

Understanding the Lesson

Data

Recording data

Organisation of data

Primary and secondary data

Arranging data in tabular form using tally marks.

Representing the data by pictograph.

Representing the data by bar graph.

Horizontal and vertical bar graph.

Conceptual Facts

Data: A data is a collections of numbers gathered to give some information.

Primary data: When the data are collected directly from the source.

Secondary data: When the data are collected from secondary source, e.g., newspapers, magazines, televisions, internet, etc.

Tally marks are used to organise the data in a group of five such as |||| .

Pictograph represents data through pictures of the objects.

Bar graphs are another way of representing the data visually bars of uniform width can be horizontal and vertical with equal spacing.

We have to choose the scale for drawing the Bar graphs and pictograph conveniently.

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?

Sol. From the given data, we have the following table.

Marks obtained	Tally marks	Number of students
1		2
2		3
3		3
4		4
5		4
6		4
7		4
8		4
9		3
Total		40

(a) Number of students who obtained marks equal to or more than 7 = $5 + 4 + 3 = 12$

(b) Number of students who obtained marks below 4 = $2 + 3 + 3 = 8$.

- Q2. 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.

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

Which sweet is preferred by most of the students?

- Sol. (a) We have the following table:

Sweets	Tally marks	Number of students
Ladoo		11
Barfi		3
Jalebi		7
Rasgulla		9
Total		30

- (b) Ladoo is preferred by most of the students, i.e., 11 students.

- Q3. 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
 (d) Find those numbers that appear an equal number of times.







- Sol. We have the following table:

Number on the dice	Tally marks	Number of times
1		7
2		6
3		5
4		4
5		11
6		7

From the above table, we get

- (a) The number 4 appeared 4 times which is the minimum.
 (b) The number 5 appeared 11 times which is the maximum.
 (c) The number 1 and 6 appear for the same number of times, i.e., 7.

- Q4. Following pictograph shows the number of tractors in five villages.

Villages	Number of Tractors	 = 1 Tractor
Village A	3	
Village B	5	
Village C	8	
Village D	3	
Village E	5	










Observe the pictograph and answer the following questions.

- (a) Which village has the minimum number of tractors?
 (b) Which village has the maximum number of tractors?
 (c) How many more tractors village C has as compared to village B?
 (d) What is the total number of tractors in all the five villages?

- Sol. From the given pictograph, we have

- (a) Village D has the minimum number of tractors, i.e., 3.
 (b) Village C has the maximum number of tractors, i.e., 8.
 (c) Village C has 3 tractors more than that of the village B.
 (d) Total number of tractors in all the villages is 28.

- Q5. 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	6	
II	5	
III	5	
IV	4	
V	3	
VI	4	
VII	3	
VIII	2	

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?







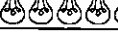
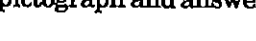
Sol. (a) Class VIII has the minimum number of girl students, i.e., $1\frac{1}{2} \times 4 = 6$.

(b) No, number of girls in Class VI = $4 \times 4 = 16$ and number of girls in Class V = $2\frac{1}{2} \times 4 = 10$

So, number of girl students in Class VI is not less than that of in Class V.

(c) Number of girls in Class VII = $3 \times 4 = 12$

Q6. 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?

EXERCISE 9.2








Q1. Total number of animals in five villages are as follows:

Village A : 80 Village B : 120
 Village C : 90 Village D : 40
 Village E : 60

Prepare a pictograph of these animals using one symbol \otimes to represent 10 animals and answer the following questions:

- Sol. (a) Number of bulbs sold on Friday = $7 \times 2 = 14$
 (b) On Sunday, the number of bulbs sold = $9 \times 2 = 18$ which is maximum in number.
 (c) On Wednesday and Saturday, the same number of bulbs were sold, i.e., $4 \times 2 = 8$
 (d) The minimum number of bulbs were sold on Wednesday and Saturday, i.e., $4 \times 2 = 8$
 (e) Total number of bulbs sold in a week = 43
 \therefore Number of cartons needed
 = $(43 \times 2) \div 9 = 86 \div 9 = 9\frac{5}{9} = 10$ cartons.

Q7. 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?

- Sol. (a) Martin sold the maximum number of fruit baskets, i.e., $9\frac{1}{2} \times 100 = 950$
 (c) Number of fruit baskets sold by Anwar is $7 \times 100 = 700$.
 (c) Anwar, Martin and Ranjit Singh have sold 600 or more fruit baskets and planning to buy a godown.

- (a) How many symbols represent animals of village E?
 (b) Which village has the maximum number of animals?
 (c) Which village has more animals: village A or village C?

Sol. From the given information, we have

Villages	Number of animals	⊗ = 10 animals
A	⊗⊗⊗⊗⊗⊗⊗⊗	
B	⊗⊗⊗⊗⊗⊗⊗⊗⊗⊗⊗⊗⊗⊗	
C	⊗⊗⊗⊗⊗⊗⊗⊗⊗	
D	⊗⊗⊗⊗	
E	⊗⊗⊗⊗⊗⊗	

- (a) Six symbols are used to represent the number of animals in village E.
 (b) Village B has the maximum number of animals, i.e., 120.
 (c) Village C has the more number of animals.

Q2. Total number of students of a school in different years is shown in the following table:

Years	Number of students
1996	400
1998	535
2000	472
2002	600
2004	623

- A. Prepare a pictograph of students using one symbol ♀ to represent 100 students and answer the following questions:
 (a) How many symbols represent total number of students in the year 2002?

(b) How many symbols represent total number of students for the year 1998?

B. Prepare another pictograph of students using any other symbol each representing 50 students. Which pictograph do you find more informative?

Sol. A. From the given information, we have

Year	Number of students	♀ = 100 students
1996	400	♀ ♀ ♀ ♀
1998	535	♀ ♀ ♀ ♀ ♀ ♀ $\frac{1}{2}$
2000	472	♀ ♀ ♀ ♀ ♀ $\frac{1}{2}$
2002	600	♀ ♀ ♀ ♀ ♀ ♀ ♀
2004	623	♀ ♀ ♀ ♀ ♀ ♀ ♀ $\frac{1}{2}$

- (a) Six symbols represent the total number of students in the year 2002.
 (b) 5 complete and 1 incomplete symbols represent total number of students for the year 1998.

B.

Year	Number of Students	♀ = 50 students
1996	400	♀ ♀ ♀ ♀ ♀ ♀ ♀ ♀
1998	535	♀ ♀ ♀ ♀ ♀ ♀ ♀ ♀ ♀ ♀ $\frac{1}{2}$
2000	472	♀ ♀ ♀ ♀ ♀ ♀ ♀ ♀ $\frac{1}{2}$
2002	600	♀ ♀ ♀ ♀ ♀ ♀ ♀ ♀ ♀ ♀ ♀ ♀
2004	623	♀ ♀ ♀ ♀ ♀ ♀ ♀ ♀ ♀ ♀ ♀ ♀ $\frac{1}{2}$

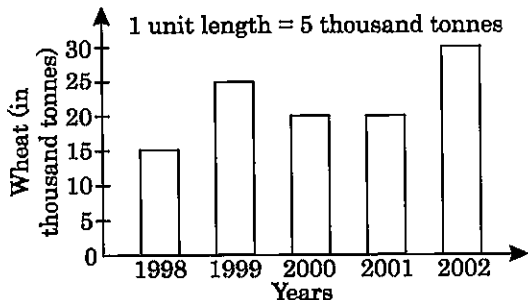
Pictograph (B) is more informative.

EXERCISE 16

Q1. The bar graph given below shows the amount of wheat purchased by government during the year 1998-2002.

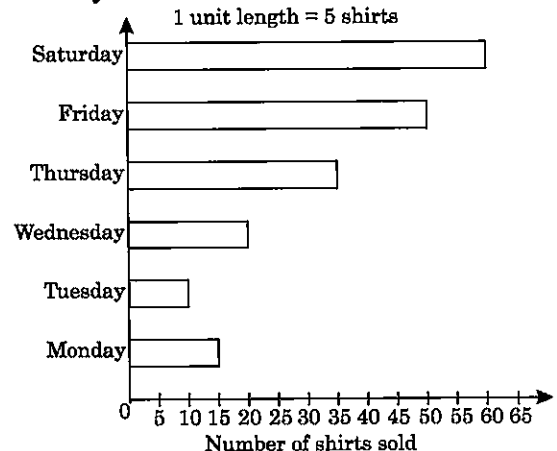
Read the bar graph and write down your observations. In which year was

- (a) the wheat production maximum?
 (b) the wheat production minimum?



- Sol. (a) In the year of 2002, the wheat production was maximum.
 (b) In the year of 1998, the wheat production was minimum.

Q2. Observe this bar graph which is showing the sale of shirts in a ready-made shop from Monday to Saturday.



Now answer the following questions:

- (a) What information does the above bar graph give?

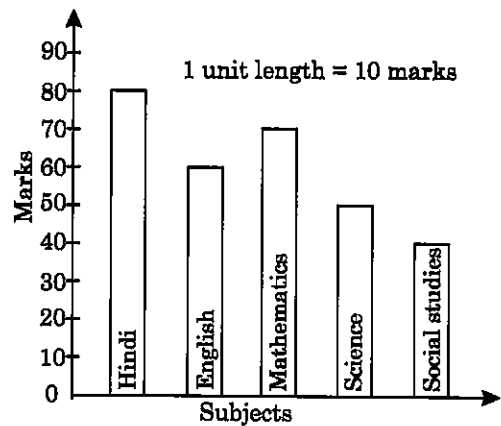
- (b) What is the scale chosen on the horizontal line representing number of shirts?
- (c) On which day were the maximum number of shirts sold? How many shirts were sold on that day?
- (d) On which day were the minimum number of shirts sold?
- (e) How many shirts were sold on Thursday?

- Sol. (a) The given bar graph shows the sale of shirts in a ready-made shop from Monday to Saturday.
- (b) 1 unit length = 5 shirts, the scale chosen on the horizontal line.
- (c) On Saturday maximum number of shirts were sold. 60 shirts were sold on that day.
- (d) On Tuesday the minimum number of shirts were sold.
- (e) 35 shirts were sold on Thursday.

11. Observe this bar graph which shows the marks obtained by Aziz in half-yearly examination in different subjects.

Answer the given questions.

- (a) What information does the bar graph give?
- (b) Name the subject in which Aziz scored maximum marks.
- (c) Name the subject in which he has scored minimum marks.
- (d) State the name of the subjects and marks obtained in each of them.



- Sol. (a) This bar graph shows the marks obtained by Aziz in half yearly examination in different subjects.
- (b) In Hindi, Aziz has scored the maximum marks.
- (c) In social studies, he has scored the minimum marks.

(d)

	Subjects	Marks obtained
1.	Hindi	80
2.	English	60
3.	Mathematics	70
4.	Science	50
5.	Social studies	40

EXERCISE 11.1

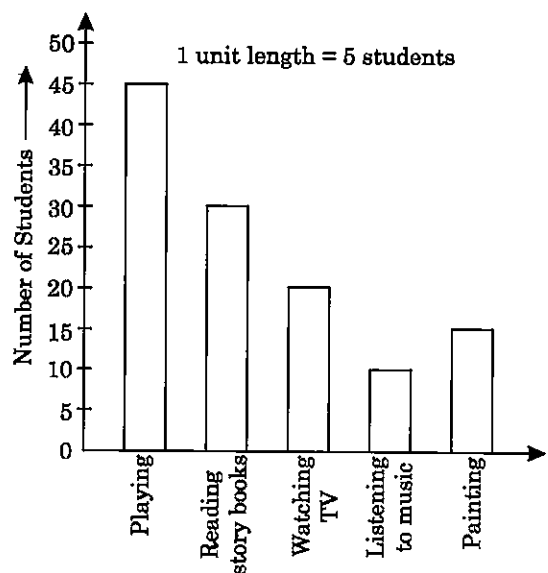
1. A survey of 120 school students was done to find which activity they prefer to do in their free time.

Preferred activity	Number of students
Playing	45
Reading story books	30
Watching TV	20
Listening to music	10
Painting	15

Draw a bar graph to illustrate the above data taking scale of 1 unit length = 5 students.

Which activity is preferred by most of the students other than playing?

- Sol. From the given information, we have the following bar graph.



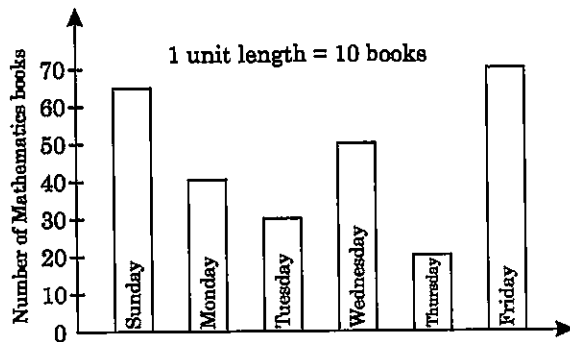
Activity reading story books is preferred by the most of the students other than playing.

- Q2. The number of Mathematics books sold by a shopkeeper on six consecutive days is shown below:

Days	Number of books sold
Sunday	65
Monday	40
Tuesday	30
Wednesday	50
Thursday	20
Friday	70

Draw a bar graph to represent the above information choosing the scale of your choice.

- Sol. From the given information, we have the following bar graph:



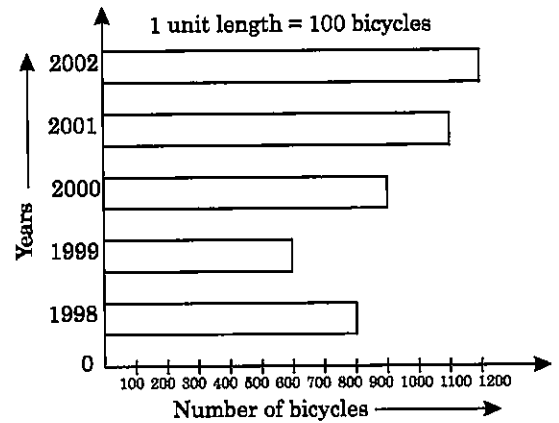
- Q3. Following table shows the number of bicycles manufactured in a factory during the years 1998 to 2002. Illustrate this data using bar graph. Choose a scale of your choice.

Years	Number of bicycles manufactured
1998	800
1999	600
2000	900
2001	1100
2002	1200

- (a) In which year were the maximum number of bicycles manufactured?
 (b) In which year were the minimum number of bicycles manufactured?

- Sol. From the given information, we have:

- (a) In the year of 2002, the maximum number of the bicycles were manufactured.
 (b) In the year of 1999, the minimum number of the bicycles were manufactured.



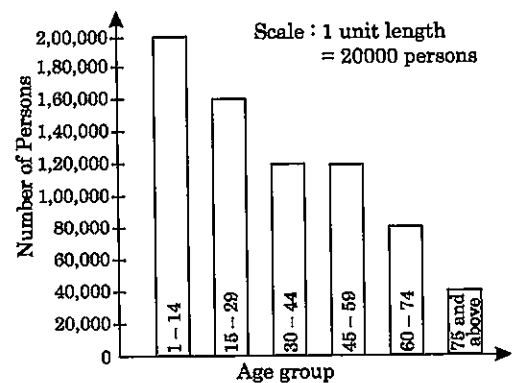
Number of persons in various age groups in a town is given in the following table.

Age group	Number of persons
1-14	2 Lakhs
15-29	1 lakh 60 thousands
30-44	1 lakh 20 thousands
45-59	1 lakh 20 thousands
60-74	80 thousands
75 and above	40 thousands

Draw a bar graph to represent the above information and answer the following questions. (take 1 unit length = 20 thousands)

- (a) Which two age groups have same population?
 (b) All persons in the age group of 60 and above are called senior citizens. How many senior citizens are there in the town?

- Sol. From the above information, we have the bar graph.



- (a) Age groups of 30-44 and 45-59 have the same population.
 (b) Number of Senior citizens are
 $80,000 + 40,000 = 1,20,000$

Learning More Q & A

Q1. A die was thrown 35 times and the following numbers were obtained:

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

Prepare a frequency table for the data.

Sol. From the given data, we have the following table.

Number	Tally marks	Frequency
1		6
2		7
3		6
4		5
5		5
6		6

Q2. The result of a Mathematics test is as follows:
80, 90, 70, 80, 80, 60, 80, 70, 90, 65, 100, 60, 70,
60, 70, 85, 65, 70, 70, 85, 90, 60, 65, 80, 60

Make a frequency table for the above data and answer the following questions:


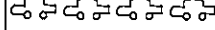
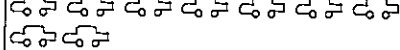
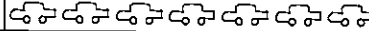
- What is the maximum marks obtained?
- How many students score less than 75 marks?
- How many students scored 80 marks or above?
- How many students appeared in the test?

Sol. From the above information, we have the following table.

Marks obtained	Tally marks	Frequency
60		5
65		3
70		6
80		5
85		2
90		3
100		1

- Maximum marks obtained by a student = 100
- $5 + 3 + 6 = 14$ students obtained marks less than 75.
- $5 + 2 + 3 + 1 = 11$ students scored marks 80 or above 80.
- Total 25 students were appeared in the test.

Q3. Mr. Rajan made a pictograph given below to show the number of cars washed at a car washing station during three days of a week.





Days	Number of cars washed	One  = 5 cars
Friday		
Saturday		
Sunday		

From the pictograph, find that:

- How many cars were washed on (i) Friday (ii) Saturday (iii) Sunday?
 - On which day the maximum number of cars were washed at the station?
 - On which day the minimum number of cars were washed at the station?
 - How many more cars were washed on Saturday than on Friday?
- Sol. (a) (i) On Friday – $4 \times 5 = 20$ cars
(ii) On Saturday – $9 \times 5 = 45$ cars
(iii) On Sunday – $7 \times 5 = 35$ cars.
- On Saturday, the maximum number of cars, i.e., $9 \times 5 = 45$ were washed at the stations.
 - On Friday, the minimum number of cars, i.e., $4 \times 5 = 20$ were washed on the station.
 - $45 - 20 = 25$ more cars were washed on Saturday than on Friday.

Q4. Read the pictograph given below and answer the following questions:

Persons employed in one year

Job	Number of persons	Each  = 3000 persons
Private service		
Government service		
Factory service		

- What is the number of persons employed in government service?
- How many more person were employed in government service than in private service?
- In which service, were the maximum number of persons employed?








- Sol. (a) Number of persons employed in government service = $10 \times 3000 = 30,000$
- (b) $10 \times 3000 - 6 \times 3,000 = 30,000 - 18,000 = 12,000$ persons were employed more in government service than in private service.
- (c) In government service, the maximum number of persons were employed.

Q5. In March 2012, children for six colonies of Meerut were given pulse polio Drops. The colonywise number of children were as follows:

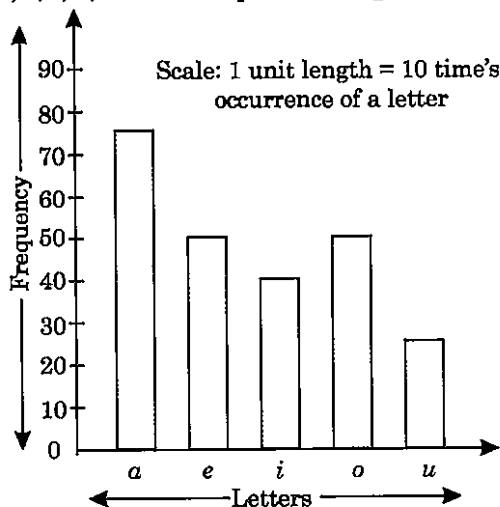
Colony A	2250
Colony B	1500
Colony C	2000
Colony D	1250
Colony E	1000
Colony F	1500

Represent the data by pictograph.

Sol. Pictograph:

Colony	Number of children	One  = 500 children
A	2250	
B	1500	
C	2000	
D	1250	
F	1500	
F	1500	

Q6. The given bar graph represents the frequency of *a*, *e*, *i*, *o*, and *u* in a piece of English writing.



- (a) Which letter occurred the maximum number of times?
- (b) Which letter occurred 40 times?
- (c) Which letter occurred less than 30 times?
- (d) Write down the five letters in the decreasing order of frequencies.

Sol. (a) *a* letter occurred the maximum number of times.

(b) *i* letter occurred 40 times.

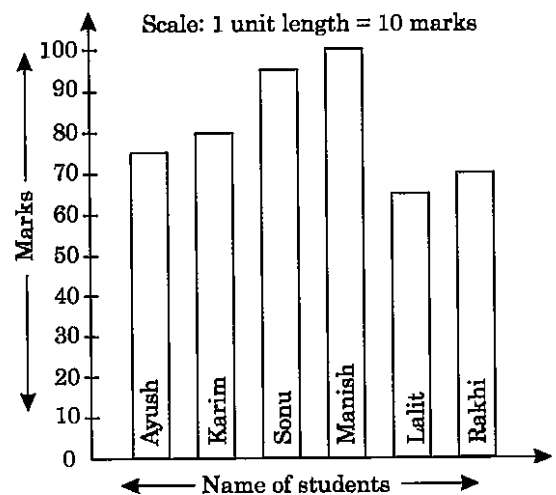
(c) *u* letter occurred less than 30 times.

(d) *a*, *e*, *o*, *i*, *u* is the decreasing order of their frequencies.

Q7. The marks obtained by six students in Mathematics are given below. Represent the data by a bar graph. Use a scale of 0.5 cm for each name on the horizontal axis and 0.5 cm for 10 marks on the vertical axis.

Students	Marks
Ayush	75
Karim	80
Sonu	95
Manish	100
Lalit	65
Rakhi	70

Sol. The required bar graph is given as below:



Test Yourself

Q1. Following is the choice of sweets of 30 students of Class V.

L B L J L B R L J B
 B L J J L R R L J B
 R R L J B L J B R L

(L = Ladoo, B = Burfi, J = Jalebi, R = Rasgulla)

Represent this information in a frequency distribution table, using tally marks. Also, answer the following:

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

(b) Which sweet is least preferred by students?

Q2. Draw the bar graph for the following data:

Name of fruits	Number of students
Banana	8
Orange	3
Apple	5
Guava	4

Q3. The following data gives India's Foreign exchange reserves (FER) in crores of rupees for some years:

Years	Foreign Exchange Reserves
1995 – 1996	4000
1996 – 1997	4500
1997 – 1998	5500
1998 – 1999	6000
1999 – 2000	6000
2000 – 2001	5500

Represent the above data with the help of a bar graph.

Q4. In a primary school, the number of students in different classes are as follows:

Class	Number of students
I	200
II	120
III	160
IV	140
V	120

Represent this data by a bar graph.

Q5. Following are the number of hours per week spent at home study by a class of 28 students of a school.

4 5 9 5 7 6 8 6 6 7
 4 6 6 6 7 7 7 7 7 7
 7 10 6 6 4 5 8 7

Prepare a frequency table for the above data and answer the following questions:

(a) What is the maximum number of hours spent on home study per week?

(b) How many students spent more than 7 hours on home study per week?

(c) What is the minimum number of hours spent on home study per week?

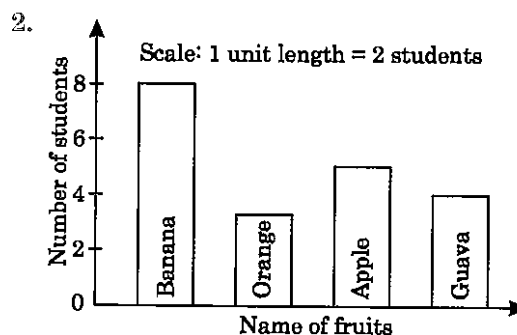
Answers

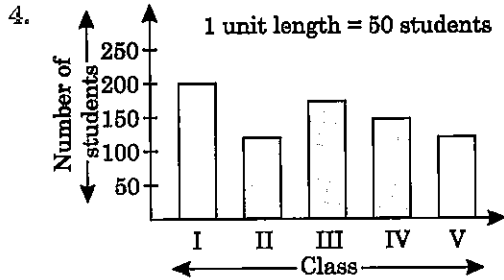
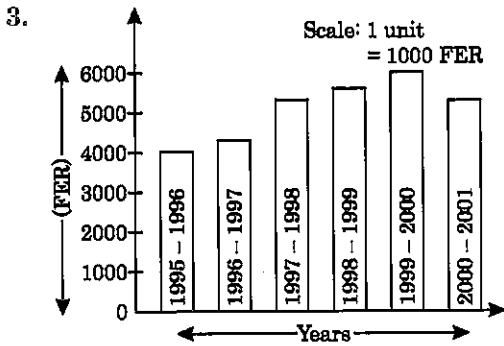
1.

Name of sweets	Tally marks	Choice of students
L		10
B		7
J		7
R		6
Total		30

(a) Ladoo

(b) Rasgulla





5.

Hours	Tally marks	Frequency
4		3
5		3
6		8
7		10
8		2
9		1
10		1
Total		28

- (a) 10 hours
- (b) 4 students
- (c) 4 hours

Internal Assessment

1. Fill in the blanks:

	Tally marks	Frequency
(i)	
(ii)	
(iii)	
(iv)	
(v)	

Q2. Fill in the blanks:

If the Symbol represents 8 kites and Symbol represents 4 kites, then

- (a) will represent kites.
- (b) will represent kites.
- (c) will represent kites.
- (d) will represent kites.

Q3. Match the following:

Column A	Column B
(a) Bars used to count frequencies.	(i) Pictograph
(b) Data collected from T.V.	(ii) Tally marks

(c) Data represented in the form of pictures.	(iii) Bar graph
(d) Data representing by rectangles having equal space.	(iv) Secondary data

Q4. Complete the following cross-puzzle.

Direction:

1. The number of data in a group is called .
2. A _____ is a representation of data by rectangular bars having equal space.
3. _____ represents the data using pictures.
4. Direct source gives the _____ data.
5. The numerical information is called _____.

Answers

1. (i) 7 (ii) 9 (iii) 2 (iv) 16 (v) 5
2. (a) 28 (b) 12 (c) 32 (d) 4
3. (a) \leftrightarrow (ii) (b) \leftrightarrow (iv) (c) \leftrightarrow (i) (d) \leftrightarrow (iii)
4. (1) FREQUENCY (2) BARGRAPH (3) PICTOGRAPH (4) PRIMARY (5) DATA.