

# 9

## Data Handling



### Data

The word 'data' means useful information in the form of numerical figures. The collection of numbers that you gather to get some information is called data. 'Data' is plural of 'datum'.

E.g., In 6th class, there are 5 subjects i.e., English, Hindi, Mathematics, Science and Social Science. The number of students in the class are 30. Out of 30 only 10 students got distinction (75%) in all the subjects. The data of these students is given below.

Name of student	English	Hindi	Mathematics	Science	Social Science
Alka	8	9	8	8.5	9.5
Amrish	8	9	8	9	9
Amisha	7.5	10	9	8.5	8.5
Ronish	9	8.5	8	7.5	8
Renu	8	10	9	9	10
Ruchi	9	9.5	8	10	9
Hitesh	10	9	10	9	8.5
Sangeeta	9.5	8	10	9	8
Aman	8	7.5	9	8	8
Rupesh	9	8	10	9	9

The highest marks of the students in each subject is 10. In your day-to-day life, you may come across several kinds of such tables.

Each numerical fact is called observation.

**Recording Data :** If you are collecting information about favourite subject, one way you could record it is to write the name of students and then their favourite subject against their name.

Kishan – English	Shankar – Maths	Sampat – Hindi
Ram – S. St.	Riya – S. St.	Deepika – Science
Omi – Maths	Priya – Science	Ankita – Maths
Sanjay – Hindi	Vikas – S. St.	Ekta – Hindi
Manisha – Science	Samyak – English	Nitin – English
Janeev – S. St.	Savita – S. St.	Stuti – Hindi
Sangam – Maths	Mary – Maths	Prerna – English
Rajiv – Science	Rekha – English	Sushil – Maths
Suraj – English	Sunita – Hindi	

In this way of collecting data, you have to write the name of subject again and again and also write the name of all students. But if you have to collect the information of 300 students then this method is very lengthy.

So, a better and convenient way would be to write the name of the subject and put a tick mark against it and then add to get the number of students who like these subjects.

#### Subject Total

English	✓✓✓✓✓✓	6
Hindi	✓✓✓✓✓	5
S. St.	✓✓✓✓✓	5
Science	✓✓✓✓	4
Maths	✓✓✓✓✓✓	6



Do You

**Remember ?**



**SPOT LIGHT**

★ Observations collected initially are called raw data or primary data.

**Arrayed Data :** The data arranged in an ascending or descending order is called arrayed data.

**Primary Data :** Primary data is first hand information collected by the person himself.

**Secondary Data :** Secondary data is the information collected by someone else earlier.

## Organisation of Data with Tally marks

Tally marks are the representation of the data in the form of vertical lines. We put one vertical line ( | ) for each of the four counts, A diagonal line ( \ ) is put for the fifth count. These marks are tally marks.

i.e., one for each observation ( | ), are used to find the frequency of occurrence of an observation in the data, we use |||| for four and ||||| for five.

Suppose 16 students like English. You may record as under  
English |||||

or ||||| ||||| ||||| || (making groups of five)

$$5 + 5 + 5 + 1 = 16$$

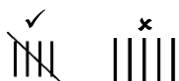
Thus, you can record the information about the favourite subjects, which you had collected as under:

Favourite subject	Tally marks	Number of students
English		6
Hindi		5
S. St.		5
Science		4
Maths		6



**Be Alert !**

- ★ In Tally marks, the 5<sup>th</sup> line is always drawn across the four vertical lines.



**Building  
Concepts**

1






In a company, there is a strength of 30 members. These 30 members like different colours which are Blue, White, Red, Green, Black, Blue, Blue, White, Green, White, Black, Red, Red, Blue, Red, Black, Green, White, Green, Black, Red, Blue, White, Green, Black, Black, Green, White, Black, Green. Prepare a table and enter the data using tally marks.



The number of times an observation is repeated is called its frequency.

**SPOT LIGHT**




## Explanation

Colours	Tally marks	Number of times (frequency)
Black		7
Blue		5
Red		5
Green		7
White		6




## Pictograph

A pictograph or picture graph uses pictures or symbols to show data.

E.g., In a school compound, there are 5 neem trees, 4 coconut trees and 3 Ashoka trees. Let us represent the above data by a pictograph.

Types of trees	Trees
Neem trees	
Coconut trees	
Ashoka trees	

In a park, there are 40 neem trees, 24 coconut trees and 32 Ashoka trees, you cannot draw each picture for each tree. So, we take a convenient scale. Let us consider that each tree drawn represents 8 actual trees, So 40 neem trees will become 5 trees drawn. Similarly, 24 coconut trees will be 3 and 32 Ashoka trees will be represented by 4 trees. Now, it is convenient to draw a pictograph.

Types of trees	Trees
Neem trees	
Coconut trees	
Ashoka trees	

Key : 1 tree picture = 8 trees



Pictographs are often used by newspaper and magazines to attract readers attention and give information.

SPOT LIGHT



Make sure that each picture must be one below the other. Here, we have a traffic survey on 03-03-2021 from 9 : 00 A.M. – 9 : 30 A.M.

Vehicles	Frequency
Trucks	17
Cars	33
Rickshaws	24
Motor cycles	36
Cycles	32

### Explanation

Let us represent this data by a pictograph. We cannot draw so many pictures. So, we take a convenient scale as 1 picture = 5 vehicles

So, 17 trucks =  $3\frac{1}{2}$  pictures (approximately)

33 cars =  $6\frac{1}{2}$  pictures (approximately)

24 rickshaws = 5 pictures (approximately)

36 motor cycles = 7 pictures (approximately)

32 cycles =  $6\frac{1}{2}$  pictures (approximately)

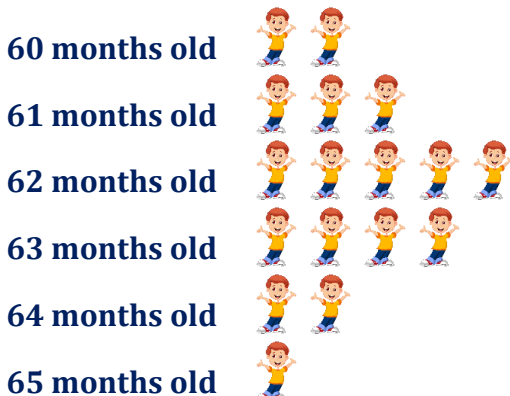
Now, let us represent this information by a pictograph.

Vehicles	Frequency
Trucks	○○○½
Cars	○○○○○○½
Rickshaws	○○○○○
Motor cycles	○○○○○○○
Cycles	○○○○○○½



Given below is a pictograph of ages of students in a class of 51 students.

Key : represents 3 students.



Answer the following questions.

- (i) What is the total number of students?
- (ii) Which age has the lowest number of students? How many students are there in that age?
- (iii) Which age has the highest number of students? How many students are there in that age?
- (iv) How many students are there, who are 62 months old or less?
- (v) How many students are 62 months old or more?
- (vi) How many students are between the age of 61 months and 64 months?

**Explanation**

$$60 \text{ months old} = 2 \times 3 = 6$$

$$61 \text{ months old} = 3 \times 3 = 9$$

$$62 \text{ months old} = 5 \times 3 = 15$$

$$63 \text{ months old} = 4 \times 3 = 12$$

$$64 \text{ months old} = 2 \times 3 = 6$$

$$65 \text{ months old} = 1 \times 3 = 3$$

$$(i) \text{ Total number of students} = 6 + 9 + 15 + 12 + 6 + 3 = 51$$

Or

$$\text{Total 17 symbols} = 17 \times 3 = 51 \text{ students}$$

$$(ii) \text{ 65 months old,}$$

$$1 \text{ symbol} \Rightarrow 3 \text{ students}$$

$$(iii) \text{ 62 months old,}$$

$$5 \text{ symbols} \Rightarrow 15 \text{ students}$$

$$(iv) \text{ 10 symbols (60 months - 2 symbols, 61 months - 3 symbols, 62 months - 5 symbols)}$$

$$\Rightarrow 10 \times 3 = 30 \text{ students}$$

$$(v) \text{ 12 symbols (62 months - 5 symbols, 63 months - 4 symbols, 64 months - 2 symbols, 65 months - 1 symbol)}$$

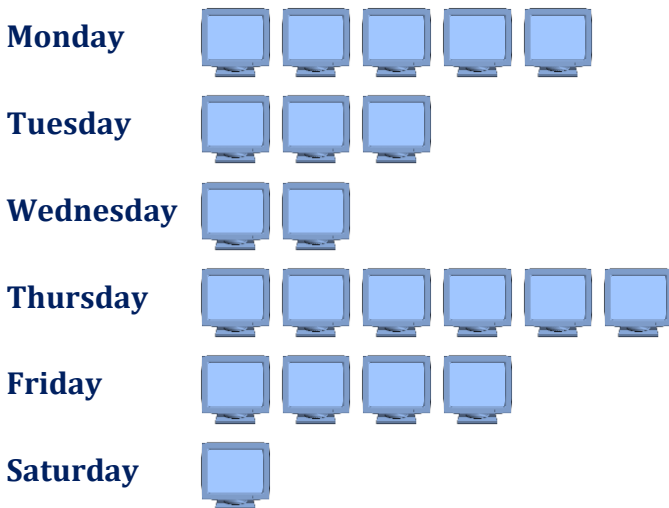
$$\Rightarrow 12 \times 3 = 36 \text{ students}$$

$$(vi) \text{ 9 symbols (62 months - 5 symbols, 63 months - 4 symbols)} \Rightarrow 9 \times 3 = 27 \text{ students}$$



The following pictograph shows the number of computers sold by a company during a week.

The scale used :  = 6 computers



Look at the pictograph and answer the following questions.

- How many computers were sold on Friday ?
- How many computers were sold on Monday ?
- How many computers were sold during the week ?
- On which day was the sale maximum ?


**Solution**

- Number of computers sold on Friday =  $(4 \times 6) = 24$
- Number of computers sold on Monday =  $(5 \times 6) = 30$
- Number of computers sold during the week =  $(21 \times 6) = 126$
- Clearly, the sale was maximum on Thursday i.e.,  $6 \times 6 = 36$  computers were sold on Thursday.



The number of fans sold by a shopkeeper during 6 months are given below

Month	March	April	May	June	July	August
Number of fans sold	30	40	60	50	20	30

Taking the scale  = 10 fans sold, draw the pictograph.



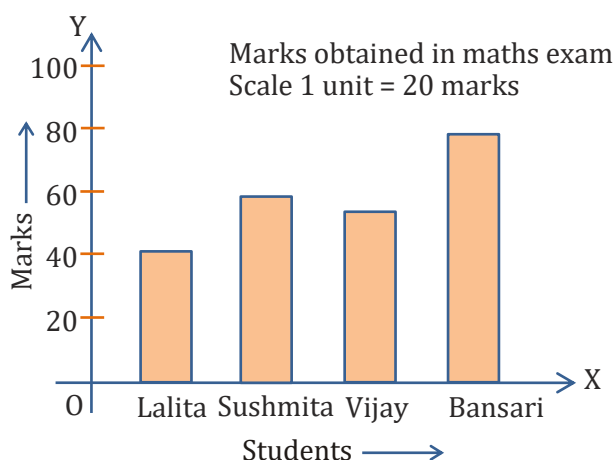
### Do You Remember ?

- ★ Bar graphs are 2-dimensional.

### Bar graph (or column graph)

A bar graph is a pictorial representation of numerical data in the form of rectangles (or bars) of equal width and varying heights. When the given data is large and also not in multiples of a number, it is difficult to draw pictographs. A bar graph can represent any numerical data effectively. The bar graph is also known as column graph.

E.g. In a maths exam, the marks of 4 students Lalita, Sushmita, Vijay and Bansari are 40, 60, 55 and 80 respectively. It can be represented in the bar graph as shown below.



Choosing a scale is very important while drawing a bar graph and pictograph.

SPOT LIGHT

### Properties of a bar graph

In a bar graph, the columns are drawn such that

- Each column is of equal width.
- There is an equal space between every two columns.
- The height of each column indicates the value of data (such that if a vertical bar is drawn from its bottom to ray OY), the marks represented by the column can be read off.
- All bars or columns are drawn on the same common base i.e., on OX or OY.
- To make the bar graph attractive, the bars may be coloured.
- Bars are very helpful for visual comparison of data.

### Axes and scale in bar graph

We first draw two lines OX and OY perpendicular to each other and intersecting at point O. The lines are termed as axis and line OX is called the X-axis along which columns representing the quantities are drawn. The line OY is called the Y-axis against which the numerical values of the items are read off.

Sometimes the numerical values of items may be so large that it may not be possible to represent them by exact length of columns. In such a case, the length of a column is scaled down in direct proportion to the measures of the numerical values.





**Be Alert !**

### In a Bar graph

- ★ Always give a title to the graph.
- ★ Always mark scale.



**Building**

**Concepts**

**4**

Look at the frequency chart representing the number of tourists staying in Hotel Raj Mahal in Shimla for 5 months : March, April, May, June and July. Construct a bar graph.

**Months    Number of Tourists**

**March    120**

**April    180**

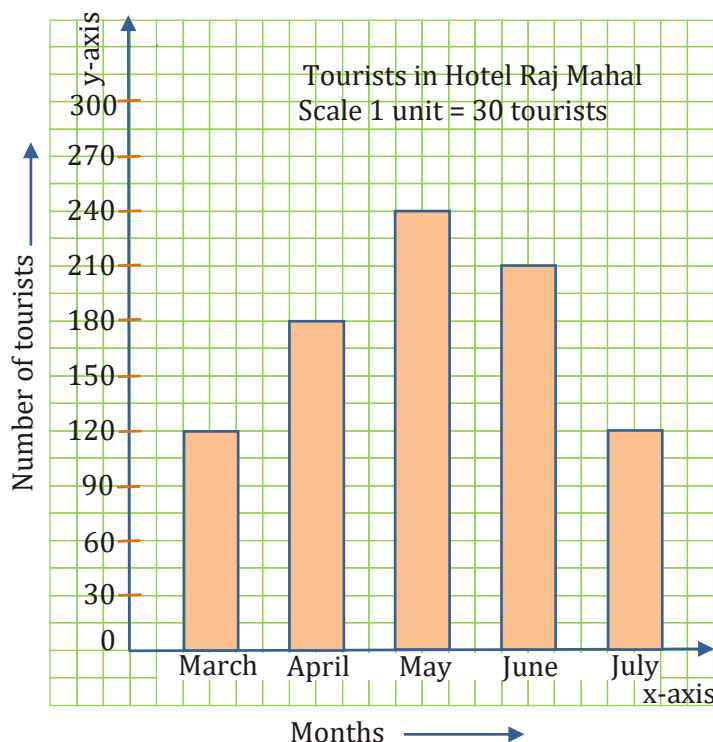
**May    240**

**June    210**

**July    120**

### Explanation

Take a graph paper or a squared paper. Draw a horizontal axis at the bottom. On the left side draw a vertical axis. Take an appropriate scale. In this case, let it be 1 division (1 centimetre) equal to 30 tourists.

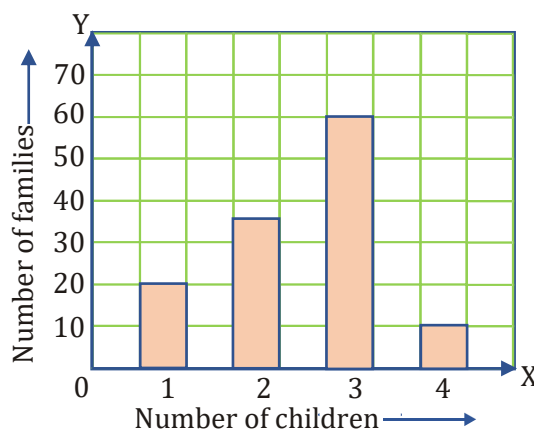


On the horizontal axis, represent the five months separately with equal width and equal distances between them.



In a survey of 130 families of a colony, the number of children in each family was recorded and the data has been represented by the bar graph given below.

Scale 1 unit = 10 families



Read the bar graph carefully and answer the following questions :

- What information does the bar graph give ?
- How many families have 2 children ?
- How many families have no child ?
- What percentage of families have 4 children ?

#### Solution

- The given bar graph shows the number of families having 1, 2, 3 or 4 children.
- Clearly, 35 families have 2 children each.
- Number of families having no child =  $130 - (\text{Number of families having 1, 2, 3 \& 4 children})$   
 $= 130 - (20 + 35 + 60 + 10) = 130 - 125 = 5$  families
- Percentage of families having 4 children

$$= \frac{\text{Number of families having 4 children}}{\text{Total no. of families}} \times 100\% = \frac{10}{130} \times 100 = 7.692\%$$



























- ★ Vertical bar graph is also called Column graph.
- ★ Horizontal bar graph is also called Row graph.



Check your  
Answers

1

Months	Number of fans [  = 10 fans ]
March	  
April	   
May	     
June	    
July	 
August	  

## Memory Map



## Data

The word 'data' means useful information in the form of numerical figures. The collection of numbers that you gather to get some information is called data.

## Types of data

## Arrayed Data

The data arranged in an ascending or descending order is called arrayed data.

## Primary data

Data collected from an original source.

## Secondary data

Secondary data is the information collected by someone else earlier.

## Recording data













If you are collecting information about favourite subject, one way you could record it as to write the name of students and then their favourite subject against their name.

## Organisation of data

Suppose 16 students like English.

English      |||||  
or              |||||

## Pictograph

Neem trees	    
Coconut trees	   
Ashoka trees	  

## Bar graph (or column graph)

