UNIT 5 INSTRUCTIONAL MEDIA AND MATERIALS – I

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5.1 INTRODUCTION

All kind of instructional activities are geared towards achievement of pre-determined instructional objectives. Instructional objectives determine the learning experiences required for their attainment. Organisation of learning experiences does require the use of various methods, media and materials. Methods, media and materials help a teacher to transfer the learning experiences to his/her students effectively.

In this unit, as well as in the Unit 6, our main focus is to provide you with a variety of media and materials which are used in the instructional process. We also discuss the need for aiding instruction, classification of teaching-learning aids and guidelines for using visual aids. We focus on verbal printed materials and non-projected two-dimensional visuals in this unit.
5.2 OBJECTIVES

After going through this unit, you will be able to:

- discuss the importance of teaching-learning aids;
- classify instructional media and material on the basis of their characteristics;
- justify that different instructional contexts demand use of different media and material;
- acquire awareness about the effective use of blackboard;
- describe the procedure and skills in making graphic aids for instruction; and
- classify verbal printed material into various categories.

5.3 NEED FOR AIDING INSTRUCTION

In the process of your study of the course on ‘Curriculum and Instruction’ you would have understood that instruction is a formal activity and is purposeful by nature. The purpose of instruction is to help the learner achieve learning objectives. Therefore, instruction as an activity cannot be claimed to have occurred if corresponding learning objectives are not attained by the learner. The ‘effectiveness’ of an instructional programme, thus, can be measured in terms of the extent to which the learning objectives are attained by the learner. For example, this module spells out six objectives to be attained by you. If, at the end of instruction (which is self-instructional here), you have attained only five objectives satisfactorily, then this instruction cannot be claimed to be fully effective.

5.3.1 What Makes Instruction Ineffective?

In the cause-effect relationship of instruction and learning, if learning is attributed to the learner, then instruction (teaching) is attributed to the teacher.

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Teacher → Instruction → Learning → Learner
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Ineffectiveness in instruction is likely to be attributed directly to the ineffectiveness of the teacher. You would agree that, unless analysed further, the above conceptualisation is incomplete. Assuming that the learner has the requisite abilities to learn and that the content is appropriate to the learner, the way in which instruction is organised would decide the extent to which learning takes place. By organised instruction is meant ‘experiences’ which are deemed to be enabling the learner attain learning objectives. Experiences that cause learning are of different kinds and they can be arranged on a continuum of “directness to indirectness” or on a continuum of “concreteness to abstractness”. Such an exercise has been done by Edgar Dale who arranged the experiences on the above continuum and represented them as a ‘cone of experience’ (for more details refer to Unit 17 of the course “Curriculum and Instruction”). Thus, the experience of a flower could be presented to the learner by providing him with a real flower which he could see, smell and touch or through an artificial flower, which also could be handled by him, or through a three-dimensional model, a photograph, a drawing, a sketch, a diagram, or the spoken and the written word ‘flower’. As you know, all these experiences of the same content of ‘flower’ are not similar and hence the nature of learning attained would also not be similar. If spoken and written experiences cater to the attainment of vocabulary and verbal abilities, the visual experiences of a diagram, sketch, or a photograph would also cater to the attainments in written expressions like ability to make a labelled diagram or learning to recognise a flower from those which are not. This would mean that the learning outcomes of instruction, which are stated as the instructional/learning objectives by the teacher, would depend upon the nature of learning experiences.

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Instructional/Learning Objectives → Learning Experiences → Learning Outcomes
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Fig. 5.2: Objective-experience-outcome relationship
From the above discussions, we may be able to state that:

- Learning outcomes depend on the learning experiences and they are many and varied.
- Learning outcomes are pre-determined by the instructor and are stated as instructional objectives.
- Instructional objectives determine the learning experiences required for their attainment.
- Organising instruction means organising learning experiences in accordance with the instructional objectives.

Let us reconsider now the question of ineffective instruction. Ineffectiveness in instruction may now be understood as meaning inappropriateness of learning experiences even when the instructional objectives are stated properly.

### Check Your Progress

**Notes:**

a) Write your answer in the space given below.

b) Compare your answer with the one given at the end of the unit.

1. Do you think teacher ineffectiveness in organising instruction means ineffectiveness in oral communication?

2. Why Teaching-Learning Aids?

There could be several reasons for the use of teaching-learning aids by the teacher. A few important reasons are as follows:

a) **Multiplicty of objectives:** You know that the instructional objectives to be achieved through teaching are many and varied. You also know that Benjamin Bloom has given us a 'Taxonomy of Instructional Objectives'. Achieving these objectives would, as stated before, require organising various learning experiences, and by necessity, this would mean the use of various media and materials. This may be summarised as follows:

   ![Figure 5.3: Linkage between objectives, experiences and media](image)

b) **Teacher incompetence:** In order to organise instruction effectively, a teacher requires to possess a large number of competencies. In situations of oral communication, he needs to possess an audible voice, which could be modulated or even produced rhythmically as in teaching of poetry. In visual communication, he needs competence to write legibly and draw accurately. From the angle of content, one needs a good memory for presenting accurate data and sequentially organised content. Despite his efforts, a teacher may not possess all these to a high degree and hence would run the risk of becoming ineffective. However, he can overcome such risks if he uses teaching aids such as audio cassettes, graphic aids, and transparencies.

c) **Learner motivation:** It is a known fact in educational psychology or for that matter in advertisement, that attention is a prerequisite to learning. Only a motivated learner has the attention needed for learning. Unless there is variety in the situation of learning or the material being learnt, providing continuous attention is a difficult task for the learner. Stimulus variation in teaching has a desirable effect on the learner motivation. Use of teaching aids ensures stimulus variation.

d) ** Appropriateness of learning experiences:** While teaching a group of learners, as seen in a classroom, it is not enough that the teacher has appropriate material. It needs to be ensured that the appropriate material is presented appropriately as well. For example: If a small picture or photograph is appropriate for an individual learner, its use in classroom may require that the picture is enlarged, say with the help of a projector so that its presentation...
becomes appropriate. Use of teaching aids, then, is also with a view to ensuring that learning experiences are presented suitably.

Check Your Progress

Notes: a) Write your answers in the space given below.

b) Compare your answers with the one given at the end of the unit.

2. Describe the importance of using teaching-learning aids to make instruction more effective.

| 5.4 CLASSIFICATION OF TEACHING-LEARNING AIDS |

Teaching-learning aids are classifiable in several ways. Edgar Dale's cone of experience provides us with one such possibility of classifying them. In Unit 7, under "Curriculum and Instruction", you would have studied that teaching-learning aids are classified on the basis of four important characteristics, viz., stimulations provided to the sense organs, learner's control over media, type of experience they provide, and their reach.

The most widely made traditional classification is on the basis of the senses that are stimulated by the teaching-learning aids. These can be classified as follows: Out of these six categories, the first two categories are described in this unit, while the rest are dealt with in next chapter.

I. Visual (Verbal) Print or Duplicated
   - Textbook, Supplementary Book
   - Reference books, Encyclopedia, etc.
   - Magazine, Newspaper, etc.
   - Documents and Clippings
   - Duplicated Written Material
   - Programmed Learning Material and Self-instructional Modules
   - Case Studies (Simulating Reality) and Case Report

II. Visual (Pictorial) Non-projected Two-dimensional
   - Blackboard Writing and Drawing
   - Charts
   - Posters
   - Maps
   - Diagrams
   - Graphs
   - Photographs
   - Cartoons
   - Comic Strips

III. Audio
   - Human voice
   - Gramophone records
   - Audio tapes/discs
   - Stereo records
   - Radio broadcast
   - Telephonic conversation
IV. Visual Non-projected Three-dimensional
- Model
- Mock-up
- Diorama
- Globe
- Relief Map
- Specimen
- Puppet
- Hologram

V. Visual Projected (Still)
- Slide
- Filmstrip
- Transparency (OHP)
- Microfilm, Microcard
- Computer

VI. Audio-visual Projected (With Motion)
- Motion Picture Film
- Television
- Close-circuit Television
- Video Cassette/Disc
- Multimedia Computer
- Slide-Tape Presentation

Check Your Progress

Notes: a) Write your answers in the space given below.
   b) Compare your answers with the one given at the end of the book.

3. With respect to the categories I and II above, identify three learning aids in each, which are most used in classroom instruction.
   I. Visual (Verbal)
   1. 
   2. 
   3. 
   II. Visual (Projected)

5.5 VERBAL (PRINTED) MATERIAL

In the classification of teaching-learning aids provided earlier, category II consists of those visual aids which contain printed verbal material. You would agree that each of the listed materials under this category has distinctly different purposes, content and organisation of material. Also, they are not used equally extensively in the instructional process.

5.5.1 Textbook and Supplementary Book

Both these verbal materials are specially written by authors for the students of a particular grade or course. They are prescribed by the institution and based on a specified syllabus under a curriculum. Hence, they may be considered as curricular material. The text and supplementary book are used both by the teacher and the students during course of instruction. Materials in a textbook are predominantly verbal with some essential pictorial visual support. Normally, a textbook consists of classified segments of matter under chapters, units and lessons. The style in which the text and supplementary books are written would necessitate
teacher mediation and hence are not meant for self-learning by the student. The most heard criticism about a textbook is that it presents “predigested” material wherein the learner has hardly to think but “read to remember”.

5.5.2 Workbook and Copybook

As the names would suggest, workbooks and copybooks are meant for the learner to perform a written exercise or undergo writing practice. Normally, they support textbooks in the sense that they cover those responses of the learner which involve writing. It is not necessary, though, that every textbook should have an accompanying workbook. Normally, a workbook or copybook does not give the learner any new information. Workbooks and copybooks provide learners with graded exercises which proceed from easy to difficult tasks.

5.5.3 Programme Learning Material and Self-instructional Module

Unlike textbooks, programmed learning material (PLM) and other variations of it like the open university course materials are used exclusively by the learners and they are designed to be so. If a text or supplementary book presents matter in one chunk, the PLM and other ‘self-instructional material’ provide the content in meaningful and convenient ‘bits and steps’

Also, unlike the textbook, the SIM ensures ‘learner participation’ and involvement by presenting answers to them. This ensures that the learner ‘evaluates’ his progress. The answers provided to the questions help him do so and they act as ‘reinforcement’ in learning. However, the SIMs have one thing in common with textbooks and that is ‘self-pacing’ or the possibility for the learner to proceed with learning at a speed convenient to him. Such a thing, for example, is not possible at the speed with which the material in a lecture is delivered.

5.5.4 Encyclopaedia and Reference Book

Classroom learning often raises many questions and problems which require further investigation. Encyclopedias and reference books are a good source which provide basic factual information. They provide the learner with a scope to locate, organise and evaluate material. Encyclopaedia are usually available in sets in which information is alphabetically arranged for easy reference. Properly used, encyclopedias and reference books help students to enrich their own factual background, to improve their skills in finding and interpreting information, and to develop new interests in the world around them.

5.5.5 Newspapers and Magazines

Newspapers are usually for a mixed age group of readers and carry items of new and current affairs. They contain sections for school age children on varied subjects. Magazines are published for the public at large and also for school age children. A few important applications of newspapers and magazines in teaching-learning are: current events study and analysis; study of local, national and world problems, practice in the reading, study of written expressions and styles; and visual and pictorial support to classroom work.

5.5.6 Case Studies and Case Report (Simulating Reality)

Simulation and case reports are specially designed materials that centre around a problem or issue. They present the learner with the background and necessary data on one or more problem or issue which may be of general interest or may pertain to a particular subject of study. If some of them require ‘assuming a role’, most of them involve the learner effectively. Decision-making and problem-solving are other important features of case studies and case reports.

Case studies are normally used in business/management programme and case reports are normally used for discussion in medical/legal education programmes. The learner is either made to analyse the decision of some one else or is himself required to make decisions and solve problems. The most common drawback of simulation and case reports is that they do not provide factual information or ‘hard content’.
Check Your Progress

Notes:

a) Write your answers in the space given below.

b) Compare your answers with the one given at the end of the unit.

4. Fill in the blanks.

a) Material which ensures learner participation and which provides for self-pacing is ________.

b) Printed material that presents matter in chapters, units and lessons for the learner to read and remember is ________.

c) Materials that are designed to support a textbook are ________ and ________.

d) ________ and ________ help a learner enrich his factual background.

e) For study of written expression and styles, one may use ________ and ________.

f) Materials which are problem or issue-centred and which involve the learner are ________ and ________.

5.6 CHALKBOARD AND ITS EFFECTIVE UTILISATION

If printed materials discussed in the previous section are readily available to a teacher, the chalkboard provides the teacher with an opportunity to create verbal and visual messages in the class. If properly developed, the words, graphics and visuals on a chalkboard can contribute immensely to classroom learning. As a teaching-learning aid, the chalkboard has always occupied the pride of place and along with the textbook, is the most used aid.

5.6.1 Types of Chalkboards

To begin with, chalkboards used to be black in colour and hence the name blackboard. This was so because the black surface would provide the perfect contrast to the white chalk. However, due to functional reasons one now finds the chalkboards to be made up of green ground glass painted from behind and called the 'green board'. The glass green board, unlike the blackboard, which is wooden, is also found in shades of green, yellow and grey. A third type of board is the white board which is made of mica or hard plastic. Since the board is white in colour, you would know that the white chalk cannot be used for effective presentation. With such boards one uses ink and marker pens. Writings by these pens can be wiped out and are user friendly as they do not create chalk dust to which some people are allergic.

Apart from the material of which they are made or their colour, chalkboards can also be classified on the basis of their arrangement and mounting in a classroom. Normally, chalkboards are either painted or mounted on the wall. But they are also mounted on a stand with three/two legs or hung on the wall or can be rolled-up. The roll-up board has two rods on both ends and is made of flexible plastic, or rexin. The stand mounting and the roll-up boards are portable.

Chalkboards may have other fittings also. The wall mounted board may have a wooden frame, concealed tube lights on top and fittings to place chalks and duster at the bottom. Chalks are also available in different colours such as blue, yellow and red even though the white chalk is most extensively used, as it contrasts well with black, green and grey background. Needless to say, all colours are not equally visible for students on all chalkboards and hence one should know the colour that contrasts most and otherwise. So, while using more than one colour, maximum writing is done with the most contrasting colour.

5.6.2 Chalkboard Writing

Skill in chalkboard writing is not difficult to acquire though it needs hard work and a lot of practice. Just as handwritings are different for different persons, chalkboard writing also differs from person to person. As a teaching-learning medium, chalkboard writing there are certain guidelines to be followed for increased effectiveness in chalkboard writing:
1. The matter written must be important, since a chalkboard is not a scribble pad.

2. The matter must be sequentially and logically arranged.

3. Utilise the space available so that the chalkboard writing is organised and balanced.

4. Maintain appropriate size to enable all learners to read without difficulty. Authors suggest a size of 3 cm letters for a 6 m deep room.

5. Write from top downwards.

6. If the board is too long, divide the space into two by drawing a dividing line in the middle, if necessary.

7. If, in the beginning, the writings are not parallel to the base use guidelines for practice.

8. Avoid running hand, write bold, independent letters.

9. Underline important words and sentences, use different colour, if necessary.

10. Let the chalkboard writing be in points. Avoid writing notes on a chalkboard.

11. Try to preserve the writing for a review at the end of the lesson.

12. Half a stick of chalk is better to write with than a whole stick. Hold it between the thumb and forefinger so that an inch or less projects.

13. The most convenient place to stand is towards the left side of the board. This allows convenient turning to face the class or board.

14. Use a duster to erase the writing and not your hand.

15. For the sake of practice, try drawing parallel lines from one end to the other vertically, horizontally and diagonally without lifting the chalk.

**5.6.3 Chalkboard Drawing**

You know that the visual material on a chalkboard is not restricted only to writing. A chalkboard is used for drawing diagrams, stick/line figures, action scenes and pictures. Of all this, you would agree that diagrams are the most frequent drawings on a chalkboard. A diagram is a visual made of straight and curved lines or geometrical figures, unlike a picture, a diagram merely represents something or idea. You may remember the following, while drawing diagrams.

1. Straight and curved lines are the most common components of diagram. So, practice drawing lines of different types at different heights on the chalkboard.

2. It is easier to draw short lines and curves on a chalkboard. Practice drawing lengthy lines and curves.
3. Diagrams are accurate and proportionate visual representations. In doing so, lines of different thickness may have to be drawn. Sharpen and shape chalk with the help of blade, knife or sand paper to get desired effect. Holding the chalk at different angles to the board also gives lines of different thickness.

4. Several types of chalkboard drawing devices are available in the market. They make drawing diagrams easy and accurate. Usually, they are oversized geometrical drawing tools made of wood or plastic.

5. Templates and stencils are other aids for chalkboard drawing. One could make them using hardboard or wood.

6. Even thread can be a useful device in drawing lines, circles and curves on a chalkboard.

7. For enlarging a small diagram on a chalkboard, methods such as use of grid/squares and projection are useful.

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**Wrong Handwriting On Chalk Board**

**Constitution of India**

**Beautiful But Cursive And Hence Legible**

**Correct Way Of Writing**

**Constitution Of India**

**Principles/Practices**

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**Fig. 5.5:** Chalk may be sharpened like a drawing pencil, shaped with a knife or with a sand paper pad.

**Fig. 5.6:** Cursive script and correct way of writing.

**Organisation (Layout) of the content:** The presentation of display material on the board is an art. Space available on the board should be used judiciously.
For reference materials. For writing or displaying material developed during the course of the lesson, pertaining to the subject matter.

For display of charts, maps, and for rough work, calculations required for mathematical problems, etc.

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**Fig. 5.7: Judicious use of chalkboard by a teacher**

The proper use of a chalkboard can be done by dividing it in 3 parts with the middle one the widest one. On one corner of the board (the left portion), references or main points are presented and the other (right) portion, is used for displaying visual materials such as maps, graphs, etc. The middle position is for the material to be developed during the lesson. This portion presents the material meant for constantly erasing and writing.

**Display of graphics:** The grid, the projection, the template and such other methods are used for displaying graphics on the board. Let us now discuss some of these.

i) **The Grid Method:** This is the simplest method of drawing an enlarged version of a display. In this, the visual material is covered with a grid. This grid can be made/drawn either on the visual material or on a transparent sheet. You can decide how many times (bigger/larger version) of the visual you want to draw. After this, make the enlarged version of the grid on the board. Thus, new grid will probably enable you to produce a reasonably good copy of the original material, even if you are not good in drawing.

![Fig. 5.8: The Grid method of producing Enlarged Copies of Graphic Material](image)

ii) **The Projection Method:** This technique also helps in producing enlarged version of the visual materials when projected with the help of an appropriate type of projector like slide projector for photographic slides, overhead projector for transparencies, etc. The image of the visual can be projected on the board and then the visual can be traced on the board by using a chalk.

iii) **The Template Method:** This technique is used to draw outline figures on chalkboard. This technique helps in producing visuals of the standard sizes (e.g., maps, scientific apparatus, etc.) on the board with some accuracy. Here you can prepare a suitable template of the required shape in a suitable material, e.g., lightweight material like cardboard, thin metal, rigid plastic, etc. This template can be placed on the board and traced.

In classes where Science, Mathematics, Geography and such other subjects are being taught, it is desirable to have thin lines or matrix drawn permanently in a light colour on the chalkboard or on a part of the board.
Educational Technology: State of the Art

Fig. 5.9: Using an overhead projector and desk lamp to produce an enlarged projection of an image on an opaque medium.

Check Your Progress

Notes: a) Write your answers in the space given below.
      b) Compare your answers with the one given at the end of the unit.

5. Fill in the blanks.
   a) The green board is made of ________
   b) In terms of their arrangement (mounting), chalkboards are classified as ________ and ________.
   c) Why are guidelines used in chalkboard writing?
   d) Other than writing, for what purposes is a chalkboard used?
   e) Using chalk, how can lines of different thickness be drawn on a board?
   f) What aids are used in chalkboard drawing?

5.7 NON-PROJECTED TWO-DIMENSIONAL VISUALS

Next to the creations on the chalkboard, the non-projected two-dimensional visuals, which are also called graphics, are the most used as teaching-learning aids. Even though graphics materials are created by a teacher to simplify, illustrate and concretise learning experiences which may otherwise be abstract, the most productive use of graphics in an active learning situation is the student creation of the graphic material.

5.7.1 Varieties of Non-projected Two Dimensional Visuals

While classifying teaching-learning aids, flat picture, cut-out, poster, chart, graph, map, cartoon and comic have been listed under the category of non-projected two-dimensional visuals. You are aware that among these, chart, poster, diagram, graph and map are most used in teaching-learning. Let us try to understand what do they mean.

Diagram: A diagram is a drawing that shows arrangements and relations, as of parts to the whole. It is ‘a visual symbol made up of lines, curves and geometrical forms’. Basically, a diagram explains rather than represents. It contains both pictorial and verbal part and the verbal part is often the title and the labelling of parts.
Chart: In its content and form, a chart overlaps heavily with a diagram. Hence, a chart is also considered a diagrammatic representation. A chart is a visual symbol for summarising or comparing or contrasting or performing other helpful services in explaining subject matter. Charts can present virtually anything except statistical or geographical data. Charts are of different types:

1. **Time Chart:** A time chart is a representation of material in their chronological sequence of happening with suitable indication of time of occurrence. It helps students compare and contrast happenings or events in relation to time. A time chart could also be presented in a tabular form such as the railway line-table.

2. **Tabular Chart:** It presents information and data in a classified or categorised form arranged in tabular columns. Financial statements, balance sheets, profit and loss figures are best represented as tabular charts.

3. **Tree Chart:** It is a depiction of development, growth and change by beginning with a single source which then spreads out into many branches as in the case of a tree. The genealogical tree is a familiar example.

4. **Stream Chart:** It is a depiction of development, growth and change by beginning with the many tributaries which then converge into a single channel (the stream). So, the stream chart can be said as the opposite of the tree chart. A stream chart might show all the raw material necessary for the manufacture of a finished product, such as an automobile.

5. **Organisational Chart:** It is a representation of the functional relations within an organisation. For doing so, rectangles, lines, arrows and circles are used. The administrative hierarchy in an institution or the legal system in a state can be represented in the form of an organisational chart.

6. **Process Chart:** It is a representation of the stages of steps in a process. It is usually in a cyclical arrangement such as in the case of life cycles, energy cycles and conservation cycles. They may also be the steps in the process of making something.

7. **Sequence Charts:** They normally consist of more than one segment or chart and hence have to do with the representation rather than content. Strip chart and Flip chart are two types of sequence charts. The first is constructed as a single chart with various sequential parts covered with strips of paper. The paper strips are removed sequentially to reveal the content in stages. The flip chart is like a calendar with a sheet each for twelve months. As the month changes, the sheet is flipped over. Actually, flip chart consists of several charts arranged in a sequential order and fastened together at one end with thin spiral, metal or wooden strip.

Graph: A graph is a diagrammatic treatment or representation of numeric or quantitative data. Graphs are of three fundamental forms — line, bar and circle. In a way, graphs provide a teacher with the possibility of concretising number and their relationships and provide the learner with a scope to compare, contrast and analyse figures and trends.
Map: A map is a visual representation of the whole or part of the earth. It is drawn to a scale and maintains the directional relationship of the parts. As a teaching-learning aid, maps are indispensable in teaching fundamental concepts such as size, distance, space, location and direction.

Poster: A poster is a bold and symbolic representation of a single idea. Among the two-
dimensional visuals, posters are the most eye-catching because their function itself is to attract the attention and pass on a single message. Posters have both visual and verbal components and the verbal component is often called the 'caption'. What is basic to a poster is the caption and the visual/pictorial part is for attraction and subsequently to support the message contained in the caption. Posters can be highly creative in their content and presentation when compared with any other graphic.

Check Your Progress

Notes: a) Write your answers in the space given below.
    b) Compare your answers with the one given at the end of the unit.

6. Fill in the blanks.
   a) A diagram is a visual symbol made up of lines, curves and ____________.
   b) As a visual representation, charts help a learner in ____________ and ____________ a subject matter.
   c) List below the different types of charts
      ____________
      ____________
      ____________
   d) What is the relationship between a tree chart and a stream chart?
   e) The two-dimensional visual aid appropriate for teaching 'the life cycle of butterfly' is the ____________.
   f) The verbal component of a poster is called a ____________.

5.8 PREPARING TWO-DIMENSIONAL VISUALS

Since there are several types of two-dimensional visuals, it is needless to say that there are different considerations and guidelines for preparing them. However, since they fall under one category of teaching-learning aids, it is possible to think of some general principles and procedures of preparing them.

5.8.1 Analysis of Content

Any visual would centre around one or the other content. Basically, the visual is to aid learning by concretising the content that otherwise is an idea or information and hence abstract. One has to analyse the content with a view to knowing its component parts and their relationships. It is also necessary to know the exact message to be communicated. This may require reorganising the content or collection of more information and data. Since there are several types of visuals, it may also be necessary that one decides about the particular type which is suitable for the purpose.

However, it needs to be said that quite often, a two-dimensional visual is merely an enlargement of material available elsewhere, like in the textbook, and a teacher needs the same in a larger size for classroom teaching purposes.

5.8.2 Techniques of Enlarging Visual Material

1. Grid Method: In this method a grid, which is a matrix or horizontal and vertical lines which are equidistant, is drawn with a pencil on the original material which is small. Another grid is drawn with a larger scale on the chart paper. Maintaining the proportions and direction the figure is hand drawn on the chart paper while referring to the original. The grid here acts as a guideline for enlargement.

2. Projection Method: The original materials projected on to a blank chart paper fixed on a board/wall using episcope, if it is on a transparency. With the help of the image, which is adjusted for its size, pencil sketch is made which subsequently is made permanent by working on the pencil sketch over a table.
3. Pantograph Method: A pantograph is a mechanical device in which a lead-point traces out the enlargement of a figure moved over by a pin-point tracer; while one point is held stationary. Adjustable pantographs are available which can enlarge the original figure upto five times.

5.8.3 Layout

Any visual should not only be accurate in content but also be appealing to the eye. Unorganised, imbalanced materials do not appeal to the human eye. One needs to think about the organisation of the matter or the visual so that it is balanced and not crowded or imbalanced. Balancing means distribution of components over space such that there is comparability between the two-part, if the visual is cut vertically, horizontally or diagonally. A rough sketch of the layout is advised before finalising.

5.8.4 Lettering

Lettering on a two-dimensional visual is done either by free-hand or by using tools or by
using readymade letters. Readymade letters in different sizes, shapes and colour are available in the market which could be stuck or printed by rubbing over the chart paper. Freehand lettering can be done by either first having the pencil sketch or by writing directly. Use of pencil sketch and guidelines is advised unless one is quite sure about the consistency in size and shape of letters in free-writing. Also, a bold style of writing is advised as against italics or stylised writings unless under special circumstances. Several tools are available for writing, the main among them being stencils and templates. Stencils for different size letters and so also for capital and small type are available in the market. Even while working with stencils, it is better to use pencil first.

![Fig. 5.15: Different forms of letters](image)

There are several types of pens, colour and ink available. There are erasable and non-erasable varieties as well. Poster colours are best among the available colours. Indian ink can be used with pen or cartographic pen set.

5.8.5 Colouring

Use of colour makes a visual appealing and helps a student grasp distinctions. But unimaginative use of colour may spoil the appeal of an otherwise appealing content. Colour has three basic properties — hue, value and intensity. Hue is what we ordinarily mean when we talk of a specific colour such as red, orange or blue. Value is the relative lightness or darkness of a colour. Intensity refers to the relative strength or weakness which ordinarily is referred as brightness or dullness. While selecting a colour one could be more specific if one takes into account the three properties.

While using more than one colour, it is necessary to take into account the colour harmony. On the colour wheel, colours are arranged in a definite order. With the help of the wheel, it is possible to identify colours which are adjacent or opposite to one another.

**Analogous harmony:** Analogous colours are those that adjoin on the colour wheel. For example, when green-yellow, green and blue-green are used, it would make an analogous harmony.
Complementary harmony: Colours which lie opposite each other on the colour wheel are called complementary colours. For example, red and blue-green, yellow and purple-blue would make a complementary harmony. Colour scheme generally uses a pair of opposites and one other colour bordering on either side of either colour.

Monochromatic harmony: In this harmony, only one hue is used in varying range of values or of intensities.

While using colour, one needs to remember that: (a) colours change in accordance with their background. A black or white background helps to bring together discordant colours and sets them off, (b) colours change when you add black, white or any other colour to them, (c) colours have inherent property to portray feelings or evoke them. Some can be cool and soothing and others hot and disturbing.

5.8.6 Border

Normally visual materials such as chart, poster or diagram do require a border which brings out the content of the visual. Borders are usually coloured dark and would differ according to the colour scheme of the visual. About 1 to 3 inch border is provided to a standard size chart or poster. However, under special circumstances, one may avoid the border.

5.9 GUIDELINES FOR USING VISUAL AIDS

Some important points to be borne in mind while using a visual aid are:

- Avoid confusion – have the aids in proper order and accessible.
- Greatest interest in the visual aid is evoked at the time of the initial showing. So, keep aids out of sight till their turn comes.
- Use, do not merely show them.
- Display one teaching aid at a time, if many are being used in the same class.
- Supplement visual aid with chalkboard sketches and explanations. Use them as aids as they don't instruct on their own.

5.10 CHARACTERISTICS OF A GOOD VISUAL AID

You will agree that it is appropriate at this point to indicate some of the most desirable characteristics of a good visual aid in order that these criteria may be recalled in designing, preparing and evaluating teaching-learning aids of this category.
1. It should explain an abstract idea, show a relationship, or present a sequence of procedure that cannot be clarified without it.
2. It should be large enough to be clearly visible to the entire group.
3. Avoid unnecessary decoration.
4. Avoid too much writing and the writing should be within the comprehension of the learners.
5. The important parts should be accentuated by use of effects such as bright colour.
6. Whether reduced or enlarged, keep the visual to a scale and maintain proportionately.
7. It should show good workmanship and careful development.
8. It should be mounted in such a way as to make it portable.
9. It should be displayed properly.
10. After use, it must be preserved using appropriate storage technique.

Check Your Progress

Notes: a) Write your answers in the space given below.

b) Compare your answers with the one given at the end of the unit.

7. Fill in the blanks:
   a) The technique of enlarging a visual material are ____________ and ____________.
   b) Lettering on a two-dimensional visual can be done through ____________ or ____________.
   c) Three basic properties of colour are ____________ and ____________.
   d) What is complementary harmony?

5.11 LET US SUM UP

The effectiveness of instruction is influenced greatly by the nature of learning experiences because it is the learning experience which enables a learner achieve the instructional objective. In providing learning experiences, a teacher makes use of the teaching-learning aids. Some important reasons for the use of teaching-learning aids are multiplicity of objectives, teacher incompetence, learner motivation and appropriateness of learning experiences. Teaching-learning aids can be classified as audio, visual (verbal), visual two-dimensional, visual 3-dimensional, projected visual, and audio-visual.

Verbal (print) materials of different kind such as textbook and supplementary book, workbook and copybook, programmed learning material and self-instructional module, encyclopedia and reference book, newspaper and magazine, simulation and case report are used to provide learning experiences of different kinds. Textbook and chalkboard are the two most used teaching-learning aids in teaching. Chalkboards are wall-mounted or stand-mounted or roll-up type. Chalkboards are used for writing as well as drawing, and in doing so, one needs to follow certain guidelines.

Diagram, chart, graph, map and poster are the two-dimensional non-projected visuals used in classroom teaching. Each one of them differs from the other in its content as well as the purpose for which it is used. Also, some of them, such as charts, have further varieties within themselves. Generally, one needs to give attention to the analysis of content, technique of enlargement, layout, lettering, colouring and border. It is on the basis of these above aspects of a two-dimensional non-projected visual that we can list a set of characteristics of a good visual aid. Lastly, it needs to be remembered that the way a good visual aid is used in the classroom must also be good.
5.12 UNIT-END ACTIVITY

1. Imagine that you are to assess the performance of a teacher with respect to the following: Develop, for each one of them, a checklist that you are going to use:
   a) Blackboard work
   b) The quality of a chart prepared.

5.13 ANSWERS TO CHECK YOUR PROGRESS

1. No. Oral communication involves only one kind of learning experience and hence even if a teacher is effective in oral communication he may still be ineffective in organising instruction.

2. Use of teaching-learning aids makes instruction more effective by ensuring that appropriate learning experience are provided for all stated objectives. In doing so, it reduces teacher incompetence, and enhances learner motivation.

3. **II. Visual (non-projected)**
   a) Blackboard
   b) Encyclopedia and Reference book
   c) Simulation and Case Report

4. a) Self-instructional Material
   b) Textbook
   c) Workbook and Copybook
   d) Encyclopedia and Reference Book
   e) Newspaper and Magazine
   f) Simulation and Case Report

5. a) Ground glass
   b) Wall mounted, roll-up board and stand mounted.
   c) To avoid slanting of lines and to maintain the size of letters.
   d) Chalkboard is used for drawing diagrams, stick/lines figures, action scenes and pictures other than writing.
   e) By sharpening the chalk or by holding it in different angles to the board.
   f) Geometrical drawing tools, stencil, template and even thread.

6. a) Geometrical forms
   b) Summarising, comparing and contrasting
   c) Time chart, tabular chart, tree chart, stream chart, organisational chart, process chart and sequence chart.
   d) They are visually opposite of each other.
   e) Process chart.
   f) Caption.

7. a) Grid method, projection method and pantograph method.
   b) Free-hand writing, using tools, and using readymade letter.
   c) Hue, value and intensity.
   d) The colour scheme which uses colour placed opposite each other on the colour wheel and an adjacent colour makes complementary harmony.