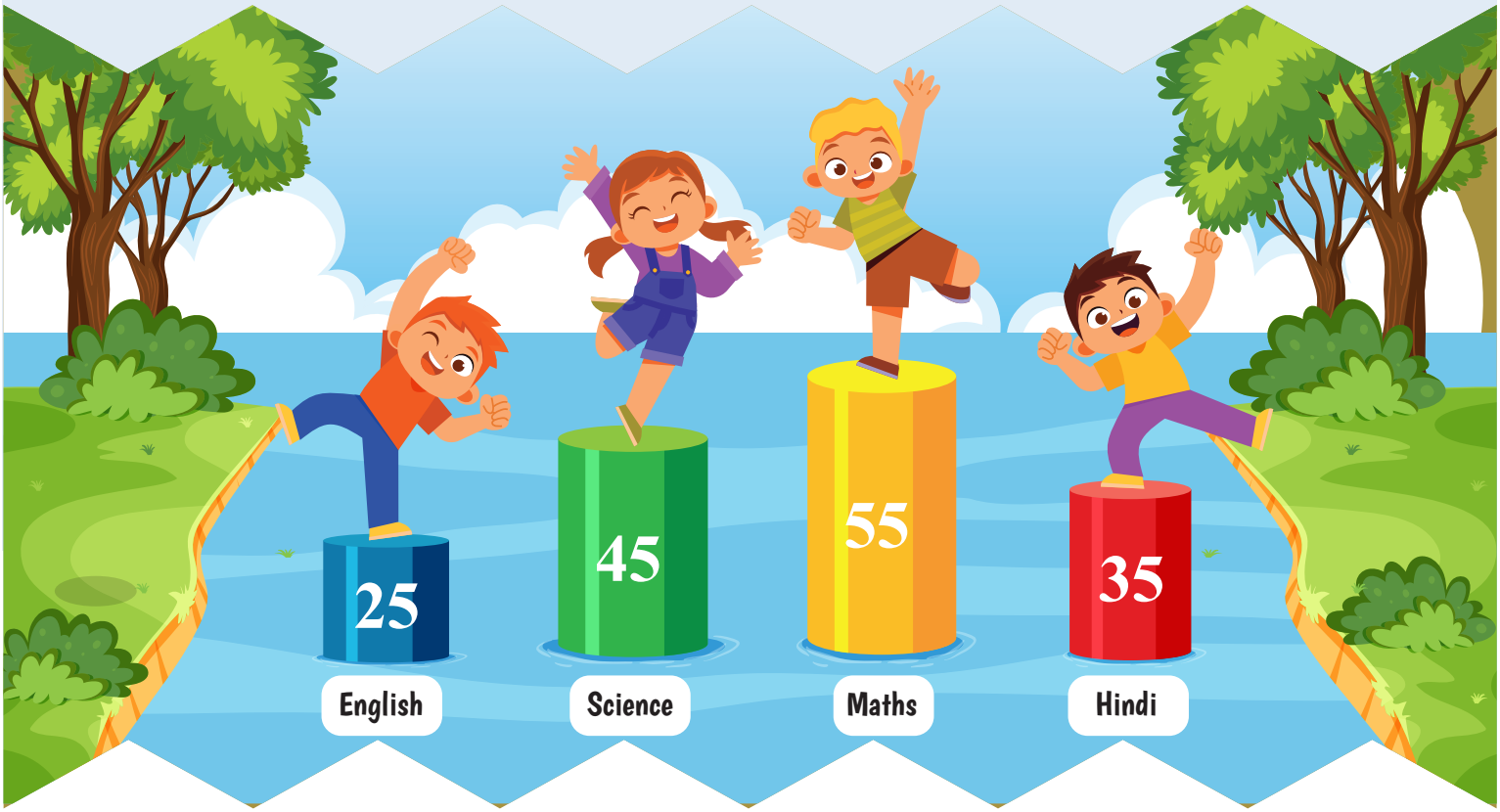
1. Data Handling



Key Concepts

1. Pictograph
2. Reading and interpreting bar graph

Why should I read this chapter?

Data handling is the process of collecting, organising, analysing and interpreting data. Pictographs and bar graphs are essential for data handling because they use pictures and bars to help us understand the data easily.

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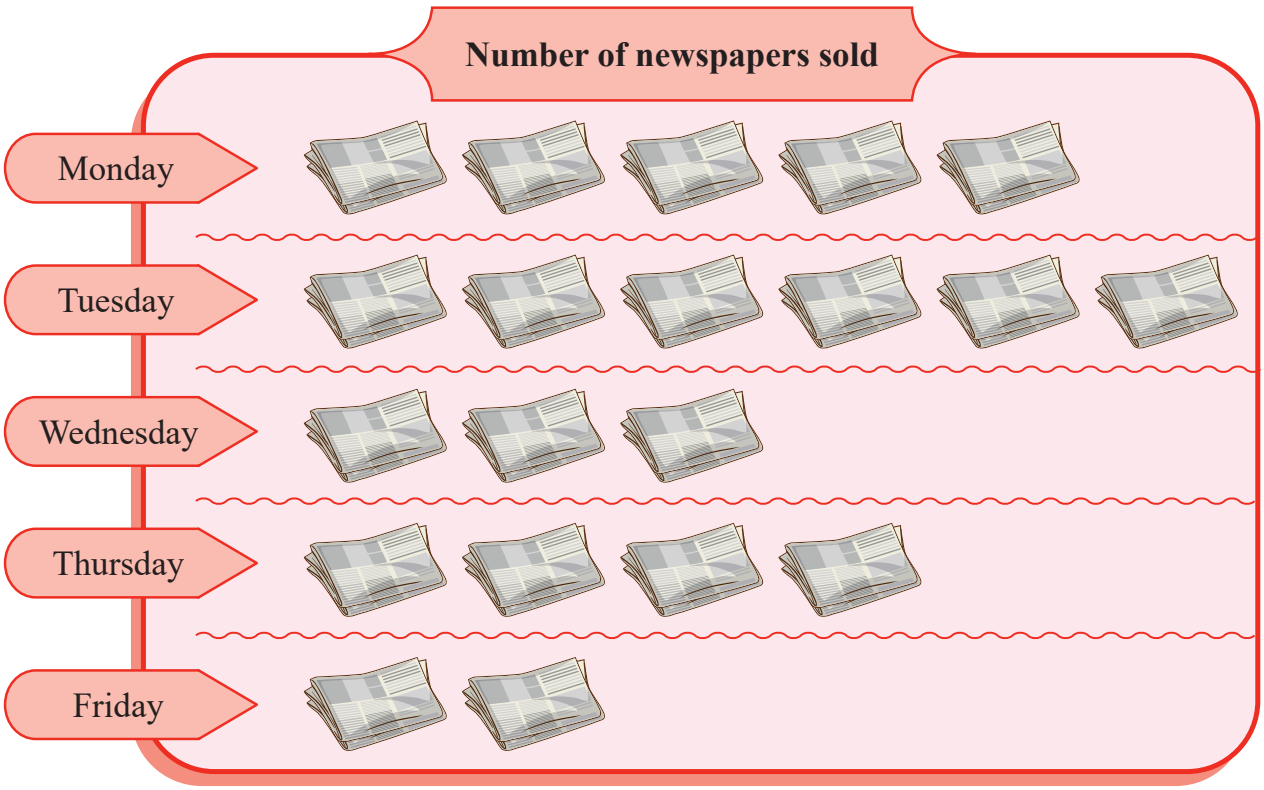
Recap

1. The given pictograph shows the number of newspapers sold on weekdays. Study the pictograph and answer the following questions.



key: = 10 newspapers

a. On which day were the highest number of newspapers sold?

b. How many newspapers were sold on Thursday?

c. How many more newspapers were sold on Monday than on Wednesday?

d. How many newspapers were sold in total?

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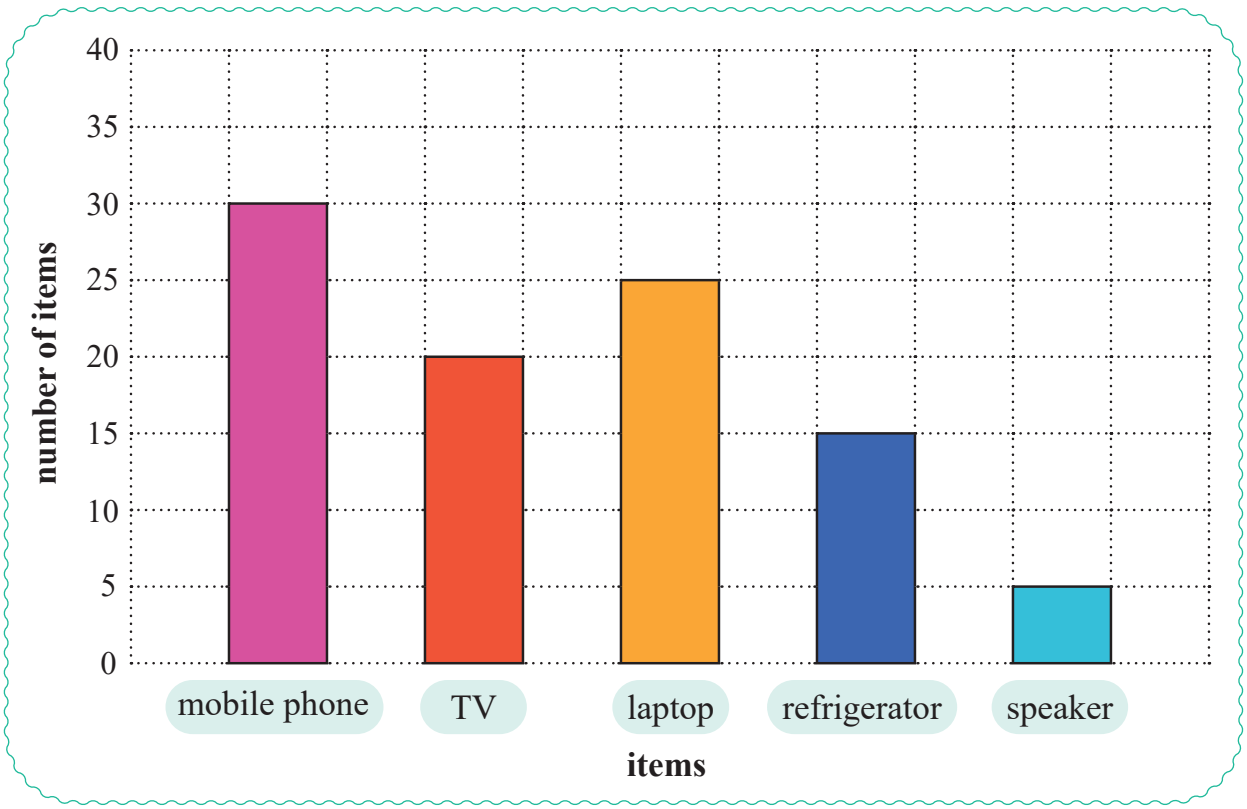
2. The following bar graph shows the number of items sold at an electronic shop. Use the bar graph and answer the following questions.



(a.) Which electronic item was sold the most?

(b.) How many laptops were sold?

(c.) How many TVs and speakers were sold in total?

(d.) How many fewer refrigerators were sold than mobile phones?

(e.) Which item was sold the least?

(f.) How many items were sold in total?

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Prep-up

A survey was conducted to find the favourite holiday destinations of the people in a housing society. The collected data is given in the table below.

Destination	Number of votes
Shimla	24
Kashmir	32
Rajasthan	16
Kerala	40
Goa	48

Study the table carefully and find out which destinations are preferred the most and least, respectively.

most preferred: _____ least preferred: _____

It seems difficult when we have to examine the table to find out a particular piece of data. But the same task will be simplified when we visualise the whole thing.

In data handling, we represent these data in a way that makes it easy for us to visualise and find out a particular piece of data from them.

In the previous grade, we had already learnt a few methods to handle data.

Write the name of the method where we use pictures or symbols to represent data.

_____

In which method do we use bars to represent the data? _____

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Pictograph

A pictograph shows data using pictures or symbols. A key to a pictograph tells us the number or quantity each picture or symbol represents.

We can create a pictograph when a collection of data is given to us. To make a pictograph from the given data, we follow the steps given below.

- Collect the data.
- Plot the data using a table.
- Choose a picture or a symbol for a key to the data.
- Observe the number of objects and assign a suitable key using the chosen picture or symbol.
- Draw the pictograph.
- Label the pictograph. Write the title at the top and the key at the bottom.

Now, let us make a pictograph using the data given in the Prep-up section.

We first find a common factor of all the numbers given in the data. Then, we divide all numbers by that common factor to find the number of symbols needed.

Here, we see that 8 is a common factor of all the numbers. So, we can make a key where one symbol represents 8 votes.

Destination	Number of votes	Number of symbols
Shimla	24	$24 \div 8 = 3$
Kashmir	32	$32 \div 8 = 4$
Rajasthan	16	$16 \div 8 = 2$
Kerala	40	$40 \div 8 = 5$
Goa	48	$48 \div 8 = 6$

To show 24 votes, we draw $24 \div 8 = 3$ symbols, and so on.

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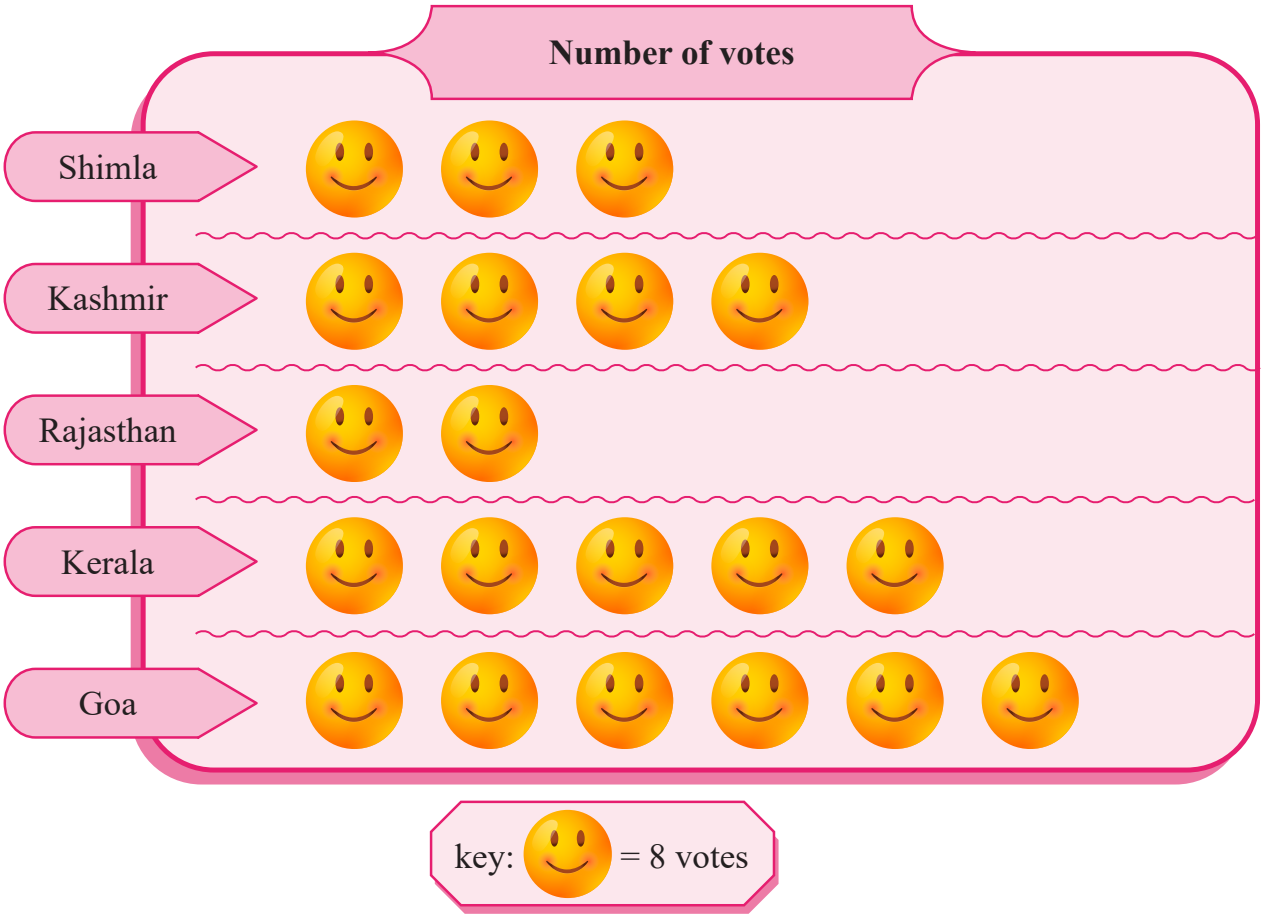

A key must be simple, clear and easily recognisable.

Let us find a different key to the same data and make another pictograph.

We see that 4 is also a common factor of all the numbers in the given data.

Destination	Number of votes	Number of symbols
Shimla	24	24 ÷ 4 = 6
Kashmir	32	32 ÷ 4 = 8
Rajasthan	16	16 ÷ 4 = 4
Kerala	40	40 ÷ 4 = 10
Goa	48	48 ÷ 4 = 12

So, we can use one symbol to represent 4 votes and make the pictograph.

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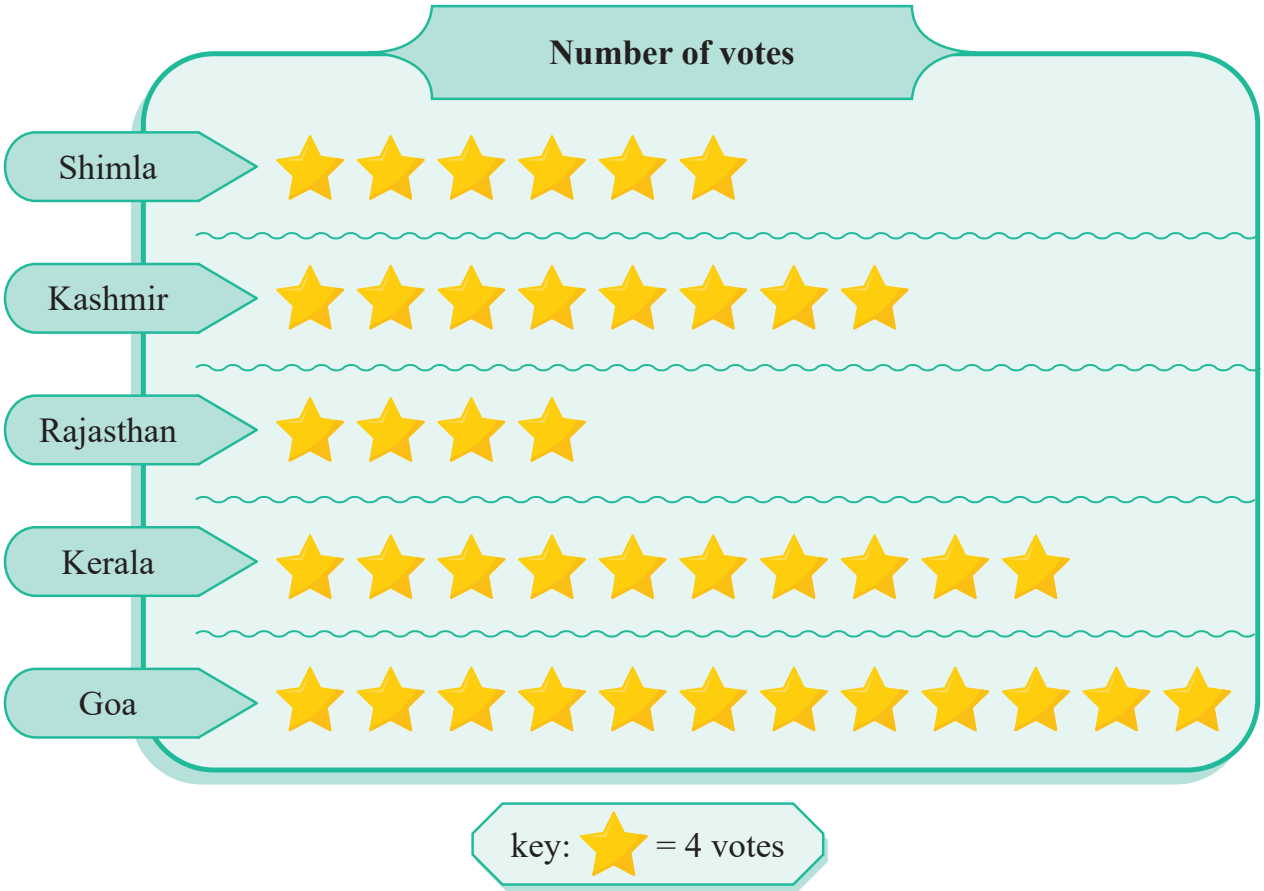

Does this pictograph look the same as the previous one? _____

The pictograph of any data depends on the key. It changes as and when the key changes.

Example 1: A postman delivered some letters in 4 days. Use the data below to draw a pictograph with the given key.

Letters delivered	
Day	**Number of letters**
Monday	16
Tuesday	12
Wednesday	20
Thursday	8

key:  = 4 letters

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Solution:

We see that 4 is a common factor of all the numbers in the given data. So we divide each number of the data by 4 to find out the number of symbols to be used.

$16 \div 4 = 4$, $12 \div 4 = 3$, $20 \div 4 = 5$ and $8 \div 4 = 2$

We have to draw 4 symbols to represent the number of letters delivered on Monday, 3 symbols to represent the number of letters delivered on Tuesday and so on.

Thus we get the required pictograph, as given below.

Letters delievered

Monday	
Tuesday	
Wednesday	
Thursday	

key:  = 4 letters

Example 2: The following table shows the number of different articles sold on a particular day at a garment store. Use the data below and make a pictograph with a suitable key.

Articles sold

Article	Number of articles sold
shirt	18
cap	6
skirt	12
trousers	15

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Solution:

We see that 3 is a common factor of all the numbers in the given data. So we divide each number in the data by 3.

$18 \div 3 = 6$, $6 \div 3 = 2$, $12 \div 3 = 4$ and $15 \div 3 = 5$

Let us use  to represent 3 articles. Then we get the required pictograph, as given below.

Articles sold	
shirt	
cap	
skirt	
trousers	

key:  = 3 articles

Progress Meter 1

1. The table below shows the number of books sold by a shop in a month. Represent the given data using a pictograph and a suitable key.

Sale of books	
Weeks	**Number of books**
Week 1	25
Week 2	15
Week 3	10
Week 4	30

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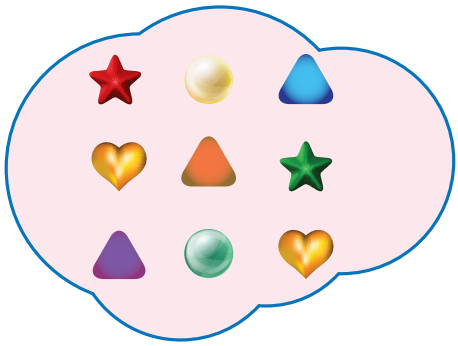
2. Riya has beads of the following shapes. Use the data to draw a pictograph with a suitable key.

Shapes of beads	
Shape	**Number of beads**
star	21
round	14
triangle	28
heart	35

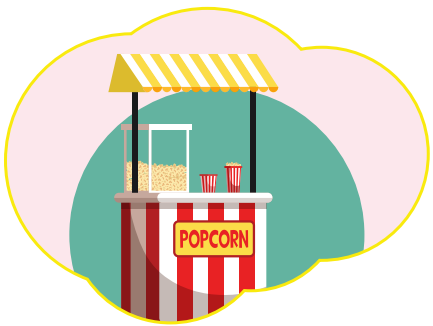


3. The following data is the result of a survey conducted among a few students to know their favourite beach activities. Represent the data using a pictograph with a suitable key.

Favourite beach activities	
Activities	**Number of students**
swimming	36
making sandcastle	18
flying kite	9
volleyball	27

4. The following table shows the number of popcorn cups sold in 5 days. Represent this data using a pictograph with a suitable key.

Sale of popcorn	
Days	**Number of popcorn cups**
Monday	32
Tuesday	40
Wednesday	56
Thursday	64
Friday	48



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Reading and interpreting bar graph

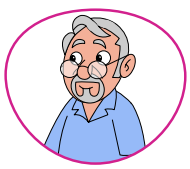
Rohan is making a project on the most visited places on holidays. He collected the following data from the people of his housing society.

Place	Number of people
planetarium	60
museum	45
zoo	30
aquarium	15



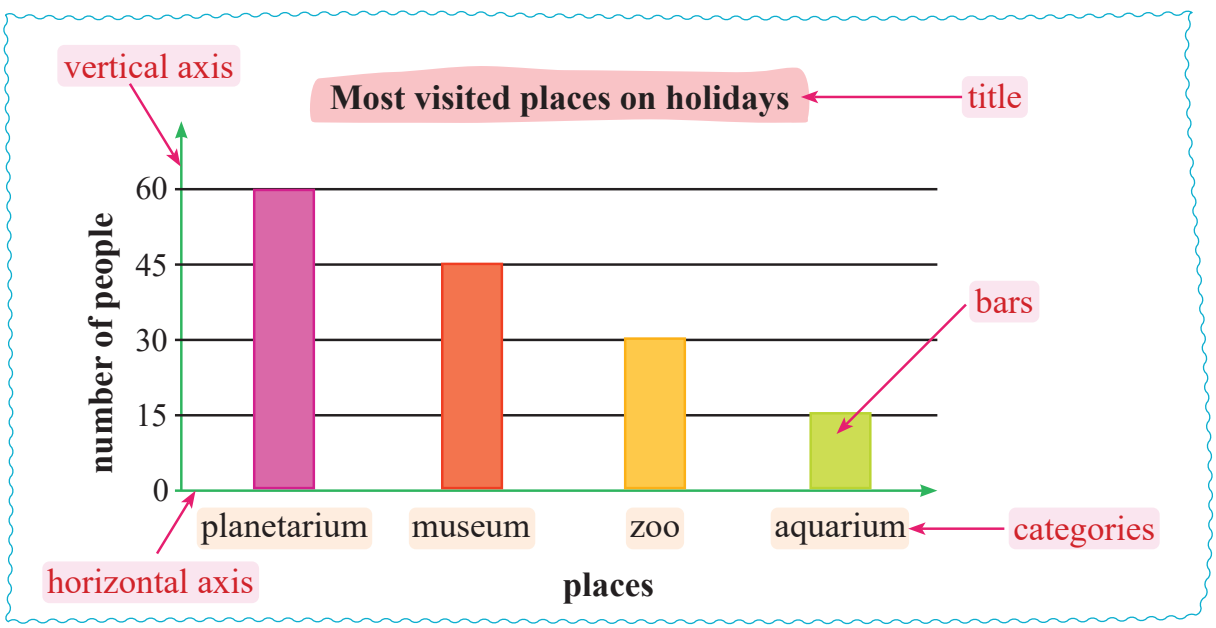

We can represent this data in a pictograph. But can we do the same for a bar graph?

Yes, you can represent the data in a bar graph as well.



A bar graph is a method of representing data using vertical rectangular bars.

Let us make a bar graph of the above data and learn about its components.



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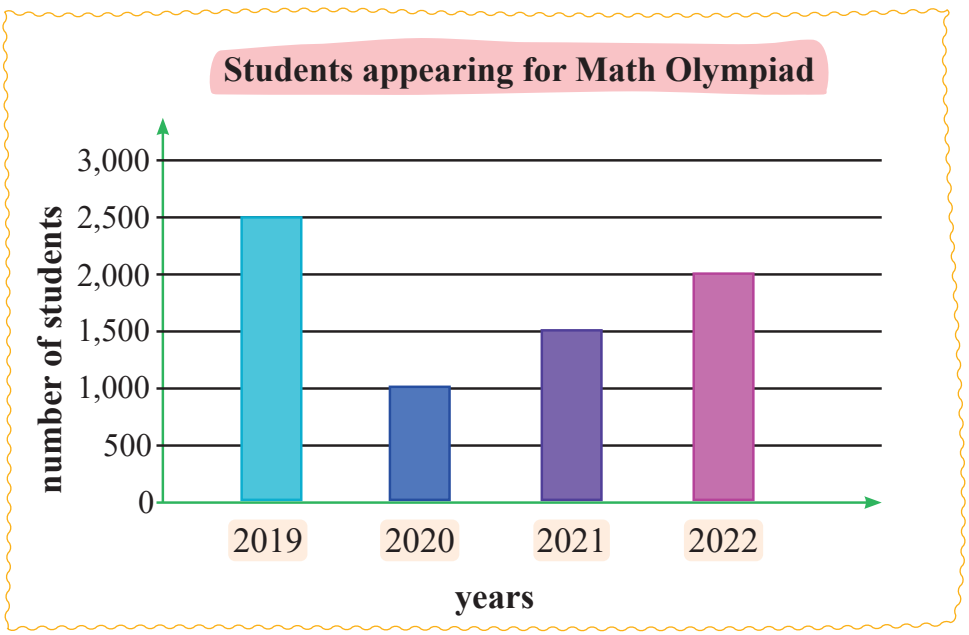
Title: The title of a bar graph gives an explanation of the data shown. It is written on top of the bar graph.

Scale: The numbers or marks on the vertical axis of a bar graph form the scale of the graph.

Categories: The items (for example, days, names, objects, etc.) written along the horizontal axis of a bar graph represent the categories of the graph. Separate bars are made for each category.

The quantity of each category is shown on the scale along the vertical axis.

Example 3: The following bar graph shows the number of students who appear for the Math Olympiad every year in town. Read the bar graph and answer the questions below.



(a.) How many students appeared for the Olympiad in 2019?

(b.) Which year had the least number of students?

(c.) How many more students appeared in 2022 than in 2021?

(d.) How many fewer students appeared in 2021 than in 2019?

(e.) Find the total number of students who appeared in the years 2020 and 2021.

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Solution:

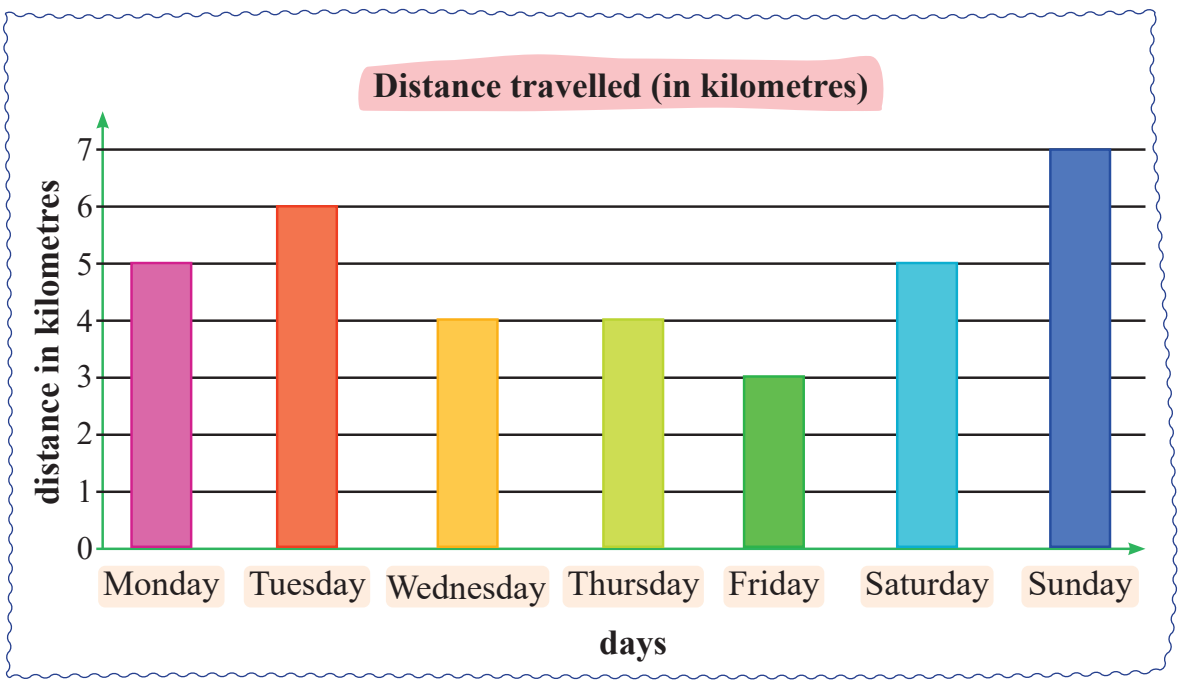
(a.) 2,500 (b.) 2020

(c.) Number of students appeared in 2022 = 2,000
Number of students appeared in 2021 = 1,500
Number of students appeared more in 2022 than in 2021 = 2,000 − 1,500
= 500

(d.) Number of students appeared in 2021 = 1,500
Number of students appeared in 2019 = 2,500
Number of students appeared less in 2021 than in 2019 = 2,500 − 1,500
= 1,000

(e.) Number of students appeared in 2020 = 1,000
Number of students appeared in 2021 = 1,500
Total number of students appeared in 2020 and 2021 = 1,000 + 1,500
= 2,500

Example 4: Ravi recorded the distance he travelled by car in a week and made a bar graph for it. Read the bar graph and answer the following questions.



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(a.) How much distance did Ravi travel on Monday?

(b.) On which day did he travel the same as Wednesday?

(c.) On which day did he travel the least?

(d.) On which day did he travel the most?

(e.) Find the total distance travelled on Tuesday and Saturday.

Solution:

(a.) 5 km (b.) Thursday (c.) Friday (d.) Sunday

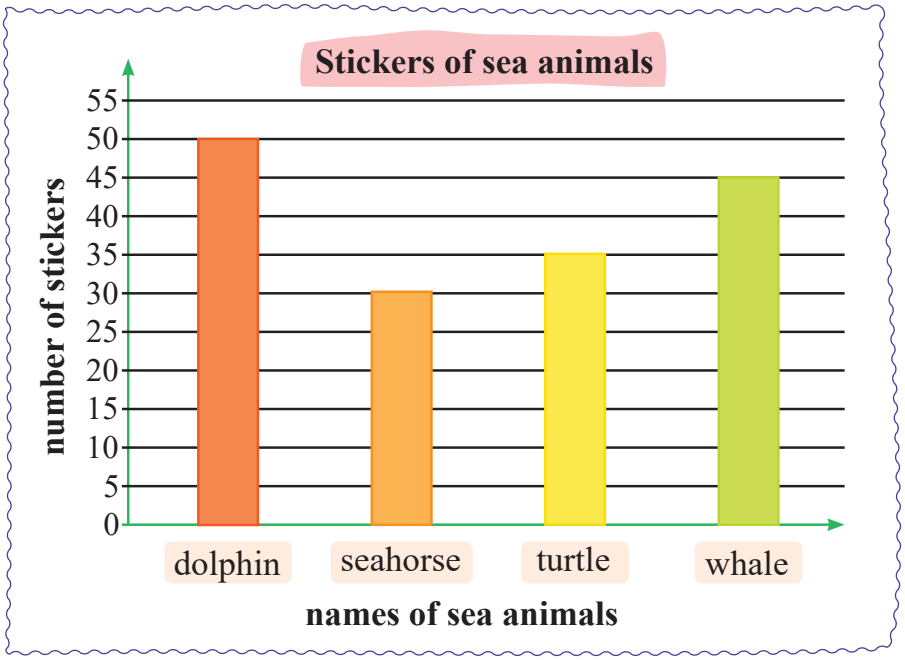
(e.) Distance travelled on Tuesday = 6 km

Distance travelled on Saturday = 5 km

Total distance travelled = (6 + 5) km = 11 km

Progress Meter 2

1. The bar graph represents Yuvraj's collection of different sea animal stickers. Read the bar graph and answer the following questions.



(a.) Yuvraj possesses 45 stickers of which sea animal?

(b.) How many turtle stickers does he have?

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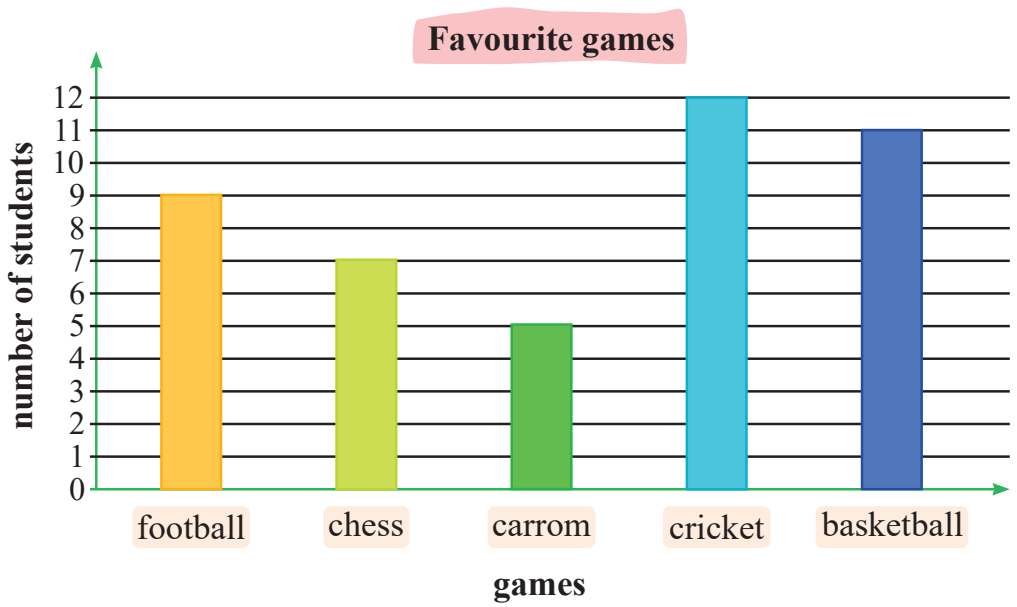
(c.) How many stickers of seahorses does he have?

(d.) Yuvraj possesses the most stickers of which sea animal?

(e.) Which sea animal stickers are 5 less than dolphin stickers?

(f.) Find the total number of stickers.

2. The bar graph below represents the favourite games of some students in a class. Based on the graph, answer the following questions.



(a.) How many students like carrom?

(b.) How many students like chess?

(c.) Which game is liked by 9 students?

(d.) How many more students like basketball than football?

(e.) Which game is liked by the most number of students?

(f.) How many students like cricket and football together?

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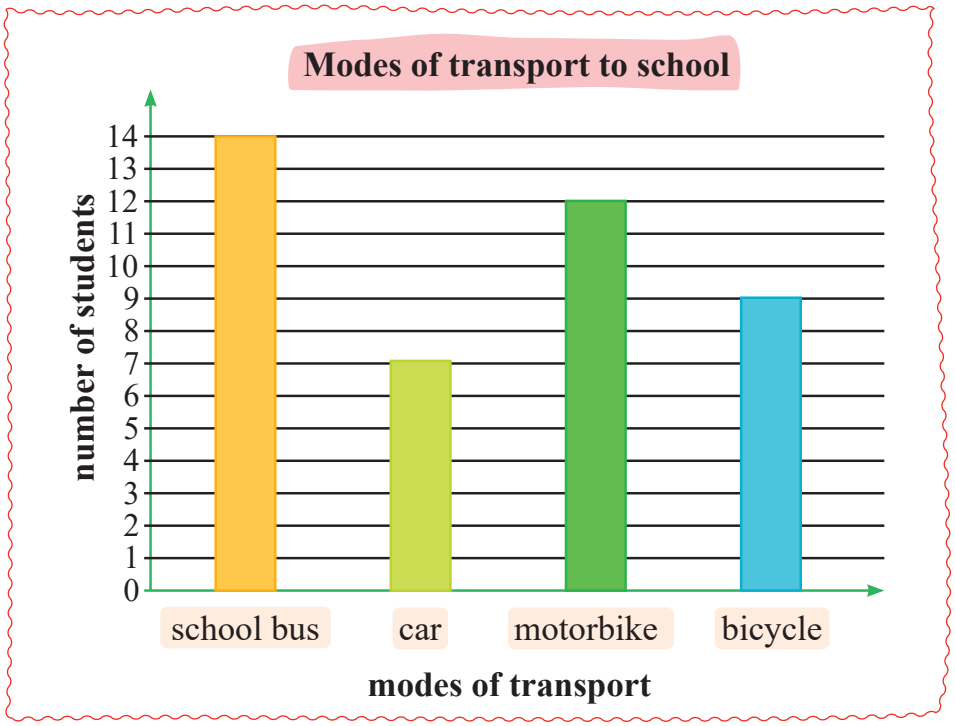
3. A group of students at the Mountain High School made a bar graph to show how they travel to school. Read the bar graph and answer the following questions.



(a.) How many students travel by car?

(b.) How many students ride their bicycles to school?

(c.) Which mode of transport do the students prefer the most?

(d.) Find the total number of students who travel by motorbike and bicycle.

(e.) How many more students travel by school bus than by car?

(f.) Which mode of transport is used by 9 students?

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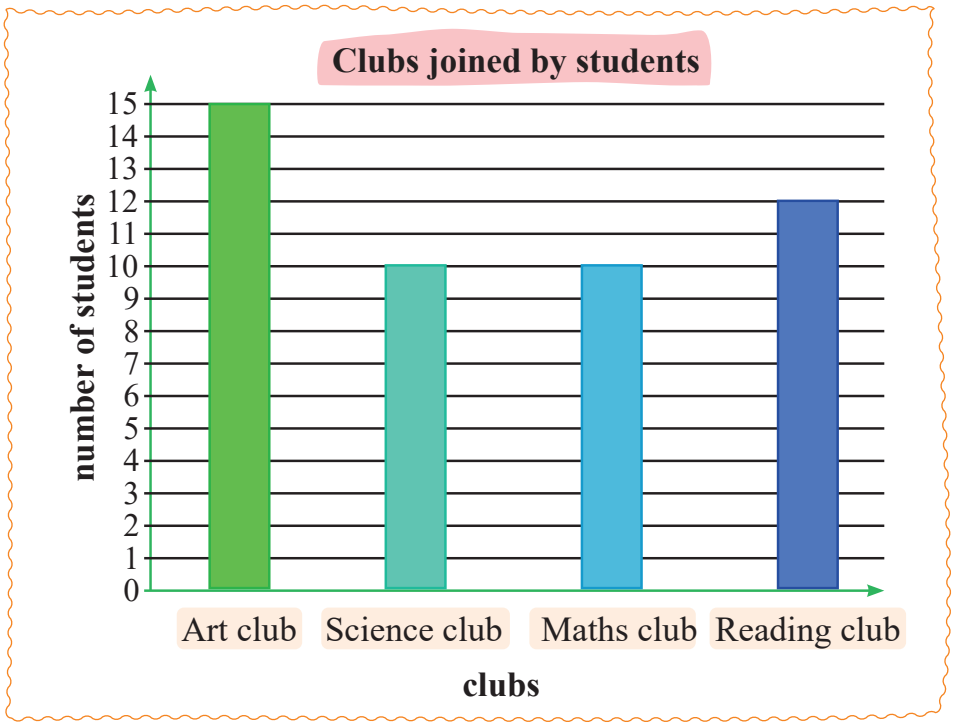
4. The following bar graph represents the clubs joined by some students. Read the bar graph and answer the given questions.



(a.) How many students joined the Science club?

(b.) Which club has the most number of students?

(c.) Which club has the same number of students as the Maths club?

(d.) How many students joined the Reading club?

(e.) How many fewer students joined the Reading club than the Art club?

(f.) Find the total number of students who joined the Science and Maths clubs.

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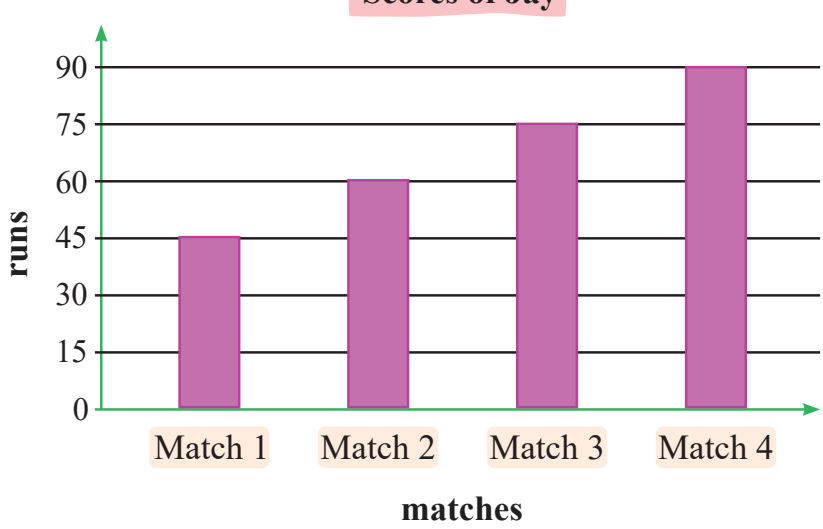
Mental Maths

1. The following bar graph shows the runs scored by Jay in 4 matches. Study the bar graph and answer the following questions.



(a.) By how many runs did Jay's score increase in every match?

(b.) Jay's team won the match in which he scored the fewest runs.

Which match did they win?

(c.) In which two matches did he score 105 runs altogether?

(d.) In which match did he score twice as many runs as in Match 1?

2. The given table and the pictograph represent the data on the number of bottles of honey produced in a factory in 4 days. Find the key to the data.

Days	Number of honey bottles
Monday	24
Tuesday	12
Wednesday	18
Thursday	12

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Production of honey

Days	Number of bottles of honey
Monday	
Tuesday	
Wednesday	
Thursday	

key:  = ☐ bottles

Maths Connect

Materials that are obtained from nature are called natural materials, whereas materials made by man are called man-made materials. Wood, metal and rubber are some of the natural materials, and plastic, glass and paper are some of the man-made materials that we use in our day-to-day lives.

Ram made a list of the materials that are used for different objects in his room. Use the data and make a pictograph using the given key.

Material	Number of objects
plastic	25
metal	10
glass	20
rubber	15
wood	5

key:  = 5 objects

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Fun Time

The given data shows the number of books on different subjects in a library. Make a pictograph to represent the data with a suitable key. Draw and colour a shape of your choice as a symbol for the key.

Subject	Number of books
English	25
Mathematics	30
Science	45
Hindi	20
French	15

key: ☐ = ☐ books

Number of books

English

Mathematics

Science

Hindi

French

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Exercise

1. Use the table given below to draw a pictograph.

Favourite drinks	
Drinks	**Number of people**
milk	20
tea	30
coffee	25
lemonade	15

key:  = 5 people

2. The table below shows the number of plants of each type in a vegetable garden. Represent this data using a pictograph and a suitable key.

Number of plants in a vegetable garden	
Vegetable	**Number of plants**
tomato	10
carrot	16
cucumber	6
radish	12
potato	8

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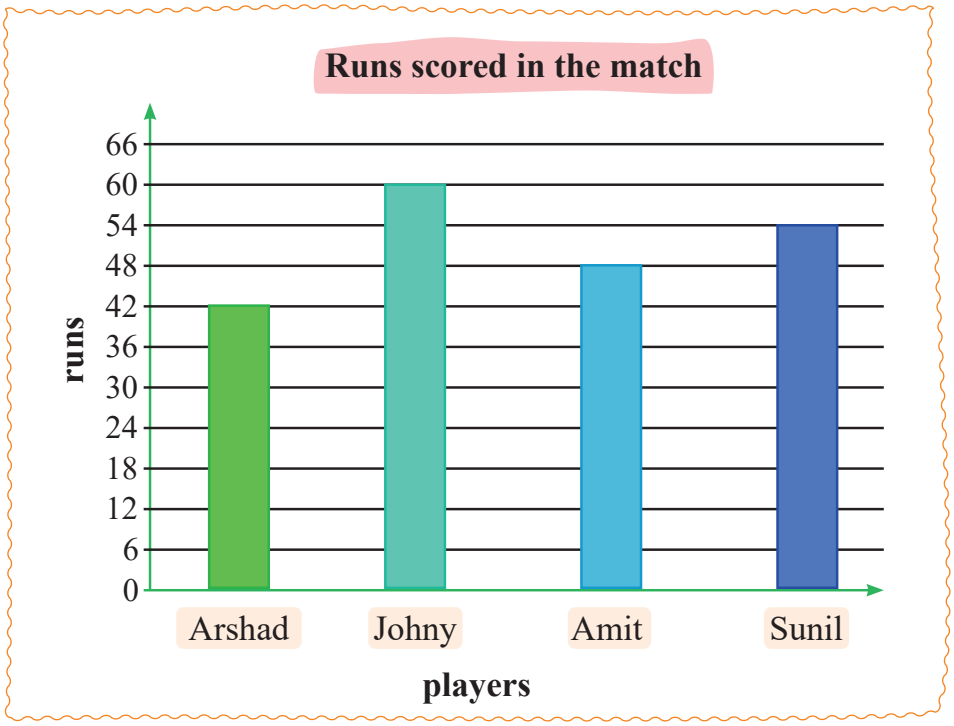
3. The bar graph below represents the runs scored by some players in a cricket match. Use the bar graph to answer the following questions.



(a.) How many runs did Arshad score?

(b.) How many runs did Sunil score?

(c.) Who scored the most runs?

(d.) Who scored 48 runs?

(e.) What is the total number of runs scored by all 4 of them?

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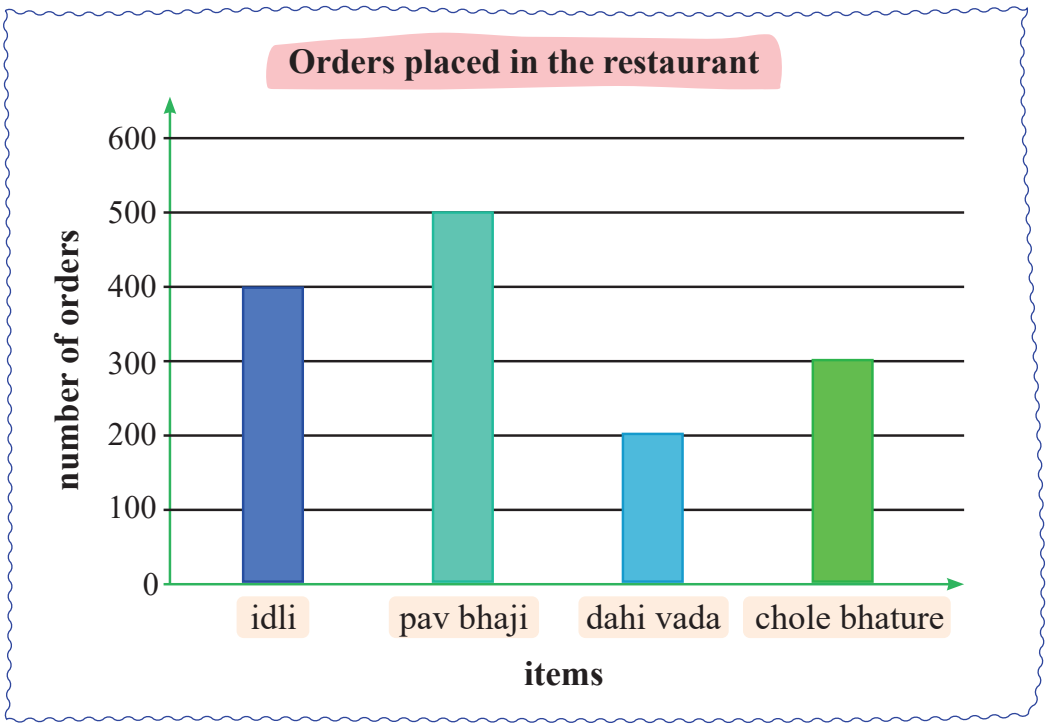
4. The bar graph represents the number of orders placed in a restaurant on a certain day. Read the bar graph and answer the following questions.



(a.) Which food item was ordered the least?

(b.) Which item was ordered more, idli or chole bhature?

(c.) Find the total number of orders placed in a day.

(d.) Which food item was ordered the most?

(e.) Which food item has 200 more orders than dahi vada?

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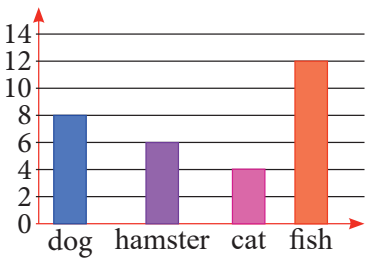
5. Choose the correct options.

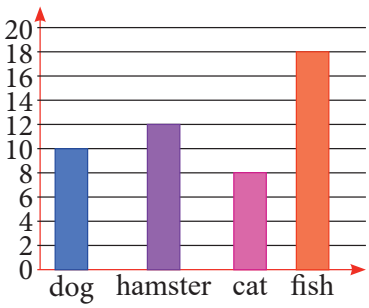
(a.) Which of the following shows the correct bar graph of the given data?

Number of pets in a pet shop	
Pet	**Number of pets**
dog	10
hamster	12
cat	8
fish	18

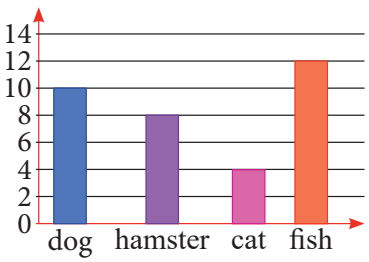
i.



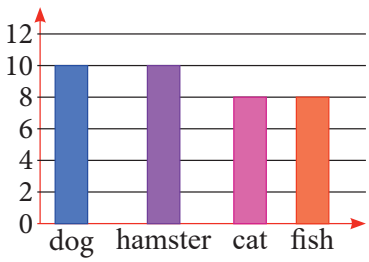
ii.



iii.



iv.



(b.) The given pictograph represents the votes of students for their favourite birds. How many votes did the robin get?

Favourite birds	
blue jay	
robin	
seagull	

key:  = 2 votes

i. 6 ii. 12 iii. 8 iv. 10

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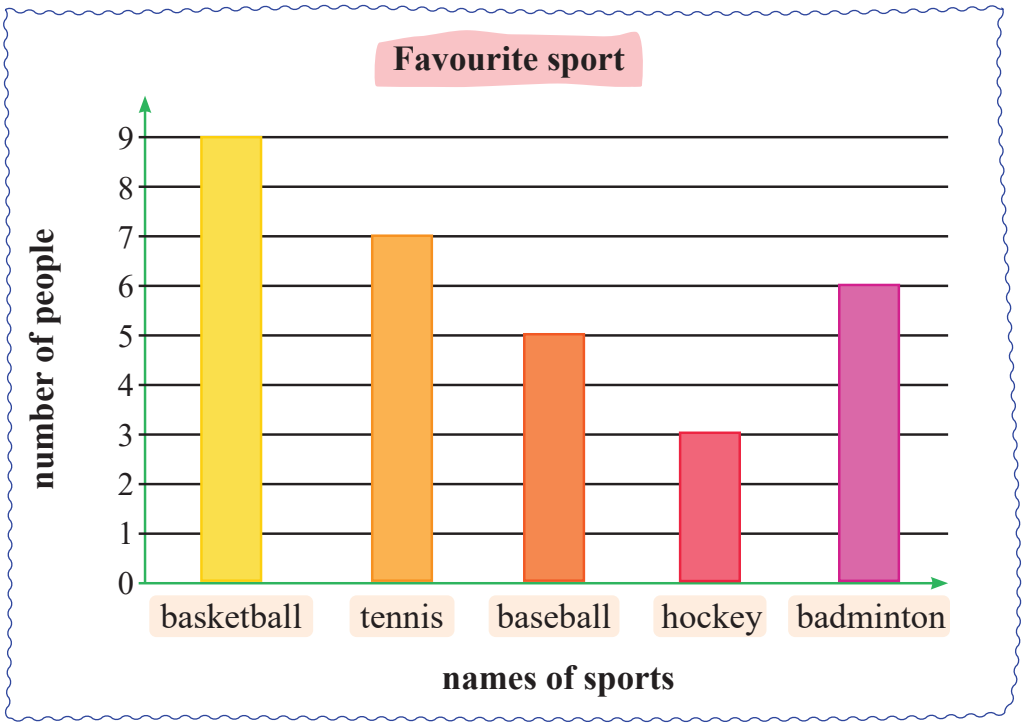
c. The bar graph below shows the favourite sports of 30 people. Based on the graph, which is the favourite sport of exactly 5 people?



i. basketball ii. tennis iii. baseball iv. hockey

d. The pictograph below shows the number of rounds that some athletes ran in a day. How many rounds did Raj run?

Sports practice	
Name	**Number of rounds**
Raj	5
Manu	3
Sanju	4
Kriti	6

key: = 2 rounds

i. 6 ii. 12 iii. 8 iv. 10

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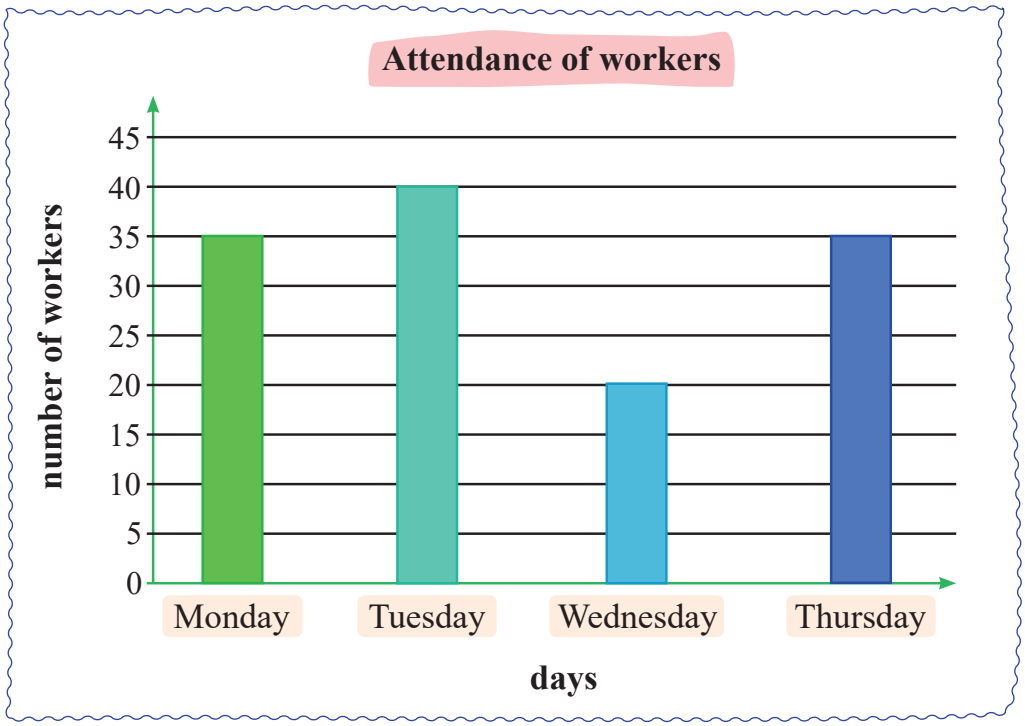
e. The given bar graph represents the attendance of workers in a factory from Monday to Thursday. How many fewer workers came on Wednesday than on Monday?



i. 15 ii. 20 iii. 25 iv. 10

f. The given pictograph shows the number of ice creams sold on a certain day. Find the total number of ice creams sold on the day.

Ice creams sold

Flavours	Number of ice creams
Vanilla	7
Chocolate	5
Coffee	6
Pistachio	4

key: = 10 ice creams

i. 125 ii. 220 iii. 185 iv. 250

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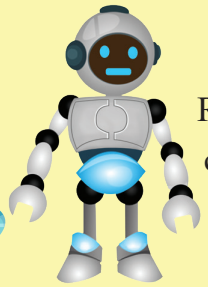
Think Class



Rohan's robot wants to check Rohan's understanding of the concepts of data handling he has learnt so far. It asked him the following questions. Help Rohan solve them.

1. Radha can type 25 words in one minute. The given data shows the time for which she typed on the given days. Make a pictograph to represent the number of words she typed from the data given.

Day	Time (minutes)
Monday	20
Tuesday	8
Wednesday	10
Thursday	6
Friday	12

key: ◠ = 50 words

Number of words typed

Monday

Tuesday

Wednesday

Thursday

Friday

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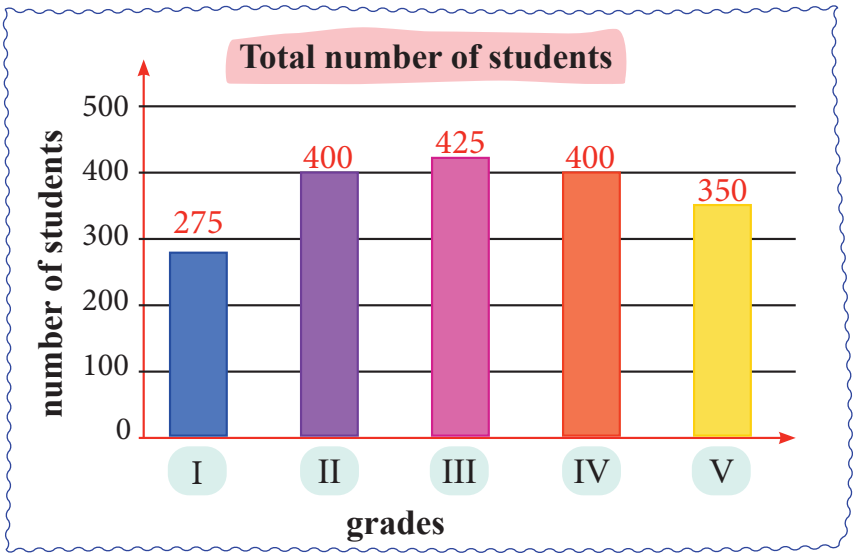
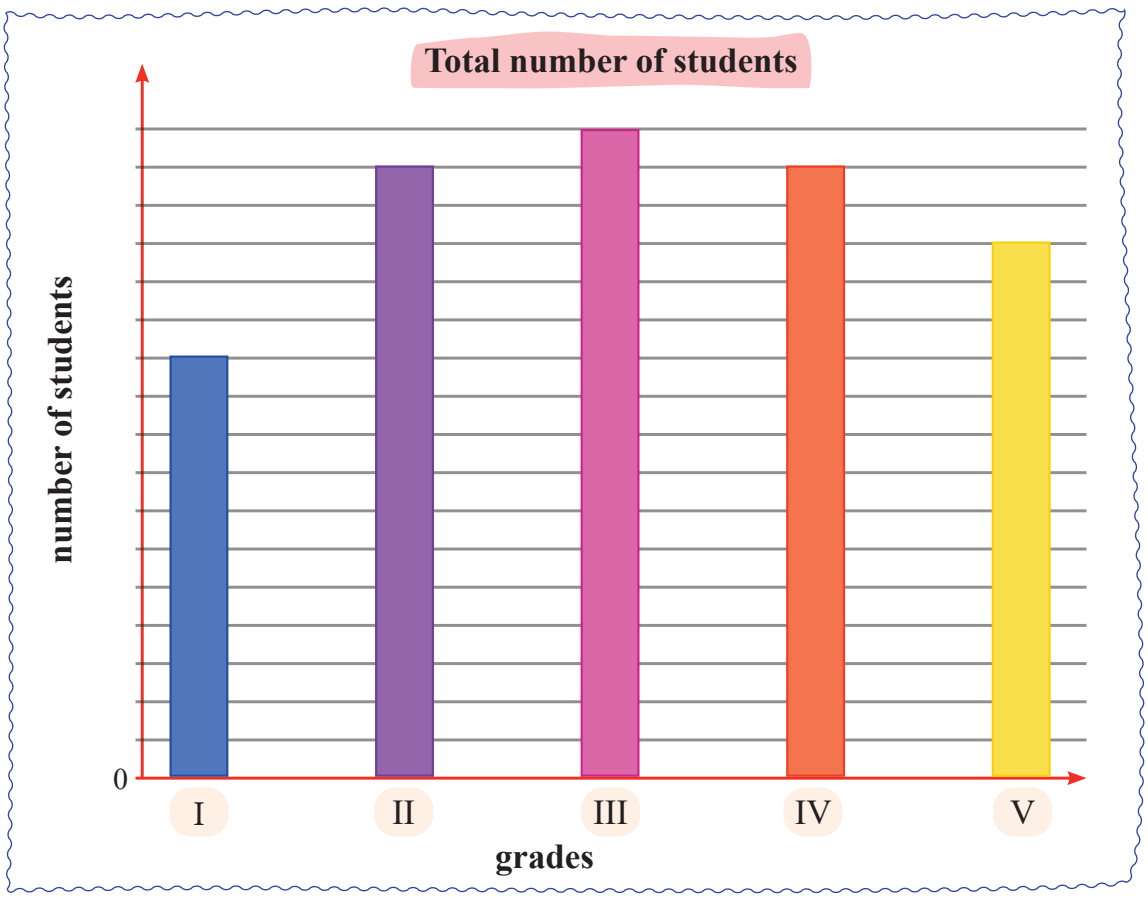
2. Riya made the following bar graph for the number of students in grades I–V.



She made the bar graph again using a different scale. Observe the bar graph below and write the scale she used on the vertical axis.



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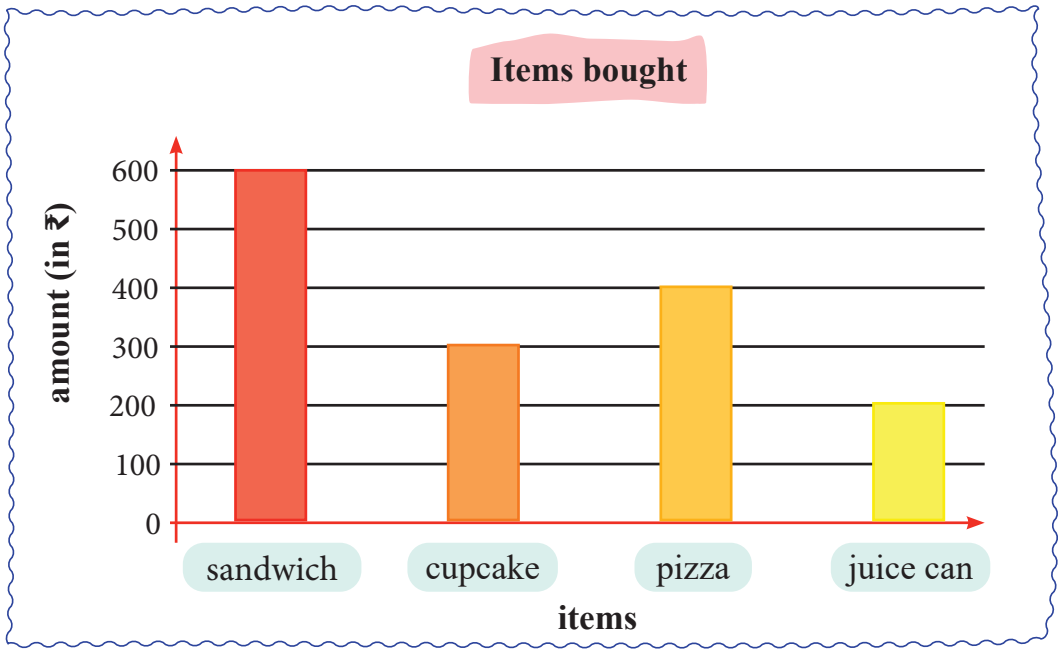
3. Sam bought some food items for his birthday party. The following bar graph shows the amount of money he spent on buying each item.



The table below shows the number of items bought. Observe the bar graph and complete the table to find the cost of each item.

Items	Number of items	Cost of each item
sandwich	30	
cupcake	25	
pizza	4	
juice can	20	

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