

Let us write:

A) The number of persons living in my ten neighbours

5, 6, 2, 6, 7, 3, 4, 6, 3, 12

B) The number of students reading in different classes in my school;

12, 10, 6, 23, 15, 21, 17, 8

C) The runs made a played in 8 different matches in a series

54, 60, 23, 0, 90, 121, 34, 50

The information written above in the form of numbers i.e. 5, 6, 2, 6, 7, 3, 4, 6, 3, 12 or 12, 10, 6, 23, 15, 21, 17, 8 or 54, 60, 23, 0, 90, 121, 34, 50, is called data.

Similarly, you can collect various data like;

a) Number of marks obtained in last examination by the students of your class.

b) Number of babies born annually in your village from last 10 years.

c) Number of tea (cups) served by a hotel during last week. Etc

Organisation of data:

The data written in first three examples is raw data. Let us organise it so that it can be read easily by anyone.

Number of people living in 7 families

FAMILY	PEOPLE LIVING
Family 1	5
Family 2	6
Family 3	2
Family 4	6
Family 5	7
Family 6	3
Family 7	4

Roll of classes in a school

CLASS	ROLL
8 th	12
7 th	10
6 th	7
5 th	23
4 th	15
3 rd	21
2 nd	17
1 st	8

Representative Value of the Data:

Suppose you have friend living in USA or else. He/she asks you the number of people living in Kashmiri families. Will you answer him the detail of each family?

No, you may tell him some number which can denote each family. The number

you may tell him, called the representative value of the data. There are three types of representative values of the data about we may learn here in this chapter. The

values are;

1. Mean (\bar{X})

2. Median (M)

3. Mode (Z)

Let us learn about these representative values one by one;

Mean (\bar{X})

The Arithmetic Mean (\bar{X}) is "central" value of a data (set of numbers). It is calculated by dividing the sum of data (observations) by number of observations.

Follow the solved example of mean to learn it easily;

Example 1:

Consider the data; 6, 3, 12, 10, 6, 23, 15, 21, 17, 8

Here the sum of observations is; $6 + 3 + 12 + 10 + 6 + 23 + 15 + 21 + 17 + 8 = 120$

And the number of observations is 10

Therefore, **Mean** (\bar{X}) of the data is: $\text{Sum of observations/No. of observations} = 120/10 = 12$

Example 2:

Consider the data; 2, 3, 2, 0, 6, 2, 1, 1, 7, 5

Here the sum of observations is; $2 + 3 + 2 + 0 + 6 + 2 + 1 + 1 + 7 + 5 = 30$

And the number of observations is 10

Therefore, **Mean** (\bar{X}) of the data is: $\text{Sum of observations/No. of observations} = 30/10 = 3$

Median (M)

It is the middle term of the data when arranged either in ascending or descending order. Follow the solved example of median to learn it easily;

Case I: When the number of terms is odd

Example 1:

Consider the data; 6, 3, 2, 10, 6, 7, 8, 9, 4, 5, 6, 6, 8, 2, 0

Ascending order of the data is; 0, 2, 2, 3, 4, 5, 6, 6, 6, 6, 7, 8, 8, 9, 10

The middle term of the data is; 6

Thus, the median of the data is 6

Example 2:

Consider the data; 2, 3, 2, 0, 6, 2, 1, 1, 7, 5, 1

Descending order of the data is; 7, 6, 5, 3, 2, 2, 2, 1, 1, 1, 0

Middle term of the data is; 2

Thus, the median of the data is 2

Case II: When the number of terms is even

Example 1:

Consider the data; 6, 3, 2, 10, 6, 7, 8, 9, 4, 5, 6, 8, 2, 0

Ascending order of the data is; 0, 2, 2, 3, 4, 5, 6, 6, 6, 7, 8, 8, 9, 10

The middle terms of the data are; 6, 6

Median is the mean of these terms; $6+6/2 = 12/2 = 6$

Example 2:

Consider the data; 2, 3, 3, 0, 6, 2, 1, 1, 7, 5

Descending order of the data is; 7, 6, 5, 3, 3, 2, 2, 1, 1, 0

Middle terms of the data are: 3, 2

Median is the mean of these two terms; $3+2/2 = 5/2 = 2.5$

Mode (Z)

It is the most occurring item in the data.

Follow the solved example of mode to learn it easily;

Example 1:

Consider the data; 6, 3, 2, 2, 6, 7, 2, 3, 4, 2, 5, 3, 8, 2, 0

Let us count each entry of the data and write it a tabular form;

Item 0 2 3 4 5 6 7 8

No. of times occur 1 5 3 1 1 2 1 1

Here, 2 is the item which occur most of the times, i.e. 5 times

Therefore, Mode (Z) = 2

Example 2:

Consider the data; 2, 3, 5, 3, 4, 6, 7, 9, 0, 1, 2, 3, 4, 2, 1, 3, 3, 6, 7, 9, 0, 3, 4, 2, 7, 6, 8, 0, 2, 3, 4, 5

Let us count each entry of the data and write it a tabular form;

Item 0 1 2 3 4 5 6 7 8 9

No. of times occur 3 2 5 7 4 2 3 3 1 2

Here, 3 is the item which occur most of the times, i.e. 7 times

Therefore, Mode (Z) = 3

Let us try these:

A) Ask your 10 friend the number of family members living in their homes and

write it in organised manner.

B) Calculate the mean and median of the observations found in (A).

C) Find the mean of the first 5 whole numbers. (hint: whole numbers: 0,1,2,3,4,5, 6, 7, 8, 9,10, ...)

D) Measure the height of each member of your family and write it in tabular form. Also find the mean height of the observations.

E) If you remember the runs made by a cricket player in some matches, write it.

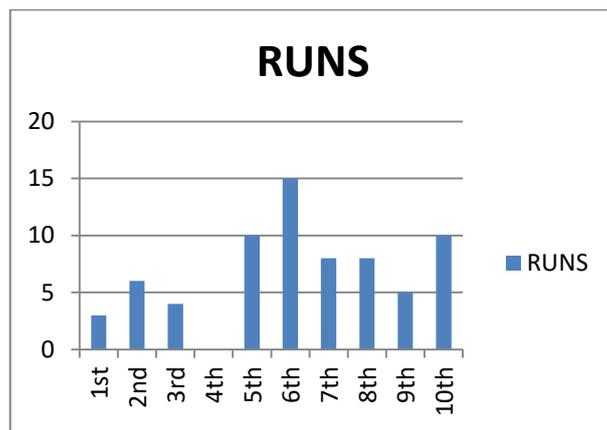
Bar-Chart

A chart used to represent the data visually so that it is easily understood by anyone is called Bar-Chart. To understand it, let us draw a Bar-Chart for the following data;

Runs made by different players of a team in a cricket match;

OVERS	RUNS
1 st	3
2 nd	6
3 rd	4
4 th	0
5 th	10
6 th	15
7 th	8
8 th	8
9 th	5
10 th	10

Representaion of the Data using Bar-Chart.



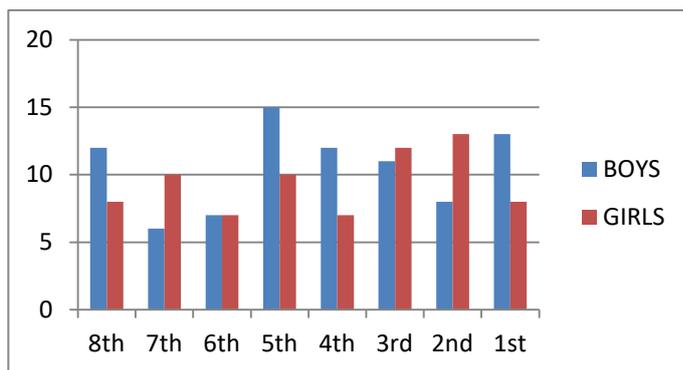
One can easily now observe;

- Maximum runs made in ... over.
- The least or no runs made in ... over.

Double Bar-Chart

Sometimes, we have two or more data in a category. E.g. Roll of a school (Class wise and Sex Wise) To represent such type of data, we use Double Bar-Chart. Class Boys Girls

CLASS	BOYS	GIRLS
8 th	12	8
7 th	6	10
6 th	7	7
5 th	15	10
4 th	12	7
3 rd	11	12
2 nd	8	13
1 st	13	8



Topic: Linear Equations

Read and understand the given statements;

- Three apples cost ₹10
- Two papayas and 2 kg weighs 5kg
- The length of two same trains is 400m
- Half of the height of a tree is 15m

We can write these statements in mathematical form as follows;

$3a = 10$ if 'a' represent apple

$2p + 2 = 5$ if 'p' represent papaya

$2t = 400$ if 't' train

$t/2 = 15$ if 't' represent height of tree

Thus, the above written mathematical statements i.e. $3a = 10$, $2p + 2 = 5$, $2t = 400$, and $t/2 = 15$ are called equations.

Variable: The English alphabet used in these equations are called variables or unknown. i.e. a , p , t used in these equations are variables.

Coefficient: The numeral used in these equations are called coefficients i.e. in $2x + 1 = 5$, 2, 1 & 5 are called the coefficients.

Solution of the equations;

Solution of the equation means to find the value of variable. i.e.

It $t/2 = 15 \Rightarrow t = 30$ (This means half of the height of a tree is 15m, then the height of tree is 30m)

Similarly, If $2x = 10 \Rightarrow x = 5$ (This means twice a number is 10, then the number is 5)

Let us learn to solve these equations formally;

Example 1.

$$x + 1 = 3$$

$\Rightarrow x = 3 - 1$ Transferring 1 from LHS to RHS, sign gets changed, i.e. + to -

$$\Rightarrow x = 2$$

Example 2.

$$x - 5 = 7$$

$\Rightarrow x = 7 + 5$ Transferring -5 from LHS to RHS, sign gets changed, i.e. - to +

$$\Rightarrow x = 12$$

Example 3.

$$2x = 8$$

$$\Rightarrow x = 8/2$$

Coefficient multiplying the variable in LHS gets divided to RHS when transferred $\Rightarrow x = 4$

Example 4.

$$x/2 = 7$$

$\Rightarrow x = 7 \times 2$ Coefficient dividing the variable in LHS gets multiplied to RHS when transferred

$$\Rightarrow x = 14$$

Example 5.

$$2x + 3 = 13$$

$\Rightarrow 2x = 13 - 3$ Transferring 3 from LHS to RHS, sign gets changed, i.e. + to - and - to +

$$\Rightarrow 2x = 10$$

$$\Rightarrow x = 10/2$$

Coefficient multiplying the variable in LHS gets divided to RHS when transferred

$$\Rightarrow x = 5$$

Example 6.

$$y/2 - 4 = 13$$

$\Rightarrow y/2 = 13 + 4$ Transferring 4 from LHS to RHS, sign gets changed, i.e. + to - and - to +

$$\Rightarrow y/2 = 17$$

$\Rightarrow y = 17 \times 2$ Coefficient dividing the variable in LHS gets multiplied to RHS when transferred

$$\Rightarrow y = 34$$

Try these equations for their solution;

(I) $y - 5 = 8$

(II) $z + 5 = 10$

(III) $2p = 8$

(IV) $3x + 5 = 7$

(V) $x/3 + 5 = -7$

(VI) $z - 7 = 0$

(VII) $z + 1 = 1$

(VIII) $p/3 - 5 = 7$

(IX) $3x + 1 = 0$

(X) $3x/2 + 7 = 7$