

NCERT QUESTIONS WITH SOLUTIONS

FIGURE IT OUT

4.1 COLLECTING AND ORGANISING DATA

Naresh and Navya decided to go to each student in the class and ask what their favourite game is. Then they prepared a list. Navya is showing the list:

Mehnoor - Kabaddi	Pushkal - Satoliya (Pittu)	Anaya - Kabaddi
Jubimon - Hockey	Densy - Badminton	Jivisha - Satoliya (Pittu)
Simran-Kabaddi	Jivika - Satoliya (Pittu)	Rajesh - Football
Nand - Satoliya (Pittu)	Leela - Hockey	Thara Football -
Ankita - Kabaddi	Afshan - Hockey	Soumya - Cricket
Imon - Hockey	Keerat-Cricket	Navjot - Hockey
Yuvraj - Cricket	Gurpreet - Hockey	Hemal-Satoliya (Pittu)
Rehana - Hockey	Arsh-Kabaddi	Debabrata - Football
Aarna - Badminton	Bhavya - Cricket	Ananya - Hockey
Kompal - Football	Sarah- Kabaddi	Hardik - Cricket
Tahira - Cricket		

1. What would you do to find the most popular game among Naresh's and Navya's classmates?

Sol. To find the most popular game among Naresh's and Navya's classmates, I would tally the number of times each game is mentioned by their classmates. The game with the highest tally would be the most popular.

2. What is the most popular game in their class?

Sol. The most popular game in their class is Hockey.

3. Try to find out the most popular game among your classmates.

Sol. Cricket

4. Pari wants to respond to the questions given below. Put a tick [✓] for the questions where she needs to carry out data collection and put a cross [X] for the questions where she doesn't need to collect data. Discuss your answers in the classroom.

- What is the most popular TV show among her classmates? ✓
- When did India get independence? X
- How much water is getting wasted in her locality? ✓
- What is the capital of India? X

4.1 COLLECTING AND ORGANISING DATA

Shri Nilesh is a teacher. He decided to bring sweets to the class to celebrate the new year. The sweets shop nearby has jalebi, gulab jamun, gujiya, barfi, and rasgulla. He wanted to know the choices of the children. He wrote the names of the sweets on the board and asked each child to tell him their preference. He put a tally mark 'I' for each student and when the count reached 5, he put a line through the previous four and marked it as $\overline{\text{||||}}$.

1. Complete the table to help Shri Nilesh to purchase the correct numbers of sweets:

Sweets	Tally Marks	Number of Students
Jalebi	$\overline{\text{ }}$ I	6
Gulab jamun	$\overline{\text{ }}$	9
Gujiya	$\overline{\text{ }}$ $\overline{\text{ }}$	-----
Barfi		-----
Rasgulla	$\overline{\text{ }}$	-----

- (a) How many students chose Jalebi? (b) Barfi was chosen by students?
 (c) How many students chose gujiya? (d) Rasgulla was chosen by students?
 (e) How many students choose Gulab Jamun?

Sol. (a) 6 (b) 3 (c) $5 + 5 + 3 = 13$ (d) 7
 (e) 9

2. Is the above table sufficient to distribute each type of sweet to the correct student? Explain. If it is not sufficient, what is the alternative?

Sol. No, it is not sufficient. Shri Nilesh should have also written children's names against each sweet item. Only then he could have given the right sweet to the right child.

4.1 COLLECTING AND ORGANISING DATA

Sushri Sandhya asked her students about the sizes of the shoes they wear. She noted the data on the board —

4	5	3	4	3	4	5	5	4
5	5	4	5	6	4	3	5	6
4	6	4	5	7	5	6	4	5

1. Help her to figure out the following:

Sol. The largest shoe size in the class is _____.

The smallest shoe size in the class is _____.

There are _____ students who wear shoe size 5.

There are _____ students who wear shoe sizes larger than 4.

Here let's make the frequency table.

Shoe size	Tally marks	Number of students
3		3
4	$\overline{\text{ }}$	9
5	$\overline{\text{ }}$ $\overline{\text{ }}$	10
6		4
7	I	1
Total		27

The largest shoe size in the class is 7.

The smallest shoe size in the class is 3.

There are 10 students who wear shoe size 5.

There are 15 students who wear shoe sizes larger than 4.

2. How did arranging the data in ascending order help to answer these questions?

Sol. Let's arrange the data in ascending order:

3, 3, 3, 4, 4, 4, 4, 4, 4, 4, 4, 4, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 6, 6, 6, 6, 7

It takes a bit more time to answer as compared to the frequency table.

3. Are there other ways to arrange the data?

Sol. Yes, data can be arranged in descending order to find the largest values first, or grouped by frequency to quickly see the most common entries. Another method is grouping data into ranges, helping identify patterns or distributions across broader categories, making analysis more manageable and clear.

4. Write the names of a few trees you see around you. When you observe a tree on the way from your home to school (or while walking from one place to another place). Record the data and fill in the following table:-

Tree	Number of trees
Peepal	
Neem	

a. Which tree was found in the greatest number?

b. Which tree was found in the smallest number?

c. Were there any two trees found in the same numbers?

Sol. It is an activity.

Kindly do it yourself.

5. Take a blank piece of paper and paste any small news item from a newspaper. Each student may use a different article. Now, prepare a table on the piece of paper as given below. Count the number of each of the letters 'c', 'e', 'i', 'r', and 'x' in the words of the news article, and fill in the table.

Letter	c	e	i	r	x	Any other letter of your choice:
Number of times found in the news item						

(a) The letter found the most number of times is

(b) The letter found the least number of times is

(c) List the five letters 'c', 'e', 'i', 'r', 'x' in ascending order of frequency. Now, compare the order of your list with that of your classmates. Is your order the same or nearly the same as theirs? (Almost everyone is likely to get the order 'x, c, r, i, e'). Why do you think this is the case?

(d) Write the process you followed to complete this task.

(e) Discuss with your friends the processes they followed.

(f) If you do this task with another news item, what process would you follow?

Sol. It is an activity.

Kindly do it yourself.

4.2 PICTOGRAPHS

1. The following pictograph shows the number of books borrowed by students, in a week, from the library of Middle School, Ginnori—  = 1 book

Day	Number of Books Borrowed
Monday	    
Tuesday	   
Wednesday	 
Thursday	
Friday	    
Saturday	       

- On which day were the minimum number of books borrowed?
- What was the total number of books borrowed during the week?
- On which day were the maximum number of books borrowed? What may be the possible reason?

Sol. (a) Thursday

(b) Total number of books borrowed = $5 + 4 + 2 + 0 + 5 + 8 = 24$ books.

(c) Saturday As the next day is the school holiday, they would have enough time to read the books.

2. Magan Bhai sells kites at Jamnagar. Six shopkeepers from nearby villages come to purchase kites from him. The number of kites he sold to these six shopkeepers are given below-

Shopkeeper	Number of kites sold
Chaman	250
Rani	300
Rukhsana	100
Jasmeet	450
Jetha lal	250
Poonam Ben	700

Prepare a pictograph using the symbol to represent 100 kites.

Answer the following questions:

- How many symbols represent the kites that Rani purchased?
- Who purchased the maximum number of kites?
- Who purchased more kites, Jasmeet or Chaman?
- Rukhsana says Poonam Ben purchased more than double the number of kites that Rani purchased. Is she correct? Why?

Sol.

Name	Number of kites sold
Chaman	
Rani	
Rukhsana	
Jasmeet	
Jetha lal	
Poonam Ben	

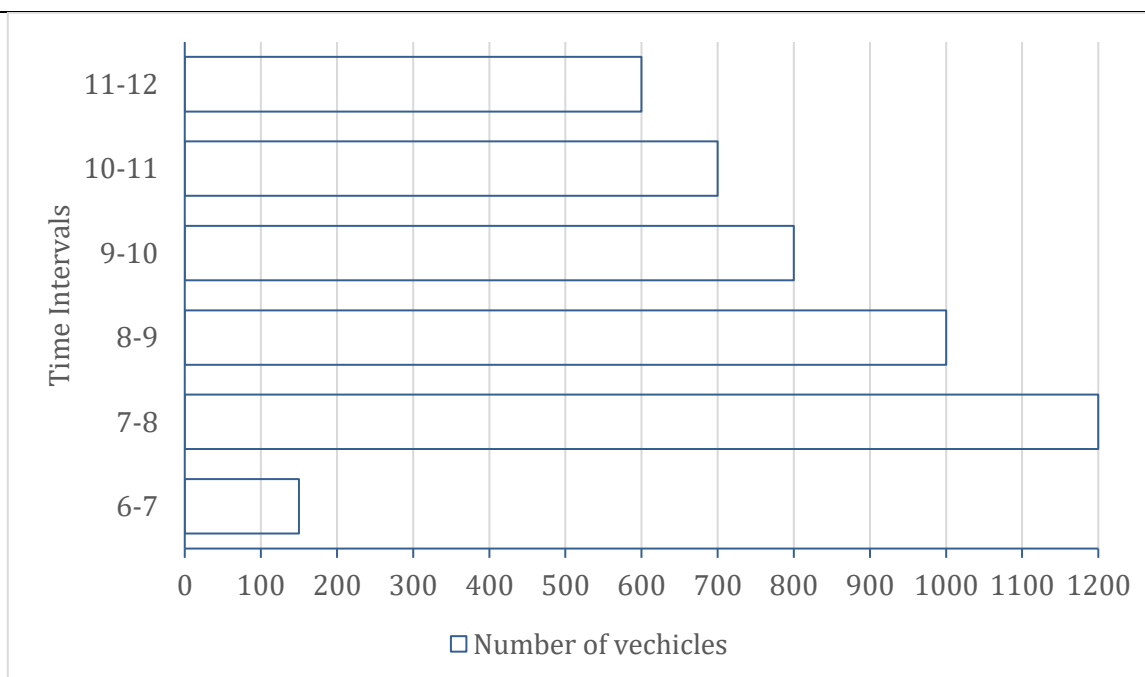
(a) Three symbols (b) Poonam Ben (c) Jasmeet (d) Yes.

Kites purchased by Rani = 300

Kites purchased by Poonam Ben = 700

Hence, Poonam Ben purchased more than double the number of kites that Rani purchased.

4.3 BAR GRAPHS



1. How many total cars passed through the crossing between 6 am and noon?

Sol. Total cars passed = $600 + 700 + 800 + 1000 + 1200 + 150 = 4450$ cars

2. Why do you think so little traffic occurred during the hours of 6- 7 am, as compared to the other hours from 7 am to noon?

Sol. The traffic that occurs during the hours 6-7 am is very little, as it is early morning time and there are very few office goers.

3. Why do you think the traffic was the heaviest between 7 am and 8 am?

Sol. 7-8 am is the hour when the maximum number of factory officers and workers use their cars and parents use their cars to drop their children at school.

4. Why do you think the traffic was lesser and lesser each hour after 8 am until noon?

Sol. Because, most of the schools start at 8 am and many factories also start at 8 am and hence less traffic between 8 am-9 am. Most offices start at 9 am and shops start at 10 am and hence less traffic between 9 am-10 am.

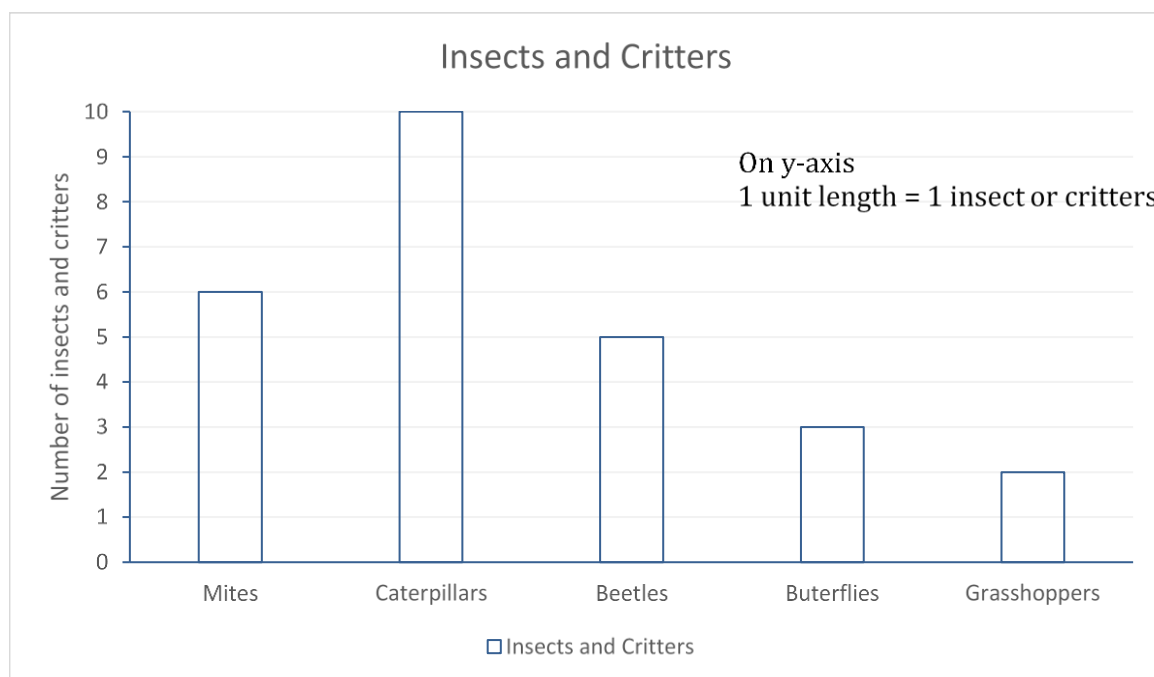
4.4 DRAWING A BAR GRAPH

1. Samantha visited a tea garden and collected data of the insects and critters she saw there. Here is the data she collected—

				
Mites	caterpillars	Beetles	Butterflies	Grasshoppers
6	10	5	3	2

Help her prepare a bar graph representing this data.

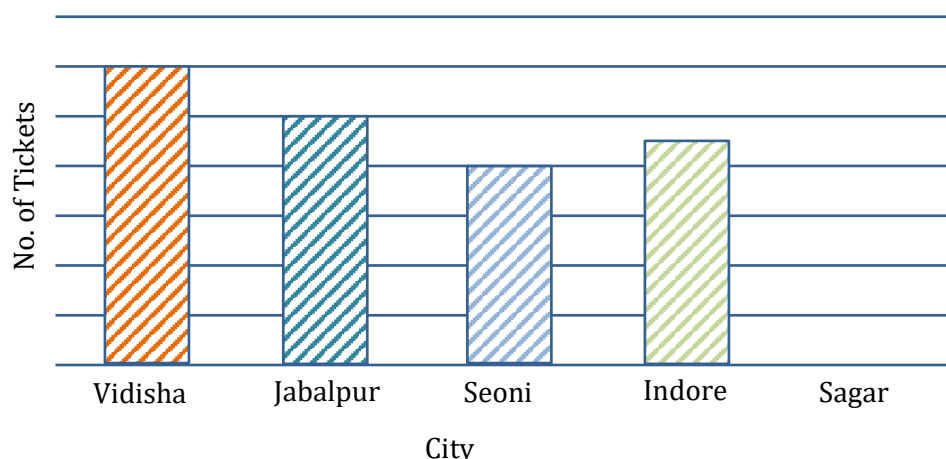
Sol.



2. Pooja collected data on the number of tickets sold at the Bhopal railway station for a few different cities of Madhya Pradesh over a 2-hour period.

City	Vidisha	Jabalpur	Seoni	Indore	Sagar
Number of tickets	24	20	16	28	16

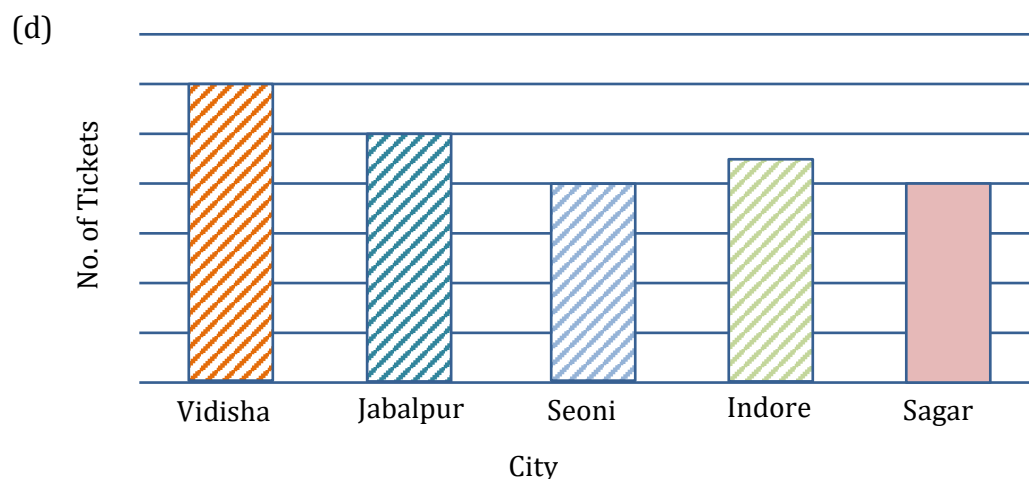
She used this data and prepared a bar graph on the board to discuss the data with her students, but someone erased a portion of the graph.



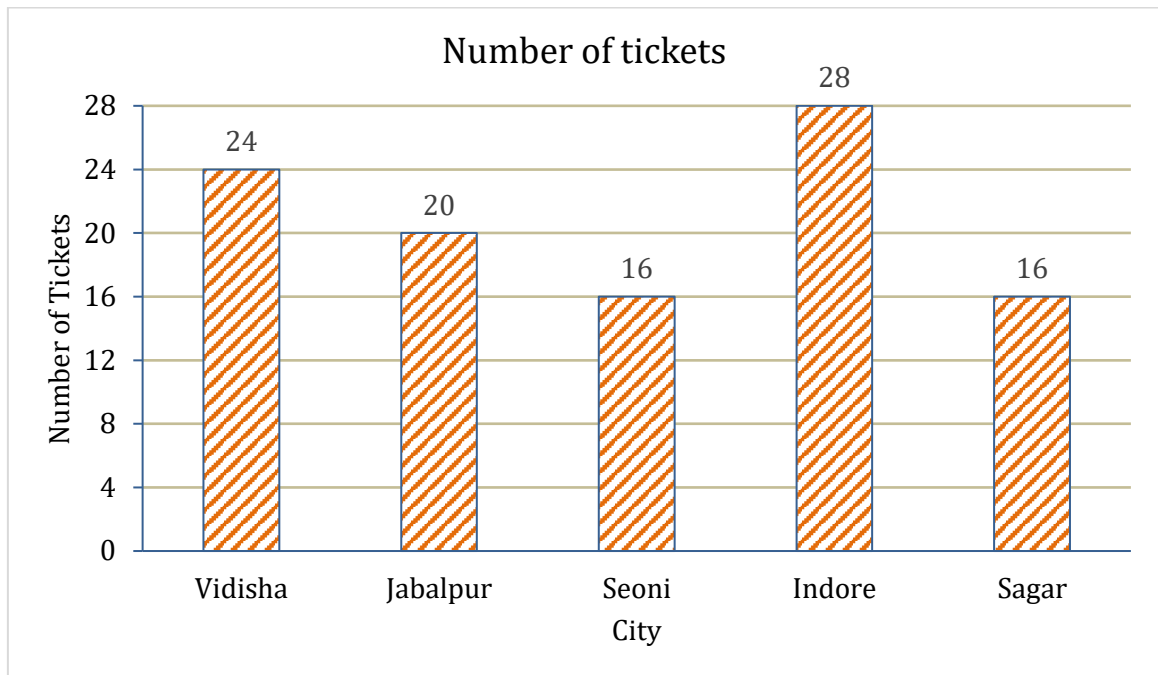
- Write the number of tickets sold for Vidisha above the bar.
- Write the number of tickets sold for Jabalpur above the bar.
- The bar for Vidisha is 6 unit lengths and the bar for Jabalpur is 5 unit lengths. What is the scale for this graph?
- Draw the correct bar for Sagar.
- Add the scale of the bar graph placing the correct numbers on the vertical axis.
- Are the bars for Seoni and Indore correct in this graph? If not, draw the correct bar(s).

Sol. (a) 24 tickets
(b) 20 tickets

(c) 1 unit length = $\frac{\text{Total tickets for Vidisha}}{6 \text{ divisions}} = \frac{24}{6} = 4 \text{ tickets}$



(e) 1 unit length = 4 tickets



(f) The bars for Seoni is correct but the bar for Indore is not correct. The correct is drawn in (e).

3. Chinu listed the various means of transport that passed across the road in front of his house from 9 am to 10 am:

bike	car	Bike	Bus	bike	bike
bike	auto	bicycle	bullock cart	bicycle	auto
car	scooter	car	auto	bicycle	bike
car	auto	bike	scooter	bike	car
bicycle	scooter	bicycle	scooter	bike	bus
auto	auto	bike	bicycle	bus	bike
bicycle	scooter	bus	scooter	auto	bike
scooter	bicycle	bike	bullock cart	auto	scooter
car	scooter				

- (a) Prepare a frequency distribution table for the data.
 (b) Which means of transport was used the most?
 (c) If you were there to collect this data, how could you do it? Write the steps or process.

Sol. (a)

Vehicle	Tally marks	Number of vechile
Bike	 	13
Car	 	6
Bicycle	 	8
Auto	 	8
Scooter	 	9
Bus		4
Bullock cart		2

(b) Bike

(c) Observation Timeframe

I will choose a specific timeframe, such as 9 am to 10 am, to observe the road traffic.

Recording Data

I will use a tally chart or counting app to record the type of transport passing by during that hour.

Categorisation

I will organise the data into categories (e.g., bike, car, scooter, bus, etc.).

Final Count

After the observation period, I will get the total number of occurrences for each category.

Analysis

Finally, I will prepare a frequency distribution table based on the recorded data for analysis.

4. Roll a die 30 times and record the number you obtain each time. Prepare a frequency distribution table using tally marks. Find the number that appeared:
- The minimum number of times.
 - The maximum number of times.
 - Find numbers that appeared an equal number of times.

Sol. Let the outcomes of 30 times roll of a die be

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

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

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

Number on the die	Tally marks	Number of throws
1	 	7
2	 	8
3	 	5
4		3
5		4
6		3

- The minimum number of times: 4 and 6
- The maximum number of times: 2
- The numbers that appeared an equal number of times: 4 and 6.

This is an activity. So, you can also perform it yourself and prepare 9 frequency table.

5. Faiz prepared a frequency distribution table of data on the number of wickets taken by Jaspreet Bumrah in his last 30 matches:

Wickets Taken	Number of matches
0	2
1	4
2	6
3	8
4	3
5	5
6	1
7	1

- What information is this table giving?
- What may be the title of this table?
- What caught your attention in this table?
- In how many matches has Bumrah taken 4 wickets?
- Mayank says "If we want to know the total number of wickets he has taken in his last 30 matches, we have to add the numbers 0, 1, 2, 3 ..., up to 7." Can Mayank get the total number of wickets taken in this way? Why?
- How would you correctly figure out the total number of wickets taken by Bumrah in his last 30 matches, using this table?

Sol. (a) The information in the table gives an overview of the number of matches in which he took wickets from 0 to 7.

(b) Frequency distribution table indicating the bowling performance of Jaspreet Bumrah.

(c) Bumrah has taken 3 or more wickets in most of the matches.

(d) Three matches

(e) No

(f) He can get the correct total, by adding the following points.

$$(2 \times 0) + (4 \times 1) + (6 \times 2) + (8 \times 3) + (3 \times 4) + (5 \times 5) + (1 \times 6) + (1 \times 7) \\ = 0 + 4 + 12 + 24 + 12 + 25 + 6 + 7 = 90$$

6. The following pictograph shows the number of tractors in five different villages.

Villages	Number of Tractors	( = 1 Tractor)
Village A		
Village B		
Village C		
Village D		
Village E		

Observe the pictograph and answer the following questions—

- Which village has the smallest number of tractors?
- Which village has the most tractors?
- How many more tractors does Village C have than Village B?
- Komal says, “Village D has half the number of tractors as Village E.” Is she right?

- Sol.**
- Village D
 - Village C
 - 3 more tractors
 - Yes

7. The number of girl students in each class of a school is depicted by a pictograph:

Classes	Number of Girl Students ( = 4 Girls)
1	     
2	    
3	    
4	   
5	  
6	   
7	  
8	 

Observe this pictograph and answer the following questions:

- Which class has the least number of girl students?
- What is the difference between the number of girls in Class 5 and 6?
- If 2 more girls were admitted in Class 2, how would the graph change?
- How many girls are there in Class 7?

- Sol.**
- (a) Class 8
- (b) Number of Girls in class 6 = $4 \times 4 = 16$
 Number of Girls in class 5 = $4 \times 2.5 = 10$
 Hence difference = $16 - 10 = 6$
- (c) Five full symbols of a girl
- (d) $3 \times 4 = 12$ girls.

8. Mudhol Hounds (a type of breed of Indian dogs) are largely found in North Karnataka's Bagalkote and Vijayapura districts. The government took an initiative to protect this breed by providing support to those who adopted these dogs. Due to this initiative, the number of these dogs increased. The number of Mudhol dogs in six villages of Karnataka are as follows—

Village A : 18, Village B : 36, Village C : 12, Village D : 48, Village E : 18,
Village F : 24

Prepare a pictograph and answer the following questions:

- What will be a useful scale or key to draw this pictograph?
- How many symbols will you use to represent the dogs in Village B?
- Kamini said that the number of dogs in Village B and Village D together will be more than the number of dogs in the other 4 villages. Is she right? Give reasons for your response.

Sol.

Village	Number of dogs (* = 6 dogs)
A	* * *
B	* * * * *
C	* *
D	* * * * * *
E	* * *
F	* * * *

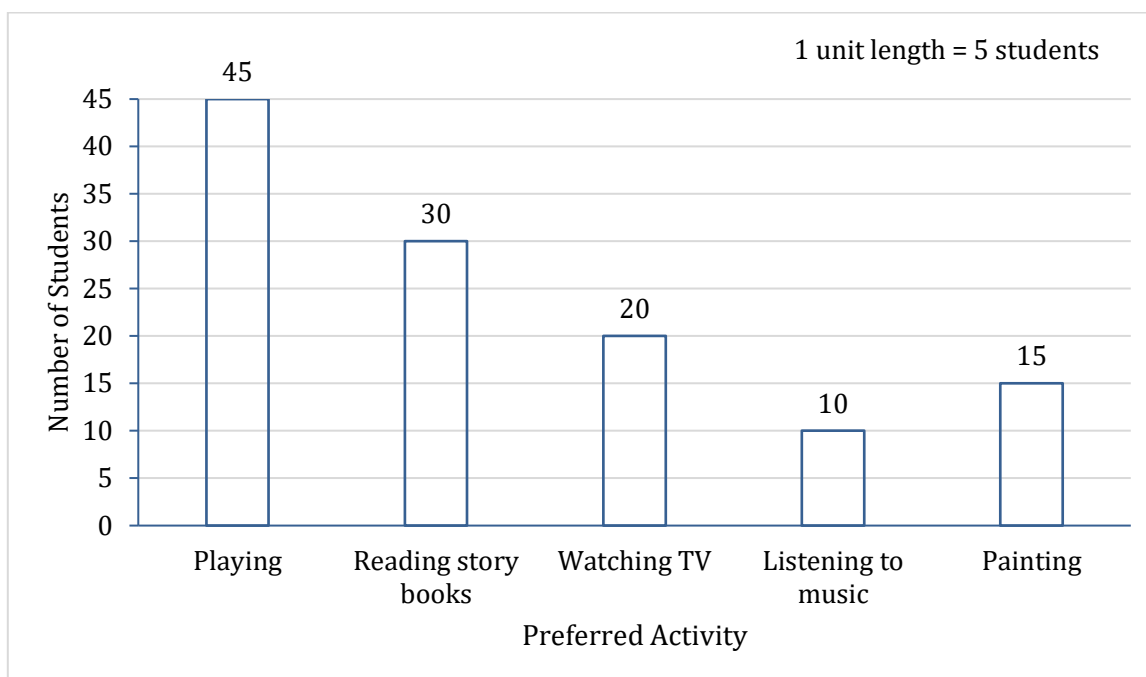
- (a) * = 6 dogs will be a useful scale or key to draw this pictograph.
 (b) 6 symbols.
 (c) Yes, because Total no. of dogs in villages B and D = 6 + 8 = 14 Symbols = $14 \times 6 = 84$ dogs
 Total no. of dogs in remaining 4 villages = 3 + 2 + 3 + 4 = 12 Symbols = $12 \times 6 = 72$ dogs

9. A survey of 120 school students was conducted to find out which activity they preferred 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

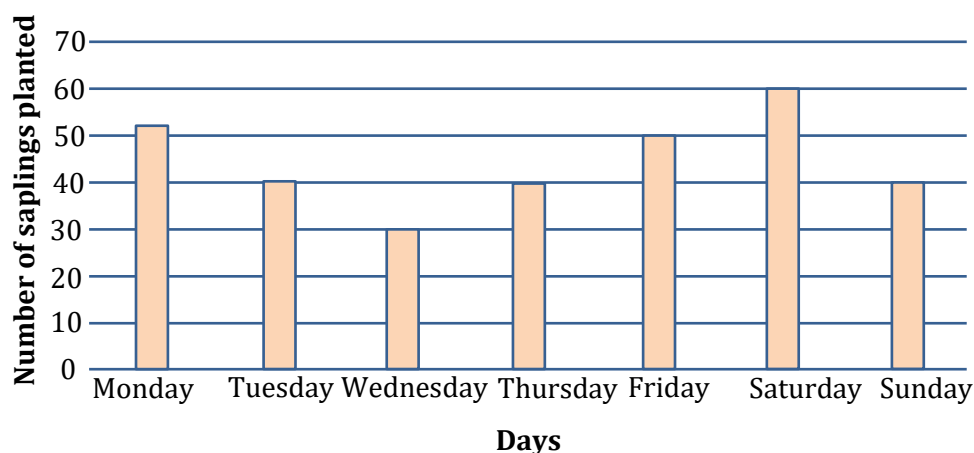
Draw a bar graph to illustrate the above data taking the scale of 1 unit length = 5 students.
 Which activity is preferred by most students other than playing?

Sol.



Other than playing, reading story books is preferred by most students.

10. Students and teachers of a primary school decided to plant tree saplings in the school campus and in the surrounding village during the first week of July. Details of the saplings they planted are as follows—

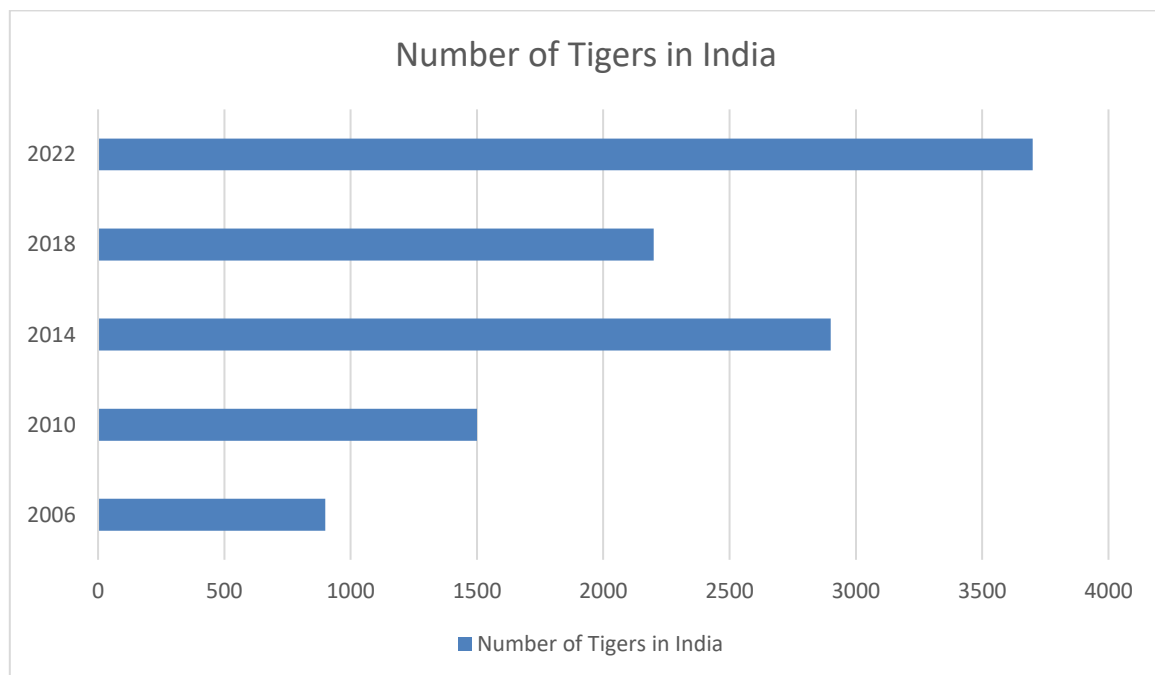


- The total number of saplings planted on Wednesday and Thursday is _____.
 - The total number of saplings planted during the whole week is _____.
 - The greatest number of saplings were planted on _____, and the least number of saplings were planted on _____.
- Why do you think that is the case? Why were more saplings planted on certain days of the week and less on others? Can you think of possible explanations or reasons? How could you try and figure out whether your explanations are correct?

- Sol.** (a) $30 + 40 = 70$ saplings
 (b) $52 + 40 + 30 + 40 + 50 + 60 + 40 = 312$ saplings
 (c) Saturday, Wednesday.

- 11.** The number of tigers in India went down drastically between 1900 and 1970. Project Tiger was launched in 1973 to track and protect tigers in India. Starting in 2006, the exact number of tigers in India was tracked. Shagufta and Divya looked up information about the number of tigers in India between 2006 and 2022 in 4-year intervals. They prepared a frequency table for this data and a bar graph to present this data, but there are a few mistakes in the graph. Can you find those mistakes and fix them?

Year	Number of Tigers (approx.)
2006	1400
2010	1700
2014	2200
2018	3000
2022	3700



Sol. Yes, there are a few mistakes in the graph.

1. No. of tigers in 2006 was 1400 but shown less in the graph.
2. No. of tigers in 2014 was 2200 but shown more in the graph.
3. No. of tigers in 2018 was 3000 but shown less in the graph.

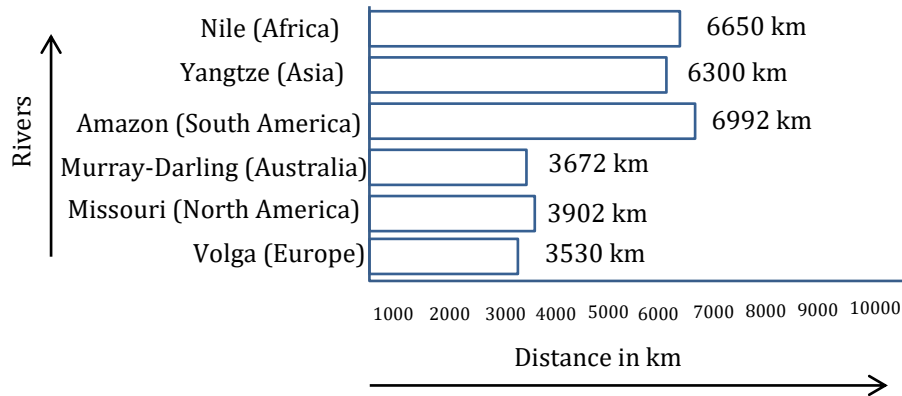
4.5 ARTISTIC AND AESTHETIC CONSIDERATIONS

- 1.** If you wanted to visually represent the data of the heights of the tallest persons in each class in your school, would you use a graph with vertical bars or horizontal bars? Why?

Sol. Graph with vertical bars. Vertical graphs are like pillars and show a much better presentation of the person's height.

2. If you were making a table of the longest rivers on each continent and their lengths, would you prefer to use a bar graph with vertical bars or horizontal bars? Why? Try finding out this information, and then make the corresponding table and bar graph! Which continents have the longest rivers?

Sol. Graph with horizontal bars, because rivers flow on land horizontally.



According to graph, Nile, Yangtze and Amazon are some of the examples of longest rivers in the world.