
UNIT 10 VISUAL AIDS

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10.0 OBJECTIVES

In this Unit we turn to another mode of expression - communication by means of visual aids. Our aim, in this unit would be to help you interpret and analyse tables, charts, graphs. We shall also give you practice in condensing written material into graphs and tables.

After you complete the unit, you would be able to make effective use of visual materials, as well as interpret them.

10.1 INTRODUCTION

We have, in the various units of this block so far, discussed the skills of written communication. We have also looked at the study skills of note-taking and summary writing. In this unit, we shall discuss a method of communication by means of visual aids, such as tables, charts, graphs, so on. These devices supplement the information presented through words, and help the reader to understand the facts and figures more easily.

10.2 THE FUNCTION OF VISUAL AIDS

Tables, charts and graphs - collectively called visual aids - often convey a message or piece of information better than words. There are several functions which can be performed by these visual aids. We shall enumerate some of them.

- The use of tables, charts, and graphs enables you to highlight the mainpoints of the information contained in the text.
- These devices enable you to make vivid comparisons and show the relations between facts.
- They help to summarise data and ideas, and simplify and arrange complicated details so that the reader can easily follow them.

They enable you to present the information more concisely. Writing on a complicated topic can take up several pages. While the same information can be presented in less space by a table or a chart.

They also allow you to repeat the information you have discussed, by presenting it a second time, but in a different form. Readers thus, encounter the data twice, once in the written material and once again in the related visual. This reinforces the point that you make, and there is an increased possibility that the reader will understand and remember what you have written.

10.3 USING VISUAL AIDS

When you decide to use tables, charts, and graphs, you should keep the following points in mind:

- While planning your entire writing project, keep in mind the tables, charts, and graphs and where you can incorporate them. This will help you in the long run, and give clarity to your thoughts.
- Therefore, while you are still searching for information, identify concepts and data that will lend themselves to representation through tables, charts, etc.
- Pay special attention to those ideas or data that will present difficulties to your reader. It will be a good idea to present some of the 'difficult' items through tables, charts, etc.
- It is wise to use a fresh illustration each time you need one. The use of ready-made graphs or photographs will not always be so relevant to the point you are making.

10.4 TABLES

A table is a collection of figures, facts, or other information arranged in columns and rows. The readers locate the information they need by reading across a row, and up or down a column. So when you design tables your major concern is to provide adequate spacing between columns and rows, so that your readers can find the information easily. You will find that tables are useful for a number of things.

- They can show large numbers of specific data in a brief space. If such data were presented in the text itself, the reader would have to go through a succession of figures occurring in the text.
- Tables eliminate tedious repetition of words, phrase and sentence patterns that can be put at the top of columns, or at the side of rows in the table.
- Because a table displays its information in rows and columns it can be useful for juxtaposing data in two or more dimensions. This enables the reader to easily compare and contrast the data. Example 1 below tells you what is meant by a column and a row. It also shows the comparison between different elements on the basis of three dimensions.

Example 1

Information concerning five elements

	Column 1	Column 2	Column 3	Column 4	Column 5
	Name of element	Symbol	Atomic weight	Number of protons and neutrons	Melting point
Row 1	Lithium	Li	6.94	3p 4n	179°C
Row 2	Magnesium	Mg	24.312	12p 12n	651°C
Row 3	Sulphur	S	32.064	16p 16n	112.8°C
Row 4	Boron	B	10.911	Sp 6n	2300°C
Row 5	Calcium	Ca	40.08	20p 20n	845°C

(*A Course in Intermediate Scientific English* by Frank Chaplin, Table 2, 43).

Tables can be divided into two broad types: dependent tables and independent tables.

A dependent table is an integral part of the text. It needs no title or caption because it is given in continuation of the text. Such a table should contain a small amount of information, probably a maximum of three columns and rows, and a dozen or so numbers. An example of a dependent table is given below:

Example 2

The State Government's contribution of 50 percent is provided from the State budget into a Fund set up for the purpose known as the FAE (Water Supply & Sewerage Fund). It is a revolving fund inasmuch as the repayments of loans are also credited to the fund for resource generation. Each State Government is expected to contribute up to 5 percent of its revenues from taxation to the FAE subject to a minimum of 2 percent. When the State Government is unable to fulfil its commitment due to resource constraints, the BNH provides a supplementary line of credit to the State Government to make up the shortfall in contribution to the following extent:

State Contribution	BNH supplementary allocation
3.5 to 4.5 percent	1 percent
3 to 3.5 percent	0.75 percent to 1 percent
2 to 3 percent	0.5 to 0.75 percent
Below 2 percent	Nil

BNH charges 1 percent interest more than the normal rate for such supplementary contributions.

An independent table may be placed physically within the text but should be clearly distinguished from it.

(Example 3 below)

Example 3**Resurgence in Bihar**

In 1977, a sample survey conducted by the National Institute of Communicable Diseases (NICD), estimated the number of Kala-azar cases to be 70,000 with 4,500 estimated deaths. However, 18,589 cases and 229 deaths were detected through searches while during 1978 and 1979, 41,953 and 25,172 cases respectively were detected. In the latter year, the figures relate to only those which came to Health Centres/hospitals for treatment, hence the figures are low. The number of cases and deaths recorded due to Kala-azar since 1977 are given in Table 1.

Table 1

Number of Kala-azar cases and deaths in Bihar State.

Year	No. of cases	No. of deaths
1977	18589	229
1978	41953	62
1979	25172	28
1980	13620	23
1981	14165	35
1982	11120	35
1983	11832	128
1984	12983	67
1985	12029	37
1986	14029	47
1987	17471	74

(From : Kala Azar : Re-emergence of a Dreaded Disease VHA)

In an independent table, you are inviting your readers to look at the tabular information separately, while reading the text, generally, such tables can present a large amount of information. They require the reader to stop and reflect on the details about the facts and their arrangement. Such a table usually has a table number and a caption. The caption should be carefully written so that you focus the reader's attention on the significant facts presented in the table. Of course, a written summary of the facts presented in the table should also be given, highlighting the important facts.

In some cases a summary of the table is given in the text, and the full table is placed in the appendix.

It will be useful to keep certain points in mind when you prepare tables of your own.

- If you are using several independent tables, you should assign each table a table number (Look at Examples 1 and 3 again). In the text itself, each table should be referred to by the table number rather than by a phrase such as the table above.... If your text has more than five tables, they should be listed in a separates page after 'Table of Contents' labelled as 'List of Tables'.
- The title of the table can be placed either above or below the table. It should describe in very precise language the contents of the tables.
- Each column should have a heading. This heading should be brief but accurate. Units of measurement, if required, are enclosed beneath the heading. You may use the standard abbreviations, if you like. (See example 1 again.)
- In the left-hand vertical column of the table, we list the items about which information is given in the table.
- The main body of the table comprises the data below each heading in columns to the right of the left vertical column. It is very essential to present the information in the body as clearly as possible. The presentation of information clearly is dependent to a large extent on the way lines are drawn in independent tables. You can have a choice of an open design, a semi-closed design or a closed design. An open design is one, which has no vertical or horizontal lines in it (Examples 2 and 3). A semi-closed design has some vertical and/or some horizontal lines. A closed design has both vertical and horizontal lines separating virtually all the items (Example 1).

Check Your Progress 1

- On the basis of the information given in the following table, answer the questions given below.

Description of Some Cars

MAKE	PRICE	COUNTRY	ENGINE SIZE C.C	KM./LITRE
MAZDA	8,400	Japan	898	15
LADA	7,600	U.S.S.R.	972	10
FORD	9,200	U.S.A.	936	14
HONDA	8,100	Japan	870	17

- a) Which two cars have the most things in common?

(1 line)

.....
.....

- b) Which two cars are very unlike each other?

(1 line)

.....
.....

- c) Which car would be the best value?

(1 line)

.....
.....

2. Using the statistics given in the following table complete the paragraph below:

	1984	1985	1986	1987	1988
Production					
Consumption	1237	1320	1460	1570	1720
Raw Material					
Consumption (in Tonnes)	1100	1150	1270	1330	1400
Energy consumption					
KWH	6370	6200	5875	5625	5370
Modernisation					
Expenditure (in Lacs)	Nil	3	3	5	2
Gross Profit (in Lacs)	8	15	21	27	32

The table given above illustrates the effect of modernisation on an industry engaged in manufacturing. Over.....(i).....years, the company spent.....(ii).....lacs on its modernisation programme. This.....(iii)....the energy consumption dramatically. The first row shows a steady increase in(iv).....tonnes in 1988. The Company's.....(vii).....also showed a marked increase, from 8 lacs in.....(viii).....to(ix).....in.....(x).....

3. Read the paragraph given below. The data given in this form is obviously difficult to digest. Convert the data in the form of a table.

As of December 31, the Consolidated Electric Company had a total of 7,863 employees. Of these, 1,989 (or 25 percent) had less than five years service; 1,590 (or 20 percent) had five to ten years service; 1,275 (or 16 percent) had ten to fifteen years' service; 784 (or 10 percent) had fifteen to twenty years' service); 931 for 12 percent had ten to thirty years' service; 1,294 (or 17 per cent) of the employees had thirty or more years' service with the Consolidated Electric Company.

(From *Basic Technical writing*, Charles E. Merrill Publishing Company)

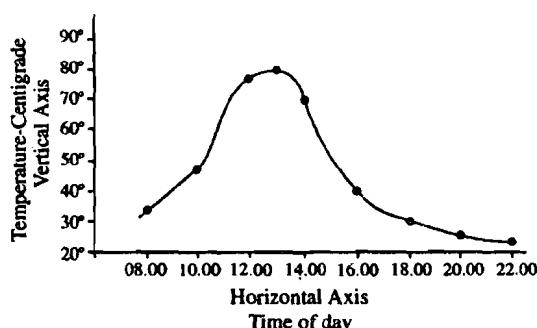
10.5 CHARTS AND GRAPHS

The term chart is used to refer to (i) a detailed map of a sea area, and (ii) information presented in the form of a picture or a graph to make it easily understood. We shall use it here in the latter sense. This presentation through diagrams and graphs can take various forms, including what is known as a flow diagram or a flowchart. These charts simplify the detailed information that is presented and help in its interpretation. Trends, movements and distributions can be presented in a more comprehensive manner in graphs than in tables.

10.5.1 Line Graphs

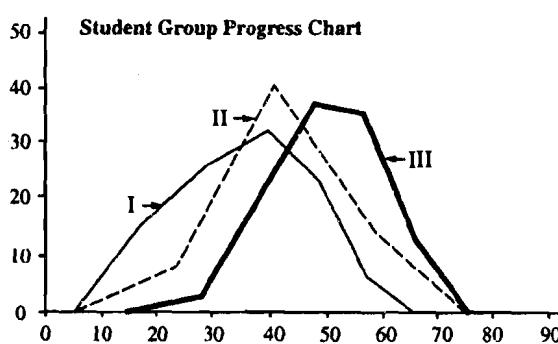
A graph is usually a straight or curved line, which is drawn between a vertical (that is, an upright) line and a horizontal (that is; a level line) across the page, to connect a series of points representing the varying values of two related things. It, thus, primarily shows the relationship between two sets of figures or two 'variables'.

The fixed lines—horizontal and vertical used as reference points are known as axes, each representing one set of figures or one variable (see example 4).



Soil surface temperature in September in wadhalfa, Sudan
A Course in intermediate Scientific English

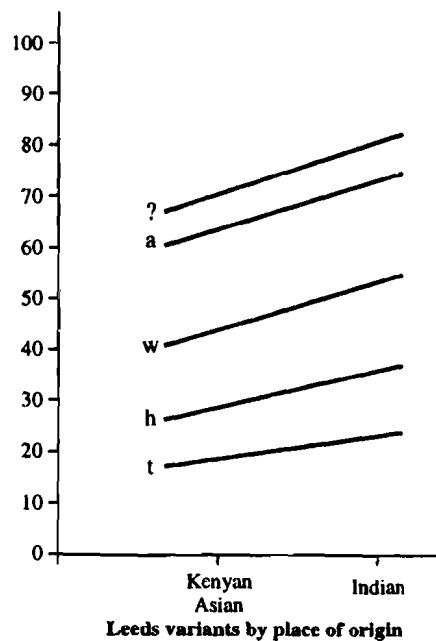
Example 5 below shows the use of number of lines in the same graph. In preparing such graphs each line has to be given a label. You can emphasise the difference between two lines by shading the space that separates them. In order to differentiate between the different lines, you can use, different colours, or a dotted line, a broken line, a semi-broken line, a thick line, a thin line, etc.



(From: *Testing Communicative Performance*, by B.J. Carroll)

The question that arises is: how many lines is it possible to accommodate comfortably in a graph? There can be no single correct answer. For instance the graph in Example 6 below has five lines in it, and yet it is not too cluttered. Why? Because the principal objective of presenting that graph is to show that the lines all move in a parallel direction. However, you will realise that if those lines had begun to move across one another, the load of information would be too great for a reader to absorb.

Example 6



	a	w	?	t	h
Kenyan Asian	58.91	42.73	65.35	18.86	27.14
Indian	74.10	53.31	79.62	24.36	35.80

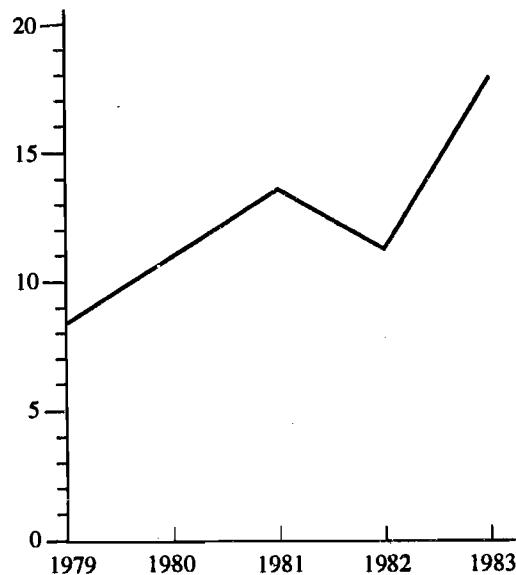
(From : *Crisis of Identity* – R.K. Agnihotri)

These line graphs are most useful for showing changes that have taken place (or are predicted) over a period of time, as in Example 4. When this is the purpose of the chart, the horizontal scale usually represents a time line, and the vertical scale represents the quantity being measured. In fact a line chart of the type in Example 4 will provide the readers with an immediate picture of general trends.

When you design a line chart you must be careful that you do not unintentionally misrepresent or distort your data. This may happen if you do not pay attention to the scales that you are using. Look at Examples 7 & 8 given below. They show the company's profit over a five year period. Example 7 gives the impression that the increase and decrease from year to year is rather modest. Example 8, on the other hand, appears to show more dramatic results. Now, why does that happen? This is because the scale value for the vertical scale is the same in both the examples, but the scale value for the horizontal scale is compressed in Example 8.

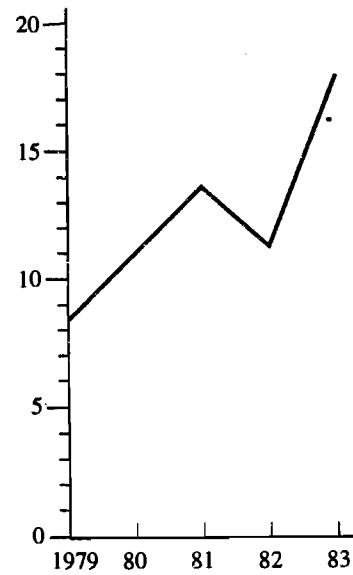
Example 7

Profit in Lacs of Rupees



Example 8

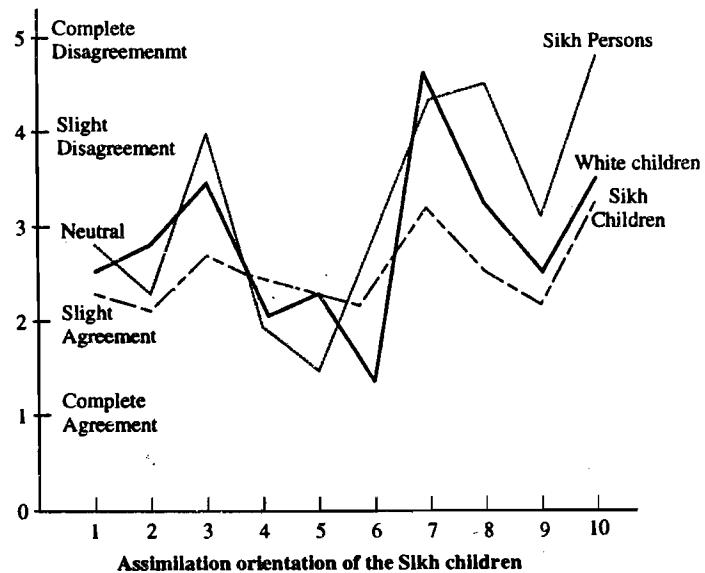
Profit in Lacs of Rupees



(Adapted from : *Business Writing: Process and Forms* by Richard P. Batteger. Wordsworth Publishing Company)

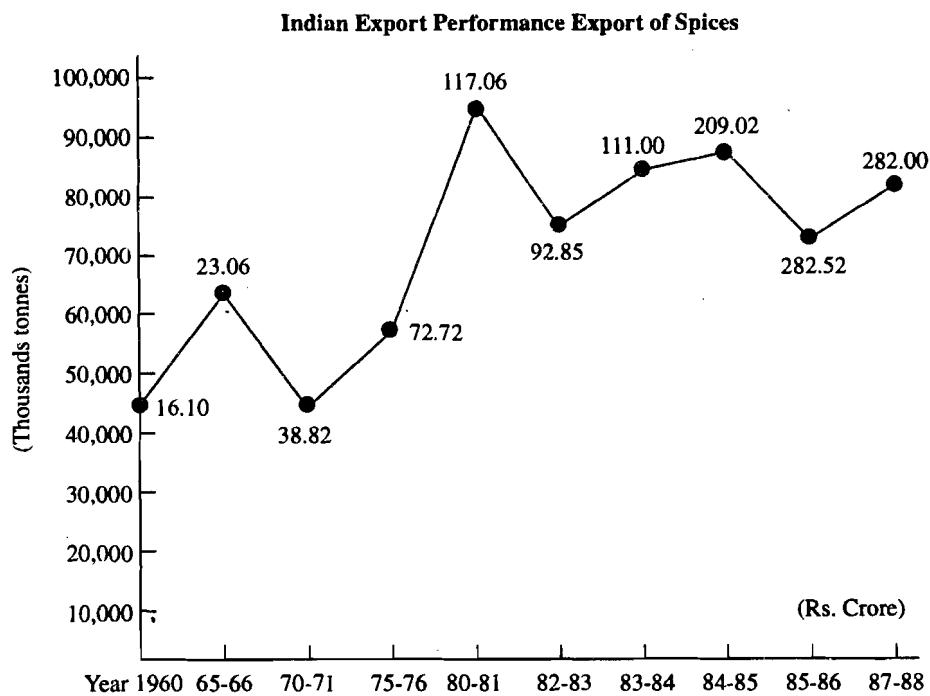
Check Your Progress 2

1. Look at the figures given below. Looking at its appearance, what do you think is wrong with the graph? How would you improve it?



(*Crisis of Identity*, R.K. Agnihotri, Fig.2)

2. Look at the following line graph carefully. Then read the statements based on the graph. Indicate whether those statements are true (T) or false (F).



(From: *Business India*, May 1-14, 1989)

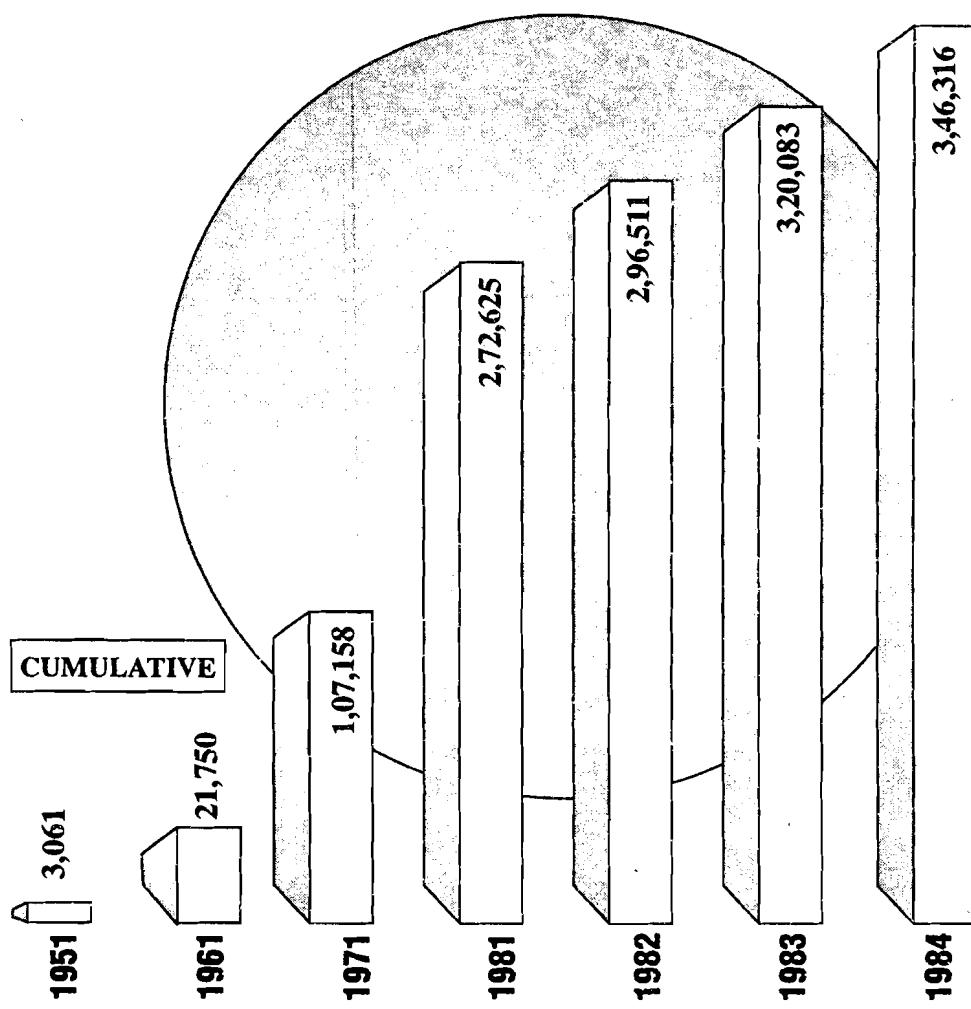
- i) Nearly the same amount of spices (in tonnes) was exported in the years '82-83' and '85-86'.
- ii) India's performance regarding the amount of spices (in tonnes) exported peaked in the mid-seventies.
- iii) Spices worth more than Rs.100 crores were exported in the year '83-84'.
- iv) The beginning of the seventies saw the export of about 40,000 tonnes of spices.
- v) Less than Rs.60 crore worth of spices were exported in the year '75-76'.
- vi) The lowest amount of spices (in tonnes) was exported in '70-71'.
- vii) The amount earned through the export of spices showed a decline during the year '82-83'.

10.5.2 Bar Charts

Bar Charts consist of a series of horizontal or vertical bars drawn parallel to each other along a scale of measurement. Each bar can represent a different item or the same item at different times, and the scale can be either a scale of percentage or one of absolute quantities. Therefore, bar graphs are useful for showing comparisons between the figures for the same item for different periods of time (Example 9 below) or for different items for the same period of time (Example 10).

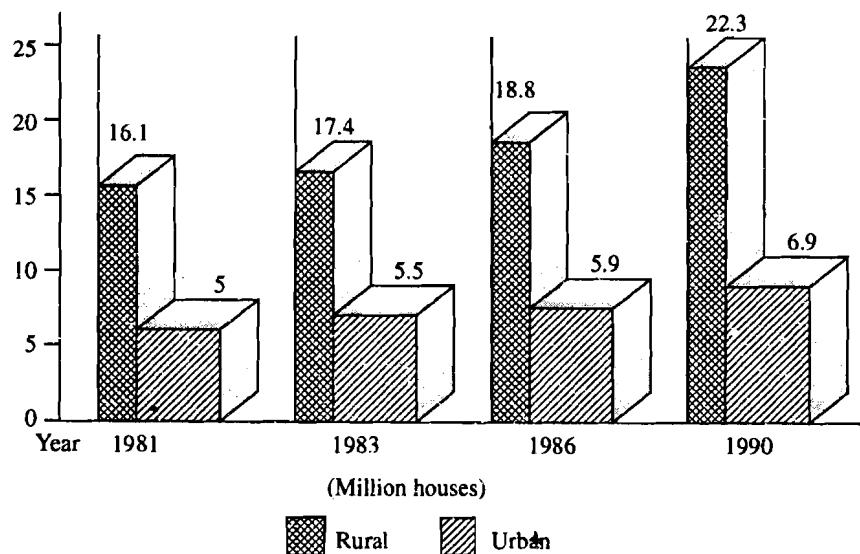
Example 9

ELECTRIFICATION OF VILLAGES



Example 10

Housing Shortages



(From *Business India*)

It is helpful for your readers if you label the tops of the bars in your chart. Since it is the top of the bar that interests readers that is naturally the first place they look at.

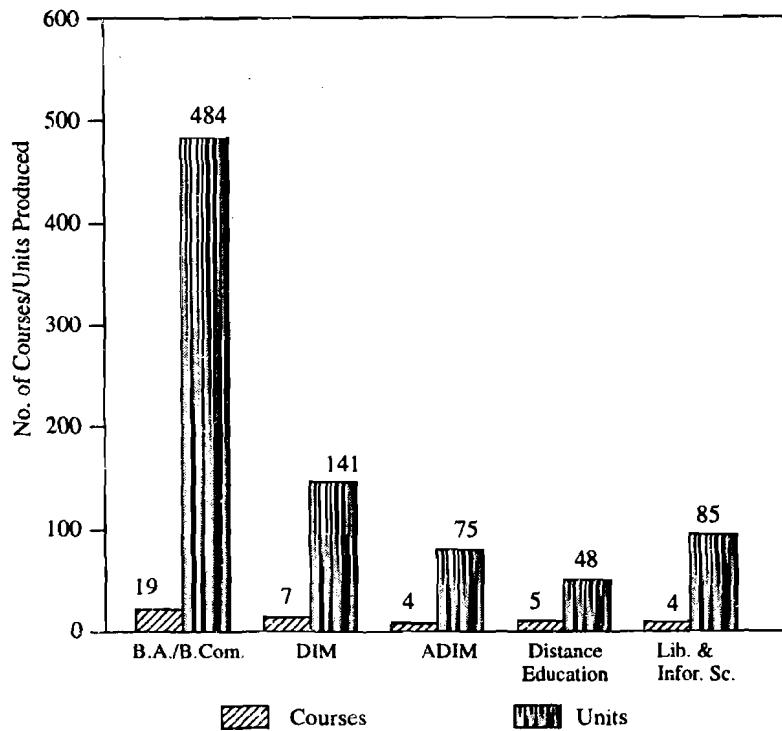
Check Your Progress 3

Convert the information contained in the following table into two bar charts. One of the charts should relate to the 'Number of Courses' and the 'Number of Units Prepared' while the other chart should relate to the 'Number of Audio Programmes Completed', and the 'Number of Video Programmes Completed'. We have done the first one for you as an example.

**Academic Programmes
Course Material Output**

S.NO	Programme	No. of Courses	No. of Units	No. of Audio	No. of Video
1.	BA/B.Com	19	484	124	45
2.	DIM	7	141	21	41
3.	ADIM	4	75	13	12
4.	Distance Education	5	48	13	10
5.	Lib. & Inf. Science	4	85	6	5
	TOTAL	39	833	177	113

(From : *Status Report.*)



10.5.3 Flow Charts

Not all charts represent quantitative information. For example, you may wish to illustrate the stages of a process, point out locations, give directions, or show relationships. You can do this by using flow charts, diagrams, and maps.

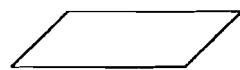
A flow-chart (or flow diagram) is a drawing in which particular shapes and connecting lines are used to show how each particular action in a system is connected with the others.

Flowcharts are an excellent way of illustrating the stages or the steps of a process, or the path-ways along which information or the manufacture of components is to travel during specific operations. Flow charts can show a series of steps that occur in a sequence, or they can show a number of steps or processes that occur simultaneously. They are drawn using a set of conventional symbols that represent various operations. The symbols are connected by arrows to indicate the order in which the activities will occur. We give below a small selection of symbols which will be sufficient to demonstrate their use in flowcharts.

A terminal symbol. It is a symbol used to denote the beginning and end of a flowchart. Within the symbol you write START, STOP, END.



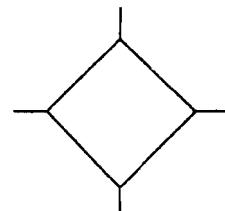
An input symbol. It is used to denote the input that is used to trigger off a decision or a process.



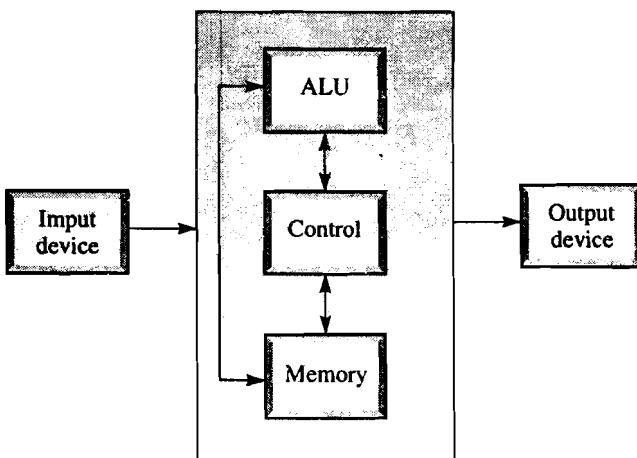
A process symbol. It is used to define the execution of an operation or event. The meaning of the operation or event can be given within the symbol



A decision symbol. It is used to ask a specific question, the answer to which should be yes or no

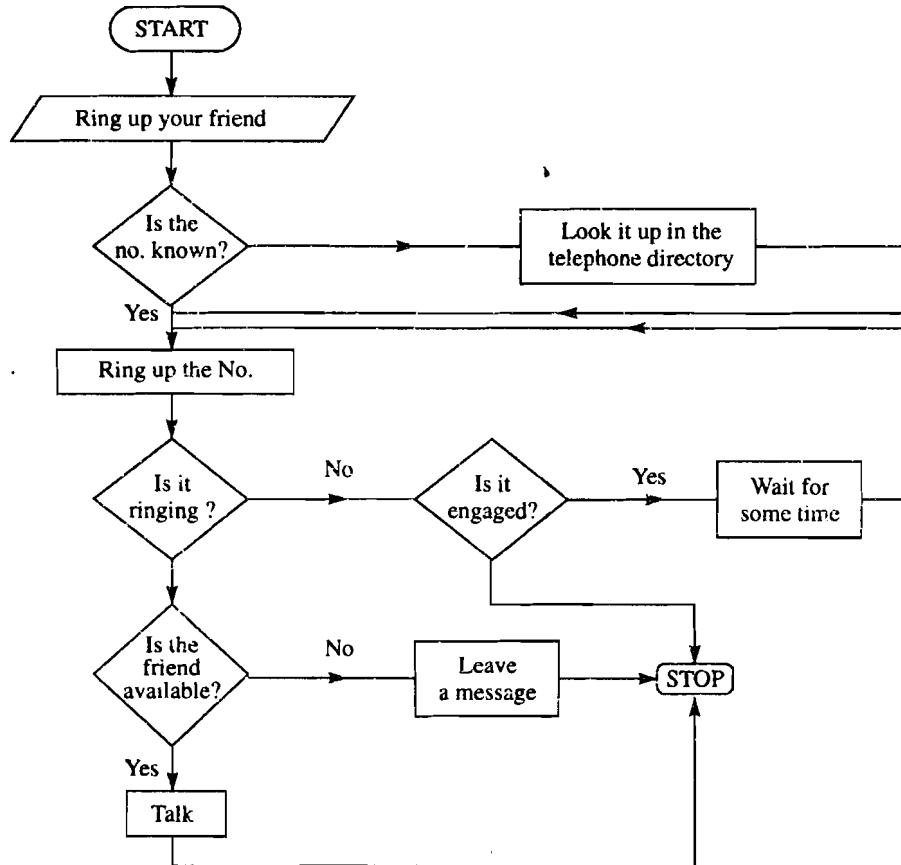


Using flow charts is particularly useful if you wish to simplify your descriptions and provide an easy-to-use visual reference for your readers. For example, a well-designed flow chart will help you guide your readers through complex descriptions because they present the entire process at once, and thus serve as a guideline to indicate where you are going and how you are getting there. Another important use of flow charts is that they prevent readers from visualising complex processes on their own, and thus making mistakes.



The figure above shows these five parts in an arrangement which closely resembles the basic anatomy of today's computer. The three parts consisting of the Store, Mill and Control units are collectively known, in current terminology, as the Central Processing Unit (CPU). It is this to which we really refer when talking about the computer. The other two units, the Input and Output devices (I/O), are concerned with entering information (instructions and data) into the CPU, and with outputting the results once processing has taken place.

In order to understand the basis of flowcharts, it is better to begin with simple real-life problems. For instance, you want to ring up a friend and give him/her a message. How would you go about doing so?



Check Your Progress 4

Now try this very simple exercise. A man, who is a bachelor, leaves for work every morning. If he leaves by 8.30 a.m. he first has breakfast at Anupam Sweets and then catches a bus to office. If he leaves home later than that, then he skips breakfast and proceeds straight to office. Draw a flowchart describing his movements.

10.6 LET US SUM UP

In this unit, we made you aware of the communication of information by means of tables, charts and graphs, so that you can interpret them in the texts you read and use them in your own writings.

10.7 KEY WORDS

Condensing: to make something shorter

caption: the words underneath a table or a chart, which explains what the table/chart is about.

distort: Changing a piece of information in such a way that its meaning becomes different

10.8 MODEL ANSWERS

Check Your Progress 1

1.
 - a) Mazda and Honda
 - b) Lada and Ford
 - c) Honda
2.
 - i) a period of four
 - ii) thirteen
 - iii) reduced
 - iv) production
 - v) 1237
 - vi) 1720
 - vii) Gross profit
 - viii) 1984
 - ix) 32 lacs
 - x) 1988
3. Table: Consolidated Electric Employee Length of Service

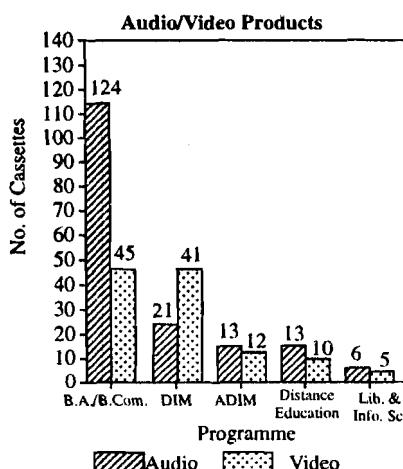
Consolidated Electric Employees' Length of Service

Years of Service	Number of Employees	Percentage of Total
Under 5	1,989	25
5 to 10	1,590	20
10 to 15	1,275	16
15 to 20	784	10
20 to 30	931	12
30 or more	1,294	17
Total as of December 31	7,863	100 per cent

Check Your Progress 2

1. The lines have not been differentiated from one another. The graph would improve if a dotted line, a thick line, and a thin line were used.
2.
 - i) T
 - ii) F
 - iii) T
 - iv) T
 - v) F
 - vi) F
 - vii) T

Check Your Progress 3



Check Your Progress 4

Visual Aids

