Data Handling

Chapter 9

9.1 Introduction

You must have observed your teacher recording the attendance of students in your class everyday, or recording marks obtained by you after every test or examination. Similarly, you must have also seen a cricket score board. Two score boards have been illustrated here :

Name of the bowlers	Overs	Maiden overs	Runs given	Wickets taken
A	10	2	40	3
B	10	1	30	2
C	10	2	20	1
D	10	1	50	4

Name of the batsmen	Runs	Balls faced	Time (in min.)
E	45	62	75
F	55	70	81
G	37	53	67
H	22	41	55

You know that in a game of cricket the information recorded is not simply about who won and who lost. In the score board, you will also find some equally important information about the game. For instance, you may find out the time taken and number of balls faced by the highest run-scorer.

Similarly, in your day to day life, you must have seen several kinds of tables consisting of numbers, figures, names etc.

These tables provide 'Data'. *A data is a collection of numbers gathered to give some information.*

9.2 Recording Data

Let us take an example of a class which is preparing to go for a picnic. The teacher asked the students to give their choice of fruits out of banana, apple, orange or guava. Uma is asked to prepare the list. She prepared a list of all the children and wrote the choice of fruit against each name. This list would help the teacher to distribute fruits according to the choice.

Raghav	—	Banana	Bhawana	—	Apple
Preeti	—	Apple	Manoj	—	Banana
Amar	—	Guava	Donald	—	Apple
Fatima	—	Orange	Maria	—	Banana
Amita	—	Apple	Uma	—	Orange
Raman	—	Banana	Akhtar	—	Guava
Radha	—	Orange	Ritu	—	Apple
Farida	—	Guava	Salma	—	Banana
Anuradha	—	Banana	Kavita	—	Guava
Rati	—	Banana	Javed	—	Banana

If the teacher wants to know the number of bananas required for the class, she has to read the names in the list one by one and count the total number of bananas required. To know the number of apples, guavas and oranges separately she has to repeat the same process for each of these fruits. How tedious and time consuming it is! It might become more tedious if the list has, say, 50 students.

Banana

So, Uma writes only the names of these fruits one by one like, banana, apple, guava, orange, apple, banana, orange, guava, banana, banana, apple, banana, apple, banana, orange, guava, apple, banana, guava, banana.

Orange

Do you think this makes the teacher's work easier? She still has to count the fruits in the list one by one as she did earlier.

Salma has another idea. She makes four squares on the floor. Every square is kept for fruit of one kind only. She asks the students to put one pebble in the square which matches their

Apple

choices. i.e. a student opting for banana will put a pebble in the square marked for banana and so on.

Guava

By counting the pebbles in each square, Salma can quickly tell the number of each kind of fruit required. She can get the required information quickly by systematically placing the pebbles in different squares.

Try to perform this activity for 40 students and with names of any four fruits. Instead of pebbles you can also use bottle caps or some other tokens.

9.3 Organisation of Data

To get the same information which Salma got, Ronald needs only a pen and a paper. He does not need pebbles. He also does not ask students to come and place the pebbles. He prepares the following table.

Banana	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	8
Orange	✓ ✓ ✓	3
Apple	✓ ✓ ✓ ✓ ✓	5
Guava	✓ ✓ ✓ ✓	4

Do you understand Ronald's table?

What does one (✓) mark indicate?

Four students preferred guava. How many (✓) marks are there against guava?

How many students were there in the class? Find all this information.

Discuss about these methods. Which is the best? Why? Which method is more useful when information from a much larger data is required?

Example 1 : A teacher wants to know the choice of food of each student as part of the mid-day meal programme. The teacher assigns the task of collecting this information to Maria. Maria does so using a paper and a pencil. After arranging the choices in a column, she puts against a choice of food one (|) mark for every student making that choice.

Choice	Number of students
Rice only	|||||||||||||||||
Chapati only	||||||||||||
Both rice and chapati	||||||||||||||||||||

Umesh, after seeing the table suggested a better method to count the students. He asked Maria to organise the marks (|) in a group of ten as shown below :

Choice	Tally marks	Number of students
Rice only	|||||||||| |||||||	17
Chapati only	|||||||||| |||	13
Both rice and chapati	|||||||||| ||||||||||	20

Rajan made it simpler by asking her to make groups of five instead of ten, as shown below :

Choice	Tally marks	Number of students
Rice only	||||| ||||| ||||| ||	17
Chapati only	||||| ||||| |||	13
Both rice and chapati	||||| ||||| ||||| |||||	20

Teacher suggested that the fifth mark in a group of five marks should be used as a cross, as shown by '𝍸'. These are **tally marks**. Thus, 𝍸 || shows the count to be five plus two (i.e. seven) and 𝍸 𝍸 shows five plus five (i.e. ten).

With this, the table looks like :

Choice	Tally marks	Number of students
Rice only	𝍸 𝍸 𝍸 ||	17
Chapati only	𝍸 𝍸 |||	13
Both rice and chapati	𝍸 𝍸 𝍸 𝍸	20

Example 2 : Ekta is asked to collect data for size of shoes of students in her Class VI. Her finding are recorded in the manner shown below :

5	4	7	5	6	7	6	5	6	6	5
4	5	6	8	7	4	6	5	6	4	6
5	7	6	7	5	7	6	4	8	7	

Javed wanted to know (i) the size of shoes worn by the maximum number of students. (ii) the size of shoes worn by the minimum number of students. Can you find this information?

Ekta prepared a table using tally marks.

Shoe size	Tally marks	Number of students
4	𝍸	5
5	𝍸 | | |	8
6	𝍸 𝍸	10
7	𝍸 | |	7
8	| |	2

Now the questions asked earlier could be answered easily.

You may also do some such activity in your class using tally marks.

Do This

1. Collect information regarding the number of family members of your classmates and represent it in the form of a table. Find to which category most students belong.

Number of family members	Tally marks	Number of students with that many family members

Make a table and enter the data using tally marks. Find the number that appeared

(a) the minimum number of times? (b) the maximum number of times?

(c) same number of times?

9.4 Pictograph

A cupboard has five compartments. In each compartment a row of books is arranged.

The details are indicated in the adjoining table :

Rows	Number of books	- 1 Book
Row 1		
Row 2		
Row 3		
Row 4		
Row 5		

Which row has the greatest number of books? Which row has the least number of books? Is there any row which does not have books?

You can answer these questions by just studying the diagram. The picture visually helps you to understand the data. It is a **pictograph**.

A pictograph represents data through pictures of objects. It helps answer the questions on the data at a glance.

Do This

Pictographs are often used by dailies and magazines to attract readers attention.

Collect one or two such published pictographs and display them in your class. Try to understand what they say.

It requires some practice to understand the information given by a pictograph.

9.5 Interpretation of a Pictograph

Example 3 : The following pictograph shows the number of absentees in a class of 30 students during the previous week :

Days	Number of absentees (- 1 Absentee)
Monday	5
Tuesday	4
Wednesday	2
Thursday	0
Friday	1
Saturday	8

(a) On which day were the maximum number of students absent?

(b) Which day had full attendance?

(c) What was the total number of absentees in that week?

Solution : (a) Maximum absentees were on saturday. (There are 8 pictures in the row for saturday; on all other days, the number of pictures are less).

(b) Against thursday, there is no picture, i.e. no one is absent. Thus, on that day the class had full attendance.

(c) There are 20 pictures in all. So, the total number of absentees in that week was 20.

Example 4 : The colours of fridges preferred by people living in a locality are shown by the following pictograph :

Colours	Number of people	- 10 People
Blue		
Green		
Red		
White		

(a) Find the number of people preferring blue colour.

(b) How many people liked red colour?

Solution : (a) Blue colour is preferred by 50 people.

[= 10, so 5 pictures indicate 5 × 10 people].

(b) Deciding the number of people liking red colour needs more care.

For 5 complete pictures, we get 5 × 10 = 50 people.

For the last incomplete picture, we may roughly take it as 5.

So, number of people preferring red colour is nearly 55.

Think, discuss and write

In the above example, the number of people who like red colour was taken as 50 + 5. If your friend wishes to take it as 50 + 8, is it acceptable?

Example 5 : A survey was carried out on 30 students of class VI in a school. Data about the different modes of transport used by them to travel to school was displayed as pictograph.

What can you conclude from the pictograph?

Modes of travelling	Number of students	- 1 Student
Private car		
Public bus		
School bus		
Cycle		
Walking		

Solution : From the pictograph we find that:

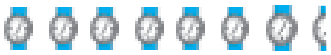
(a) The number of students coming by private car is 4.

(b) Maximum number of students use the school bus. This is the most popular way.

(c) Cycle is used by only three students.

(d) The number of students using the other modes can be similarly found.

Example 6 : Following is the pictograph of the number of wrist watches manufactured by a factory in a particular week.

Days	Number of wrist watches manufactured — ⌚ - 100 Wrist watches
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	

(a) On which day were the least number of wrist watches manufactured?

(b) On which day were the maximum number of wrist watches manufactured?

(c) Find out the approximate number of wrist watches manufactured in the particular week?

Solution : We can complete the following table and find the answers.

Days	Number of wrist watches manufactured
Monday	600
Tuesday	More than 700 and less than 800
Wednesday	.....
Thursday	.....
Friday	.....
Saturday	.....

EXERCISE 9.1

1. In a Mathematics test, the following marks were obtained by 40 students. Arrange these marks in a table using tally marks.

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

   (a) Find how many students obtained marks equal to or more than 7.

   (b) How many students obtained marks below 4?

2. Following is the choice of sweets of 30 students of Class VI.

   Ladoo, Barfi, Ladoo, Jalebi, Ladoo, Rasgulla, Jalebi, Ladoo, Barfi, Rasgulla, Ladoo, Jalebi, Jalebi, Rasgulla, Ladoo, Rasgulla, Jalebi, Ladoo, Rasgulla, Ladoo, Ladoo, Barfi, Rasgulla, Rasgulla, Jalebi, Rasgulla, Ladoo, Rasgulla, Jalebi, Ladoo.

   (a) Arrange the names of sweets in a table using tally marks.

   (b) Which sweet is preferred by most of the students?

3. Catherine threw a dice 40 times and noted the number appearing each time as shown below :

1	3	5	6	6	3	5	4	1	6
2	5	3	4	6	1	5	5	6	1
1	2	2	3	5	2	4	5	5	6
5	1	6	2	3	5	2	4	1	5

   Make a table and enter the data using tally marks. Find the number that appeared.

   (a) The minimum number of times (b) The maximum number of times

   (c) Find those numbers that appear an equal number of times.

4. Following pictograph shows the number of tractors in five villages.

Viilages	Number of tractors	- 1 Tractor
Village A		
Village B		
Village C		
Village D		
Village E		

Observe the pictograph and answer the following questions.

(i) Which village has the minimum number of tractors?

(ii) Which village has the maximum number of tractors?

(iii) How many more tractors village C has as compared to village B.

(iv) What is the total number of tractors in all the five villages?

5. The number of girl students in each class of a co-educational middle school is depicted by the pictograph :

Classes	Number of girl students	- 4 Girls
I		
II		
III		
IV		
V		
VI		
VII		
VIII		

Observe this pictograph and answer the following questions :

(a) Which class has the minimum number of girl students?

(b) Is the number of girls in Class VI less than the number of girls in Class V?

(c) How many girls are there in Class VII?

6. The sale of electric bulbs on different days of a week is shown below :

Days	Number of electric bulbs	- 2 Bulbs
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		
Saturday		
Sunday		

Observe the pictograph and answer the following questions :

(a) How many bulbs were sold on Friday?
(b) On which day were the maximum number of bulbs sold?
(c) On which of the days same number of bulbs were sold?
(d) On which of the days minimum number of bulbs were sold?
(e) If one big carton can hold 9 bulbs. How many cartons were needed in the given week?

7. In a village six fruit merchants sold the following number of fruit baskets in a particular season :

Name of fruit merchants	Number of fruit baskets - 100 Fruit baskets
Rahim	
Lakhanpal	
Anwar	
Martin	
Ranjit Singh	
Joseph	

Observe this pictograph and answer the following questions :

(a) Which merchant sold the maximum number of baskets?
(b) How many fruit baskets were sold by Anwar?
(c) The merchants who have sold 600 or more number of baskets are planning to buy a godown for the next season. Can you name them?

What have we discussed?

1. We have seen that data is a collection of numbers gathered to give some information.
2. To get a particular information from the given data quickly, the data can be arranged in a tabular form using tally marks.