magic.

Sun	Mon	Tues	Wed	Thur	Fri	Sat
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				

I shall add the numbers of this box.

It will take some time.

$$\begin{array}{r} 3 \\ +\ 10 \\ +\ 17 \\ \hline 30 \end{array} \qquad \begin{array}{r} 4 \\ +\ 11 \\ +\ 18 \\ \hline 33 \end{array}$$

I know an easy and quick method to solve it.

$$\begin{array}{r} 5 \\ +\ 12 \\ +\ 19 \\ \hline 36 \end{array} \qquad \begin{array}{r} 30 \\ +\ 33 \\ +\ 36 \\ \hline 99 \end{array}$$

What's that ?

If we multiply the number in centre with 9 we get an instant answer as 11 × 9 = 99.

Now you can verify this by taking any 3 × 3 (9 dates) box in the calendar.

11.9 We can make many patterns using numbers and letters. Some of them are given as under :

(a) ABC DEF GHI JKL MNO PQR

(b) 1A 2B 3C 4D 5E 6F

(c) 40Z, 39Y, 38X, 37W, 36V, 35U

(d) 108, 208, 308, 408, 508, 608

(e) 50, 65, 80, 95, 110, 125

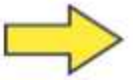
(f) 600, 550, 500, 450, 400, 350

(g) 100, 200, 300, 400, 500, 600

(h) 5M, 25N, 45O, 65P, 85Q, 105R

Exercise 11.1

1. Study the patterns carefully and fill the boxes.

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

2. See the given pattern and write the next two terms :

(a)
$(9 - 1) \div 8 = 1$
$(98 - 2) \div 8 = 12$
$(987 - 3) \div 8 = 123$
..... = ...
..... = ...

(b)
$9 \times 9 + 7 = 88$
$98 \times 9 + 6 = 888$
$987 \times 9 + 5 = 8888$
..... = ...
..... = ...

3. Make triangular patterns with the help of the following numbers :

(a) 15 (b) 21

4. Make dotted patterns using square numbers $5 \times 5 = 25$ and $6 \times 6 = 36$

5. Fill the numbers from 21 to 29 in such a manner in the given box that sum of rows/Columns is 75.

	25	

6. Fill the following hexagon in such a way that number which comes in square must be the multiplication of its adjoining two circles.

(a)

(b)

7. Look at these number series and complete the blanks.

(a) 6, 13, 20, ..., ..., ...
(b) 86, 80, 74, ..., ..., ...
(c) 1600, 800, 400, ..., ..., ...
(d) 28Z, 27Y, 26X, ..., ..., ...
(e) ED, FE, GF, ..., ..., ...
(f) 8, 108, 208, ..., ..., ...
(g) 2, 6, 18, ..., ..., ...
(h) 1, 8, 27, ..., ..., ...
(i) 729, 243, 81, ..., ..., ...

Answers

Exercise 11.1

2. (a) $(9876 - 4) \div 8 = 1234$

$(98765 - 5) \div 8 = 12345$

(b) $9876 \times 9 + 4 = 88888$

$98765 \times 9 + 3 = 888888$

3. (a)

$1 + 2 + 3 + 4 + 5 = 15$

(b)

$1 + 2 + 3 + 4 + 5 + 6 = 21$

4.

$5 \times 5 = 25$

$6 \times 6 = 36$

5.

28	21	26
23	25	27
24	29	22

7. (a) 27, 34, 41
(b) 68, 62, 56
(c) 200, 100, 50
(d) 25W, 24V, 23U
(e) HG, IH, JI
(f) 308, 408, 508
(g) 54, 162, 486
(h) 64, 125, 216
(i) 27, 9, 3

For the Preparation of Competitive Exams.

(Page No. 233 to 238 is not a part of Syllabus)

Percentage (%)

In mathematics a percentage is a number or ratio expressed as a fraction of 100 . It is often denoted using percentage sign "%"

For example: If Simarjit scored 93 out of 100 marks in the paper of, mathematics then it is written as 93%

Example 1 : Convert $\frac{4}{5}$ in percentage.

Solution : $\frac{4}{5} \times 100 = 80\%$

Example 2 : Convert 0.35 in percentage.

Solution : 0.35×100

$$= \frac{35}{100} \times 100$$

$$= 35\%$$

Example 3 : Surjeet had ₹ 800. She spent 90% of the amount. How much amount had she spent?

Solution : Surjeet had amount = ₹ 800

Percentage of amount spent = 90%

$$\text{Amount spent} = 800 \times \frac{90}{100}$$

$$= ₹\ 720$$

Example 4 : Geeta scored 450 marks out of 500 in her fifth class exam. How many marks did she score in percentage ?

Solution : Total marks = 500

Marks obtained = 450

$$\text{Percentage of marks} = \frac{450}{500} \times 100$$

$$= 90\%$$

Exercise M-1

1. **Convert into percentage :**

   (a) $\frac{3}{4}$ (b) $\frac{1}{2}$

   (c) 0.25 (d) 0.09

2. Paras scored 440 marks out of 500 in his fourth class exam . What is the percentage of marks did he score ?

3. Charan scored 45 marks out of 50 in his maths exam. What is the percentage of marks did he score ?

4. Mohinder had ₹ 900. He spent 60% of the amount. How much amount was left with him?

Profit-Loss

◆ When any shopkeeper starts his trade, he buys goods. The price at which any goods are bought is called the cost price. After buying those goods he sells them. The price at which goods are sold, is called the selling price.

◆ If he sells his goods at more price than the cost price, he earns profit. On the other hand if he sells his goods at lesser price than the cost price, he is at loss.

$$\text{Profit} = \text{Selling Price} - \text{Cost Price}$$

$$\text{Loss} = \text{Cost Price} - \text{Selling Price}$$

$$\text{Cost Price} = \text{Selling Price} - \text{Profit or}$$

$$= \text{Selling Price} + \text{Loss}$$

$$\text{Selling Price} = \text{Cost Price} + \text{Profit or}$$

$$= \text{Cost Price} - \text{Loss}$$

$$\text{Profit \%} = \frac{\text{Profit}}{\text{Cost Price}} \times 100$$

$$\text{Loss \%} = \frac{\text{Loss}}{\text{Cost Price}} \times 100$$

Example 1 : Fill in the blanks:

Solution : Selling price = ₹ 540, Cost price = ₹ 500, Profit = ₹ 40, Profit % = 8 %

Cost price = ₹ 350, Selling price = ₹ 385, Profit = ₹ 35, Profit = 10%

Cost price = ₹ 400, Selling price = ₹ 320, loss = ₹ 80, loss % = 20%

Profit = ₹ 80, Cost price = ₹ 350, Selling price = ₹ 430

Loss = ₹ 60, Selling price = ₹ 240, Cost price = ₹ 300

Example 2 : The cost price of an item is ₹ 400 and selling price ₹ 440. Find the profit and profit percentage?

Solution :

$$\begin{aligned}
\text{Cost price of an item} &= ₹\ 400\\
\text{Selling price of an item} &= ₹\ 440\\
\text{Profit} &= \text{Selling price} - \text{cost price}\\
&= 440 - 400\\
&= ₹\ 40\\
\text{Profit percentage} &= \frac{\text{Profit}}{\text{Cost Price}} \times 100\\
&= \frac{40}{400} \times 100\\
&= 10\%
\end{aligned}$$

Example 3 : The cost price of an item is ₹ 250 and selling price ₹ 225. Find the loss and loss percentage?

Solution :

$$\begin{aligned}
\text{Cost price of an item} &= ₹\ 250\\
\text{Selling price of an item} &= ₹\ 225\\
\text{Loss} &= \text{Cost price- Selling price}\\
&= 250 - 225\\
&= ₹\ 25\\
\text{Loss percentage} &= \frac{\text{Loss}}{\text{Cost Price}} \times 100\\
&= \frac{25}{250} \times 100\\
&= 10\%
\end{aligned}$$

Exercise M-2

1. Fill in the blanks:
   (a) Selling price = ₹ 240, Cost price = ₹ 210, Profit = ...
   (b) Cost price = ₹ 650, Selling price = ₹ 585, Loss = ... Loss % = ...
   (c) Cost price = ₹ 320, Selling price = ₹ 384, Profit = ... Profit % = ...
   (d) Profit = ₹ 40, Cost price = ₹ 550, Selling price = ...
   (e) Loss = ₹ 35, Selling price = ₹ 275, Cost price = ...
2. The cost price of an item is ₹ 300 and selling price ₹ 345. Find the profit and profit percentage?
3. The cost price of an item is ₹ 450 and selling price ₹ 405. Find the loss and loss percentage?
4. Sandeep bought a second hand scooter worth ₹ 8000. He paid ₹ 600 on its repair. He sold it for ₹ 9000. What is his profit or loss?

Average

Average is sum of numbers divided by the total numbers.

$$\text{Average} = \frac{\text{Sum of the Numbers}}{\text{Total Numbers}}$$

Example 1 : Find the average of 4,8,6,7 and 5

Solution : Sum of the numbers $= 4 + 8 + 6 + 7 + 5$

$= 30$

Total Numbers $= 5$

$$\text{Average} = \frac{\text{Sum of the numbers}}{\text{Total numbers}}$$

$$= \frac{30}{5}$$

$= 6$

Exercise M-3

1. Find the average of first 5 natural numbers.
2. Find the average of first 5 odd numbers.
3. Find the average of first 5 even numbers.
4. 7 students of 5th class scored 65, 60, 85, 70, 35, 80, 95 in maths. Find the average of their marks .
5. The height of 3 students of 5th class is 140 cm, 135 cm, 142 cm . Find their average height.

Simple Interest

Simple interest is the amount of interest which is in cured on a given amount of principal at fixed rate of interest for a fixed period of time. Simple interest is calculated as per the given formula.

$$\text{Simple Interest} = \frac{\text{Principal} \times \text{Rate} \times \text{Time}}{100}$$

Example 1 : Find the simple interest on the principal ₹ 500 at the rate of 8% for 3 years.

Solution : Principal = ₹ 500

Rate = 8% yearly

Time = 3 years

$$\text{Simple Interest} = \frac{\text{Principal} \times \text{Rate} \times \text{Time}}{100}$$

$$= \frac{500 \times 8 \times 3}{100}$$

$$= ₹\ 120$$

Exercise M-4

Find the simple interest of the following:

1. Find the Simple Interest of ₹ 800 at the rate of 6% per annum for 3 years.
2. Find the Simple Interest of ₹ 2500 at the rate of 10% per annum for 2 years.
3. Find the Simple Interest of ₹ 5000 at the rate of 4% per annum for 5 years.
4. Find the Simple Interest of ₹ 2000 at the rate of 12% per annum for 3 years.
5. Find the Simple Interest of ₹ 1500 at the rate of 4.5% per annum for 4 years.

Answers

(Exercice M-1)

1. (a) 75% (b) 50 % (c) 25 %
(d) 9%

2. 88 % **3.** 90 % **4.** ₹ 360

(Exercice M-2)

1. (a) ₹ 30 (b) ₹ 65, 10% (c) ₹ 64, 20%
(d) ₹ 590 (e) ₹ 310

2. ₹ 45, 15% **3.** ₹ 45, 10% **4.** ₹ 400

(Exercice M-3)

1. 3 **2.** 5 **3.** 6

4. 70 **5.** 139 cm

(Exercice M-4)

1. ₹ 108 **2.** ₹ 500 **3.** ₹ 1000

4. ₹ 720 **5.** ₹ 270