15

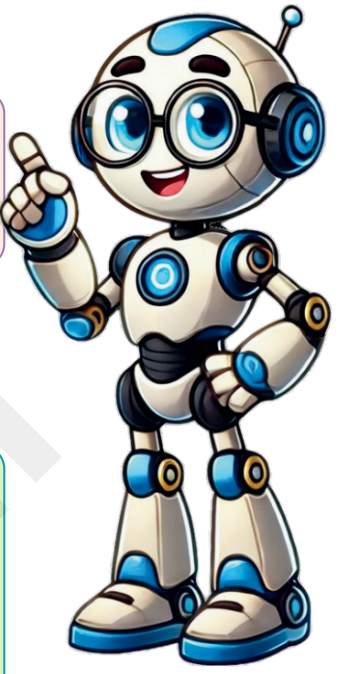
Data Handling

We'll cover the following key points:

→ Introduction

→ Bar Graphs

→ Reading and Interpretation of Bar Graph



Hi, I'm EeeBee

Do you Remember fundamental concept in previous class:

In class 3rd we learnt

→ Pictorial Representation of Data

In class 2nd we learnt

→ Representing Data

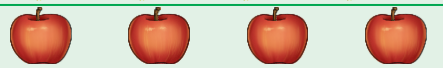
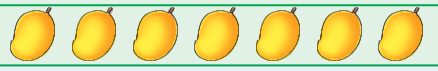
Still curious? Talk to me by scanning the QR code.

Learning Outcomes

By the end of this chapter, students will be able to:

- Understand what data is and how to collect information (e.g., counting how many students like different fruits).
- Organize data using tally marks (e.g., using tally marks to count the number of pets in a class).
- Create and read simple bar graphs to represent data (e.g., making a bar graph to show the number of students in each class).
- Interpret information from pictographs (e.g., reading a pictograph where each picture represents 5 items).
- Draw a bar graph or pictograph based on given data (e.g., making a bar graph from the number of apples, bananas, and oranges).
- Understand the concept of average (e.g., finding the average number of books read by students in a month).

1. The following pictograph shows the number of various fruits in a shop.

Fruit	Number of fruits
Guava	
Banana	
Orange	
Apple	
Mango	

Key : 1  means 10 fruits

Read the above pictograph and answer the following questions:

(a) Name the fruit which is in the smallest quantity.

(b) How many apples are there in the shop?

(c) How many oranges are there in the shop?

(d) Find the difference between bananas and mangoes.

2. The following pictograph shows the number of students opting different subjects:

Subject	Number of Students
History	
Drawing	
Math	
Economics	
Science	

One  (icon) = 10 students

Read the above pictograph and answer the following questions:

(a) Find total number of students who favoured Math and Science.

(b) How many students favoured Drawing?

(c) Which subject was favoured by maximum students?

(d) Which subject was favoured by minimum students?

Introduction

Data is the information about an object and graph is the pictorial representation of data. You have already learnt in the previous class to represent or illustrate given information (data) in **words**, **symbols**, through **graphs**, **pictures** etc. The representation of information through **graphs**, **pictures**, **symbols** and **points** are used. Now we shall learn how to read and interpret the pictographs (pictograms). If we make use of picture symbol for representing information then it is called **pictorial representation** or **pictographs** of given data.

The picture that represent information are known as **pictographs**.

Let us consider some examples to understand pictograph clearly :

Example 1: The pictograph given below showing the total collection of books in a library on different subjects.

Mathematics	
Physics	
Hindi	
Urdu	
English	

One  represents 100 such books.

Answer the following questions :

1. Which books are equal in number in the library?
2. Which subject has minimum number of books in the library and how much?
3. What is the total number of books in the library?
4. Which subject has minimum number of books?

Solution:

(a) Hindi books and English books are same in number in the library?

(b) Mathematics books are maximum in number in the library.

Number of Mathematics book = $5 \times 100 = 500$

Physics books = $4 \times 100 = 400$

Hindi books	=	3 × 100	=	300
Urdu books	=	2 × 100	=	200
English books	=	3 × 100	=	300
Total books			=	1700

(c) Urdu books are minimum in number in the library.

Number of Urdu books = 2 × 100 = 200

Example 2: Following is the number of women using cosmetics in a city in different years.

Years	2015	2016	2017	2018
No. of women using cosmetics in a city	5000	7000	8000	10000

Draw a pictograph to represent the above data.

Solution: Let  represent 1000 women.

Now, the required pictograph is drawn below.

Years	**No. of women using cosmetic in a city**
2015	
2016	
2017	
2018	

Bar Graphs

Pictographs give a quick representation about the relationship between quantities. However, the representation of numerical data in pictographs is time consuming and therefore not very practical.

A pictorial representation of the numberal data by a number of bars (rectangles) of uniform width erected horizontally or vertically with equal spacing between them are known as bar graphs.

Each rectangle on bar represents only one value of the numerical data. So, there are as many bars as the number of values in the numerical data. The height or length of

Take a Task

Watch Remedial

bar on a suitable scale indicates the corresponding value of the numerical data.

In order to draw a bar graph, we draw two mutually perpendicular lines on the plane paper. The horizontal line is called **x-axis** and the vertical line is called **y-axis**. If the bars are drawn vertically on the horizontal line (x-axis), the scale of height of the bars on rectangles is shown along y-axis, If the bars are drawn horizontally on the vertical line (y-axis), the scale of heights of the bars on rectangles is shown along x-axis. The bars can be **shaded**, **hatched**, or **coloured**.

Construction of Bar Graph

Following points should be kept in mind while constructing a bar graph :

- The width of the graph should be uniform throughout.
- The gap between one bar and another should be uniform throughout.
- Bars may be either horizontal or vertical. The vertical bars should be preferred because they give a better look.

To construct a bar graph, a suitable scale has to be decided on either axis, so that length or height of bars are easily represented in the graph.

Reading and Interpretation of Bar Graph

The first step in reading a bar graph is to know what it represents and what is the information given by it. We need to read the captions which are generally written just above the horizontal line (x-axis) and adjacent to vertical line (y-axis). After knowing that what does a bar graph represent, we read the scale so that we can know the precise values in the given data.

After reading a bar graph, one must be able to draw certain conclusion.

Drawing some conclusions from a given bar graph means interpretation of the bar- graph.

Horizontal Bar Graph

The following table shows the data related to number of students of Class IV passed in each subject. Let us first, draw a horizontal bar graph to represent the data and then, answer some questions given below.

Subjects	Maths	General Science	Social Science	Hindi	English
No. of Students Passed	40	80	60	70	50

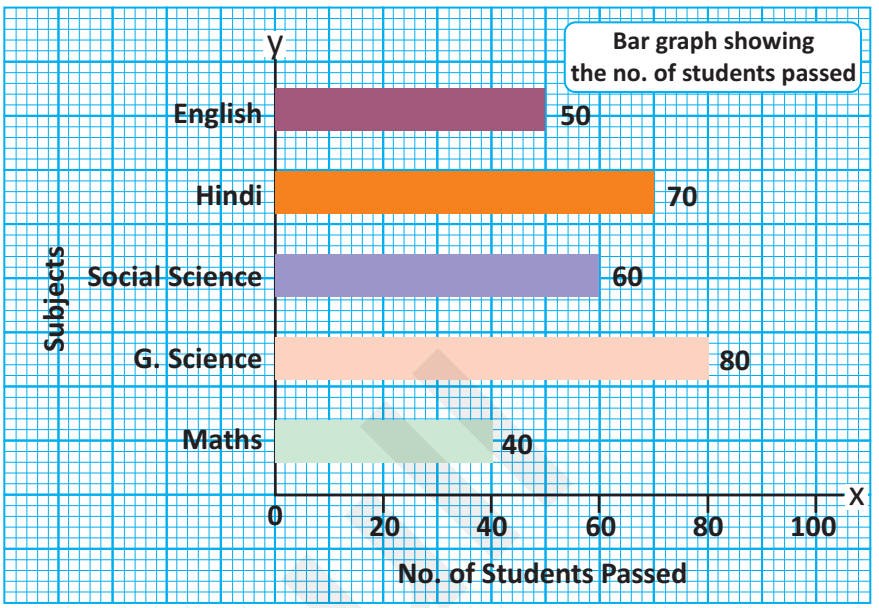
(i) What is the general information given by the bar graph?

(ii) In which subject maximum number of students are passed?

(iii) In which subject the least number of students are passed?

(iv) What is the subject in which 20 less than 100 students are passed?

The required horizontal bar graph is drawn below.



(i) The bar graph in general represents the number of students passed in each subject.

(ii) General Science is the subject in which the maximum number of students passed (80).

(iii) Maths is the subject in which the least no. of students passed (40)

(iv) 20 less than 100= 100 –20 = 80. In Hindi, 80 students are passed.

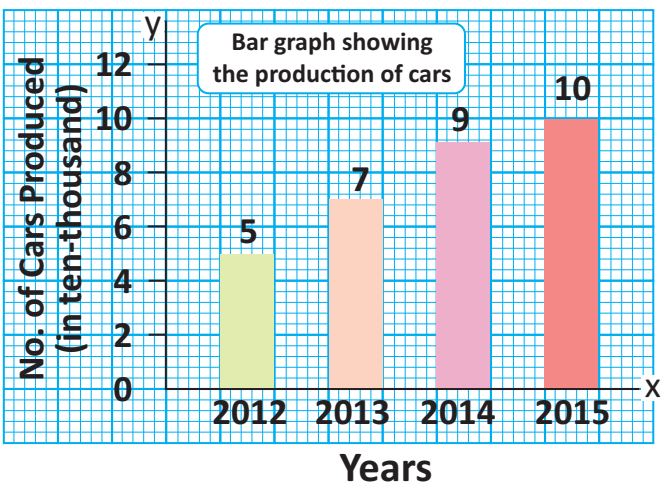
Vertical Bar Graph

The following data show the number of cars produced in different years. Let us draw a vertical bar graph to represent the data.

Years	2012	2013	2014	2015
No. of cars produced (in ten-thousand)	5	7	9	10

The required vertical bar graph is drawn below.

Now, read the bar graph carefully and let us draw some conclusions:

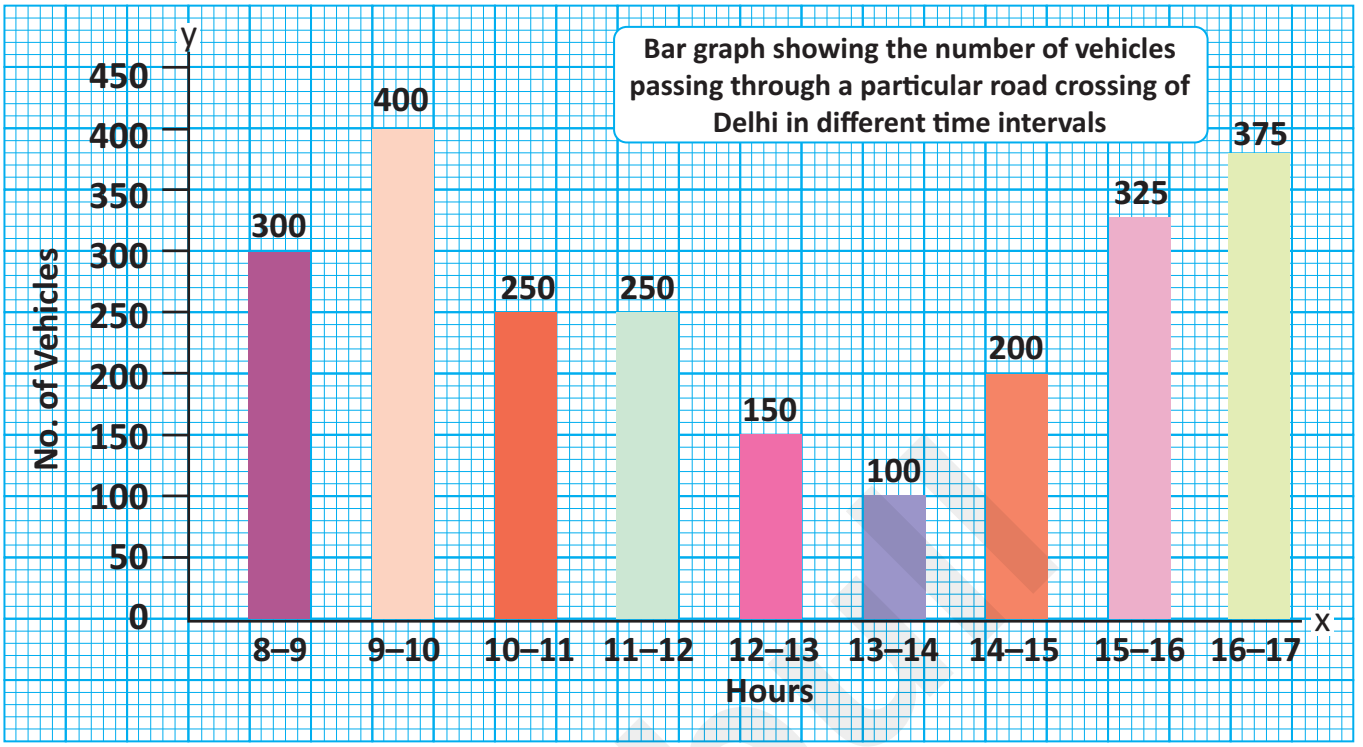


(i) The bar graph in general represents the number of cars produced in the car factory for four consecutive years.

(ii) The maximum number of cars were produced in the year 2015. The maximum number of cars produced is 1,00,000.

(iii) The production of cars during the year 2015 is exactly double of the production during the year 2012

Example 3: The following bar graph shows the number of vehicles passing through a road crossing in Delhi in different time intervals on a particular day.



Read the bar graph and answer the following questions :

(i) What does the bar graph represent?

(ii) When is the traffic maximum? Also, give the maximum number of vehicles.

(iii) When is the traffic minimum?

(iv) What is the total number of vehicles passed through the crossing during the particular day?

Solution :

(i) The bar graph represents the no. of vehicles passing through a road crossing of Delhi in different time intervals on a particular day.

(ii) The maximum traffic is between 9 and 10 hours. The number of vehicles crossed is 400.

(iii) The minimum traffic is between 13 and 14 hours. The number of vehicles crossed is 100.

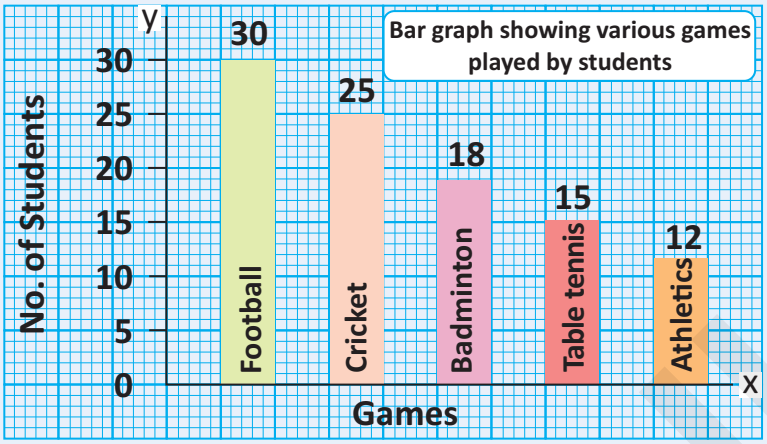
(iv) Total no. of vehicles passed through the crossing during the day = 300 + 400 + 250+ 250 + 150+ 100 + 200 + 375 = 2025.

Project Work

Critical Thinking

Collect the data of highest marks of class 4 botained in Math's subject in different years. Note them and draw the bar graph to represent this data. You may consult with your teacher for this.

1. In a school, data collected for various games played by the students are shown in the bar graph given below.



Read the bar graph carefully and answer the following questions:

(a) How many students play Table tennis?

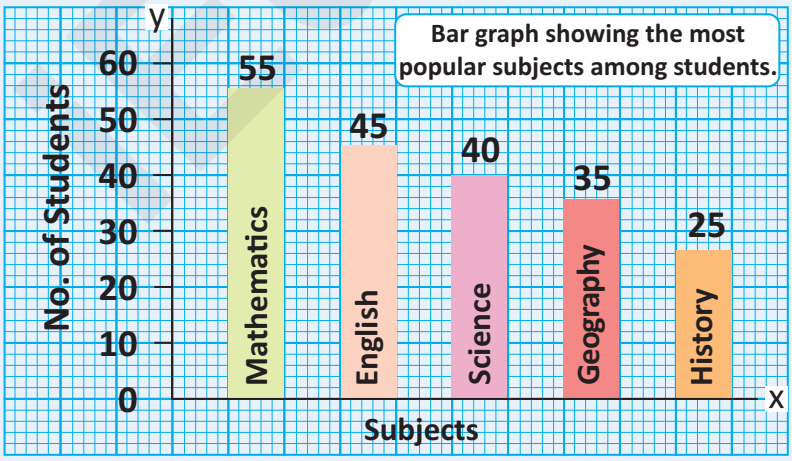
(b) How many students play Badminton?

(c) How many students play Cricket?

(d) Which game is played by most of the students?

2. In a class, data collected for the most popular subjects among the students is shown in the following bar graph :

Read the bar graph carefully and answer the questions that follow:



(a) Which subject is most popular among the students?

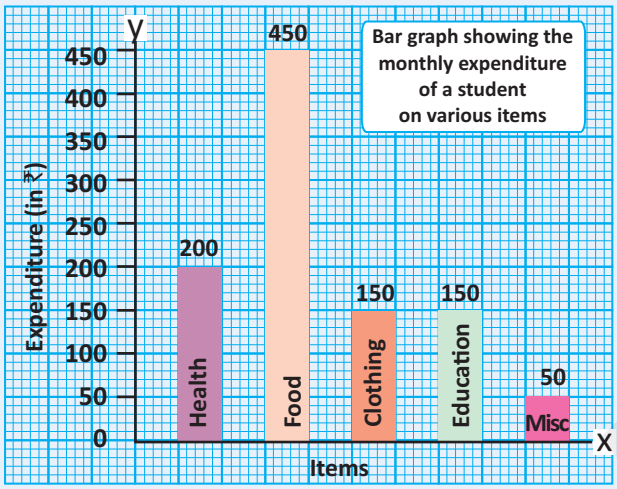
(b) What is the difference between the numbers of students liking Mathematics and History?

(c) Which subject is least popular among the students?

(d) How many students like science?

3. A students monthly expenditure on various items is shown through the bar graph given below :

Read the bar graph carefully and answer the following questions:



(a) How much money is spent on health?

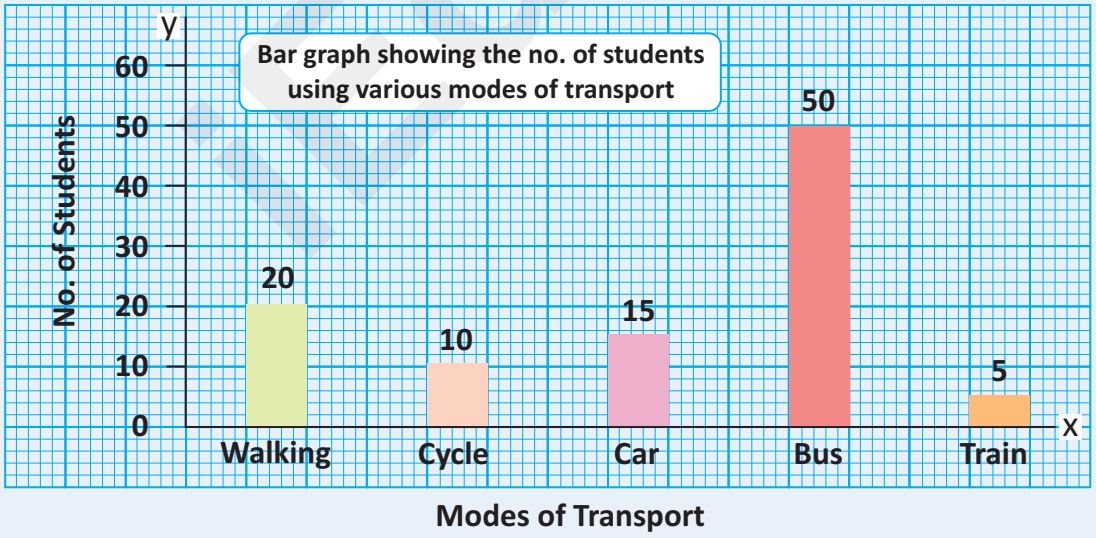
(b) How much money is spent on clothing and education?

(c) On which item maximum money is spent?

(d) How much money is kept for miscellaneous items?

4. In a certain school, the number of students using various modes of transport is shown in the bar graph given below :

Read the bar graph carefully and answer the following questions:



(a) How many students use cycle?

(b) How many students go to school by walking?

(c) Which mode of transport is used by most of the students?

(d) Which mode of transport is used by the least students?

LET US SUMMARIZE

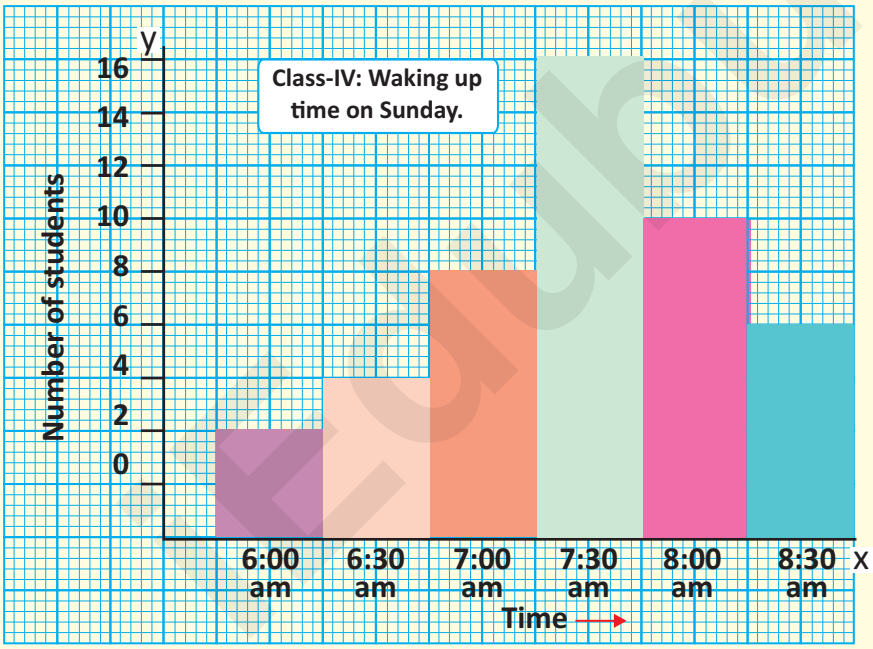
- Pictograph is pictorial representation of data.
- A bar graph must have a title.
- The bar graph must have horizontal and vertical scales.
- The vertical bars should be preferred because they give a better look.

Think Tank

Gap Analyzer™

1. Multiple Choice Questions (MCQs)

Tick (✓) the correct option.



(a) What is at the horizontal scale in the graph?

(i) Time ☐ (ii) Number ☐ (iii) Both ☐ (iv) None of these ☐

(b) At what time do the most of the students get up on Sunday?

(i) 7:00 a.m. ☐ (ii) 7:30 a.m. ☐ (iii) 8:00 a.m. ☐ (iv) 8:30 a.m. ☐

(c) What is the total number of students in class -IV?

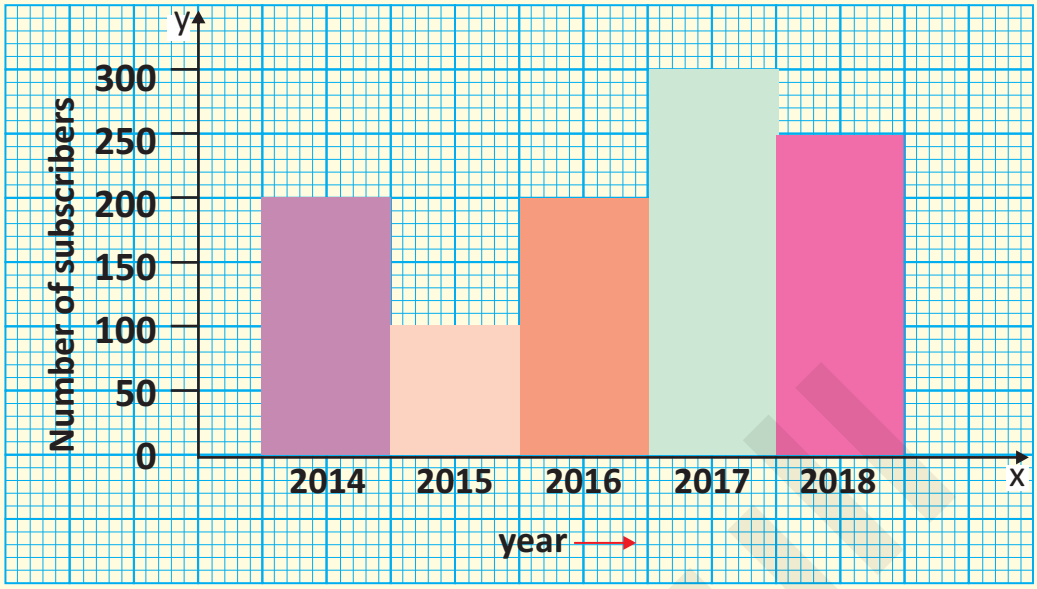
(i) 40 ☐ (ii) 24 ☐ (iii) 46 ☐ (iv) 44 ☐

(d) How many students get up at 6.30 am on Sunday?

(i) 10 ☐ (ii) 16 ☐ (iii) 4 ☐ (iv) 8 ☐

2. The following bar graph shows the number of new subscribers a children's newspaper got every year.

Answer the following questions :



(a) Give the bar graph title.

(b) What is on the vertical scale of the graph?

(c) In which year did the newspaper have the maximum number of subscribers?

(d) How many more new subscribers did they have in 2018 than in 2015.