
UNIT 7 TEACHING LEARNING MATERIALS

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7.1 INTRODUCTION

All of us have memories of our teachers who had taught us during school or college days. A few of them were good, whereas others were not so good. Let us analyze why did we call them good? Yes, they were caring, sympathetic, and pleasant besides being effective in their teaching. One thing common among them was that they used new methods, techniques and teaching learning materials to make teaching interesting, thus, effective. Teaching learning materials (TLMs), also known as instructional aids, facilitate a teacher in achieving the learning objectives formulated by her/him prior to teaching-learning activities start.

In the present Unit, we will introduce you to various teaching learning materials, which are used to make classroom teaching and learning interesting and effective. In this chapter we shall discuss variety of teaching learning materials used in classroom teaching. We will also explain how to prepare low or no cost TLMs from locally available resources. Involving students in this venture will be experiential learning for them, how to do it? The unit will also guide you on this aspect.

7.2 OBJECTIVES

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

- explain the importance of TLM in enhancing students' learning;
- classify the TLM on basis of their characteristics;
- distinguish the use of different TLM in different contexts;
- prepare low cost TLM using locally available materials;
- involve students in designing and development of TLM;
- explore the web for finding teaching learning materials.

7.3 MEANING AND PURPOSE OF TLMs

Look at these two pictures, what do you observe?

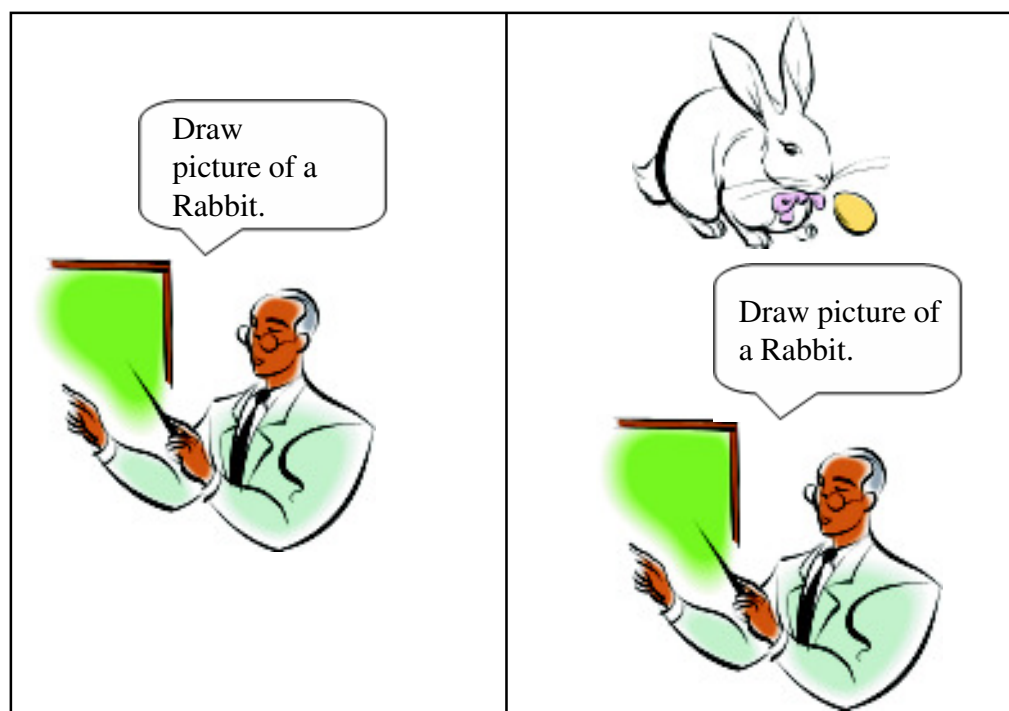


Fig 7.1

Fig 7.2

You are right that the learner will be more enthusiastic and willing to learn in second figure. Why? Because the picture of rabbit in the second figure will help the child to learn, how rabbit looks and draw its picture. The picture of rabbit is a type of teaching learning material (TLM) about which you will study in this section.

Teaching learning materials (TLMs) are, therefore, tools, which are used by teachers to help learners to learn concept with ease and efficiency. TLMs have been in existence in our educational system since ancient times, (Lal, 2011). The role of TLMs in the classroom are to make learning real, practical and fun for children. Teachers use TLMs to illustrate or reinforce a skill, fact or idea. TLMs also help in bringing novelty and freshness in classroom teaching as it relieves learners from anxiety, fear and boredom.

Teaching learning materials provide a range of learning experiences to learners from direct to indirect. Edgar Dale (1969) arranged the learning experiences on

a continuum of 'directness to indirectness' which has correlation with continuum of 'concreteness to abstract'. He called it a 'Cone of Experiences'.

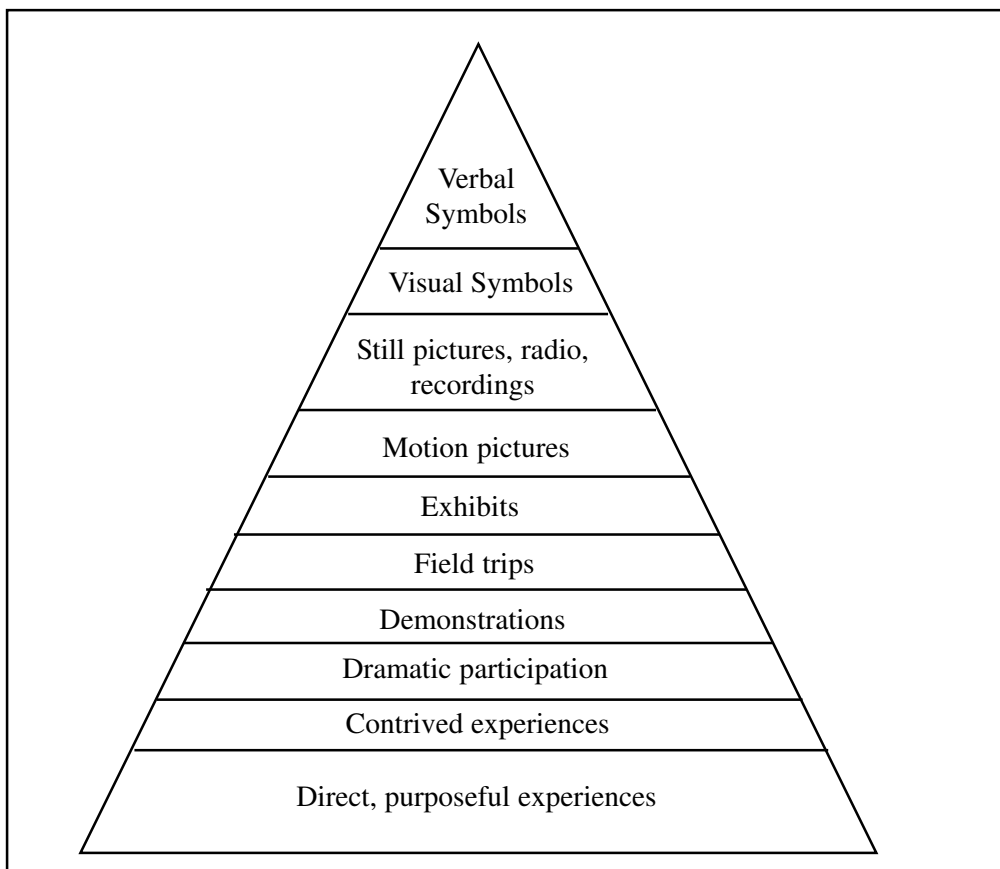


Fig 7.3: Dale's Cone of Experiences

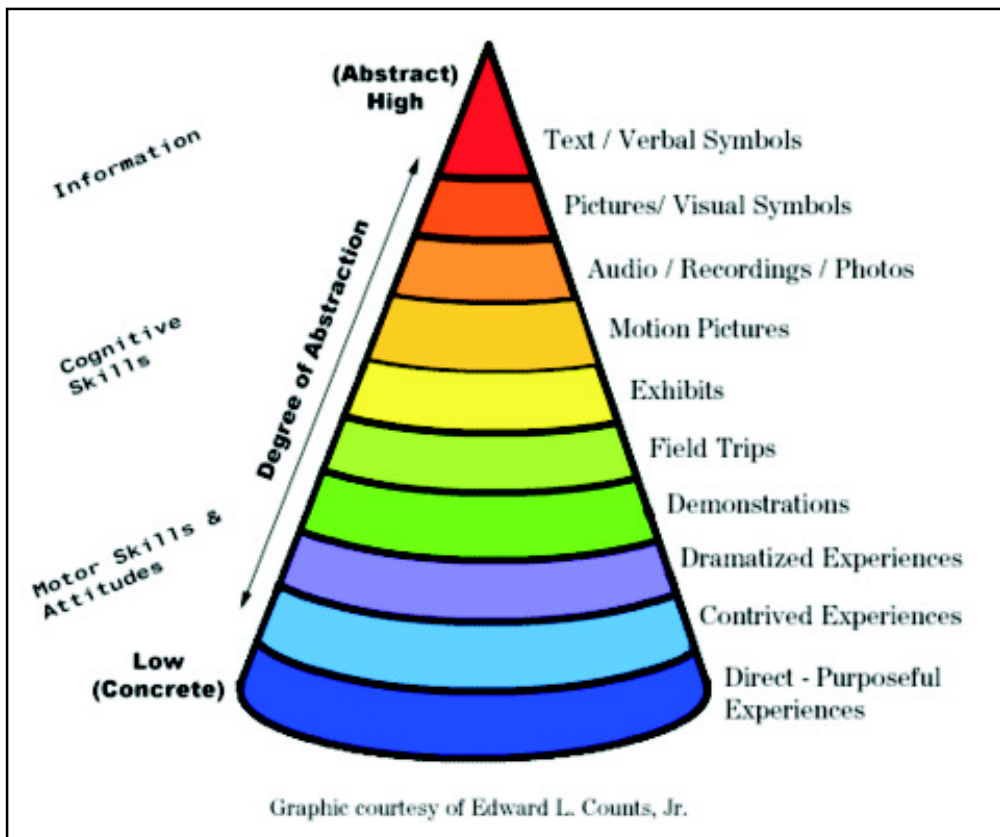


Fig 7.4: Dale's Cone of Experiences showing Degree of Abstraction

Source: <http://www2.education.ualberta.ca/staff/olenka.Bilash/best%20of%20bilash/Images/dalescone2.gif>

The organizing principle of cone is progression from most concrete (direct) experience at the bottom of the cone to most abstract (indirect) at the top. According to Dale, the least effective method is at top i.e. more use of verbal/textual symbols like reading or listening to spoken words. The most effective method is at bottom involving direct, purposeful, concrete learning experiences, such as hand on or field experience. As action learning results in upto 90% retention, teachers should strive for making classroom teaching nearest to direct-experiences.

As field or hands on experiences are not possible in all the cases, a teacher should try and making the classroom instruction most direct using appropriate TLM. The kind of TLM used affects the learning. For example, same content can be taught using different TLM and the retention will vary according to TLM used. If you want to teach parts of a plant, you can provide a continuum of direct to indirect experience to learners. You can provide real experience of plant, which a student can see, smell, touch, and handle in class. You may also bring a model or chart of plant to show its parts. You may also explain the parts of plant verbally with the help of diagram on chalkboard. Not all the learning experiences of same content 'parts of plant' are similar and therefore, learning will not be similar as well. You want to guess in which case learning will be more effective and permanent. Yes, you are right the learning will be maximum in providing real, direct experiences.

Therefore, learning outcomes are highly dependent on the learning experience given in classroom using teaching learning materials.

7.3.1 Purpose of using TLMs

TLMs are used to enhance the learning of students in classrooms. A teacher uses it to make teaching-learning effective. TLMs also help learners achieve the learning outcomes after classroom teaching and learning. Some of reasons to use TLMs in classroom are of various types as described below:

- i) **Motivate learners** – Capturing attention is the first step to any learning and TLMs help in capturing the attention of learner in classroom. Once motivated to look at TLMs, the children are curious to learn new things. TLMs provide a variety of stimuli, which helps in making classroom teaching most effective.
- ii) **Help in longer retention of information** – The more the number of sensory channels involved in interacting with TLMs, the longer will be the retention of information. Therefore, the learning will be effective and will last long.
- iii) **Facilitate holistic learning** – You have read about Blooms –Taxonomy of Objectives. Learning objectives to be achieved through classroom teaching are in all domains- cognitive, affective and psychomotor. Therefore, to achieve varied objectives, varied learning experiences need to be provided, which can be done through the use of TLMs.
- iv) **Help in organizing classroom teaching** – As a teacher you need to organize learning experiences, making them as realistic as possible. You can use visual or verbal TLMs to present accurate data in sequentially organized manner. This helps teacher to verbal and visual communication in classroom. Thus, you may use TLMs to overcome shortcomings in verbal or visual communication.

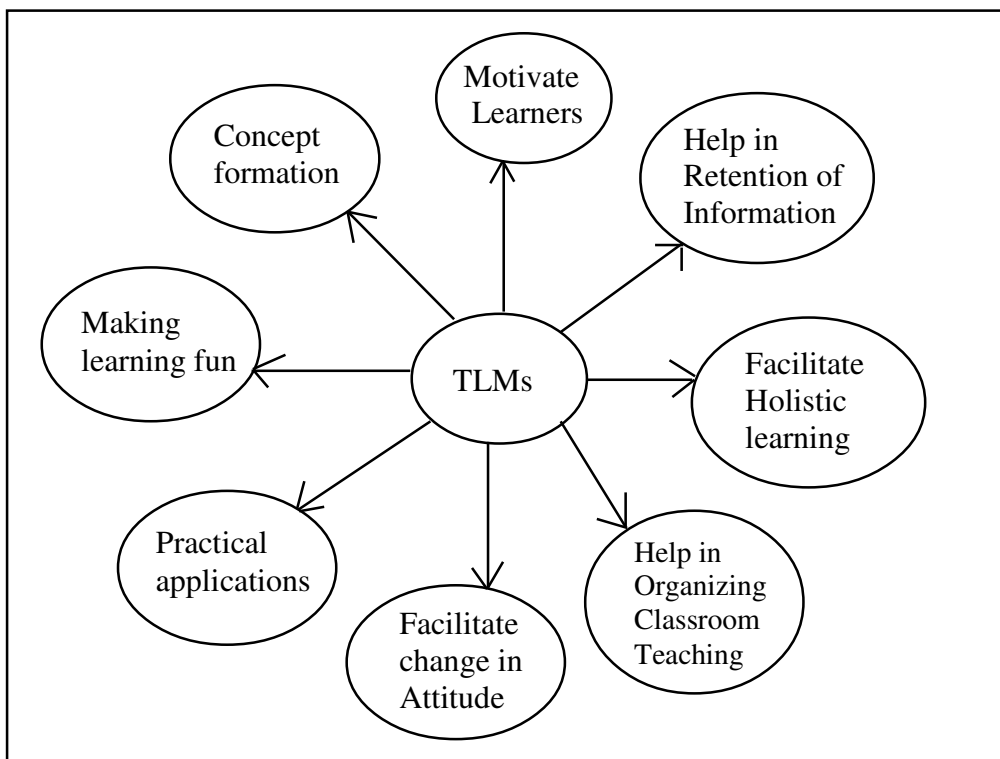


Fig : 7.5: Purposes of using TLMs

- v) **Facilitate change in attitude** – TLMs also help in changing attitude of learners towards learning in general and subject content in particular. Pictures, models and other TLMs help in inculcation of positive attitude of learners.
- vi) **Practical applications** – TLMs show application of theoretical knowledge into practical applications. The theoretical knowledge studied in class is shown in concrete form through TLMs for effective learning.
- vii) **Making learning fun** – TLMs help in making learning fun in the classroom. Students enjoy the novelty of handling new objects and learn new concepts through them.
- viii) **Concept formation** – TLMs facilitate the formation and attainment of concepts among children. They concretize the abstract concepts; thus children are able to understand them and not resort to rote learning.

Therefore, use of TLMs in classroom teaching is an essential aspect about which you should focus your attention while designing and developing your lesson. There are a variety of TLMs to choose from depending on the context, level of learners and availability. The next section will acquaint you with the various types of TLMs available.

Check Your Progress

Notes: a) Write your answers in the space provided after each item.

b) Compare your answers with those given at the end of the Unit.

1) Explain the purpose of using TMLs in teaching-learning process.

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7.4 TYPES OF TEACHING LEARNING MATERIALS

Teaching learning materials are of various types and thus are classified and categorized in several ways. Edgar Dale's cone of experience is one of the simplest ways of categorizing TLMs. He experimented with different TLMs and categorized them on the basis of type of experiences the learner acquires – from concrete to abstract.

Another widely accepted and popular way of categorizing TLMs is based on the senses they stimulate in learners, which, in turn affect the effectiveness of teaching learning process. TLMs can broadly be classified into three categories.

- i) Audio TLMs
- ii) Visual TLMs
- iii) Audio Visual TLMs

Let us look: into these categories in details.

- i) Audio TLMs: These TLMs primarily stimulate the hearing sense of learner. It includes – human voice, telephonic conversation, audio discs/tapes, gramophone records, Radio broadcast.
- ii) Visual TLMs: These types of TLMs involve the sense of vision. They stimulate the visual impulses. These can be of various types as given below:
 - Visual (Verbal) Print. (the text is the main instructional or teaching learning aid)
 - Textbook, Supplementary book.
 - Reference books, encyclopedia, etc.
 - Magazine, Newspaper
 - Documents and Clippings
 - Duplicated written material
 - Programmed material or SLM
 - Case Studies/Reports etc.
 - Visual (Pictorial- Non Projected)–
 - a) Non-projected two dimensional – Here the TLM is in form of an image or picture explaining the concept. Examples of such type of TLMs are blackboard writing and drawing Charts, Posters, Maps, Diagrams, Graphs, Photographs, Cartoons, Comic strips.
 - b) Non-Projected three-dimensional – This category includes three-dimensional representation of the real object or phenomenon. It helps learners in conceptualization. It includes – Models, Mock-up, Diorama, Globe, Relief Map, Specimen, Puppet, and Hologram.
 - Visual (Projected but still) – Here the images are projected or displayed on a screen and thus are nearer reality than visual non-projected ones. It includes – Slide, Filmstrips, Over Head Projector (OHP), Microfilm, Micro card, etc.

iii) Audio Visual TLMs are the projected aids, which use both auditory and visual senses to enhance learning. The greatest advantage of these is they are the closest representation of reality. These include – Motion Picture Film, Television, Video discs/cassettes, slide – tape presentations, Multimedia Computer.

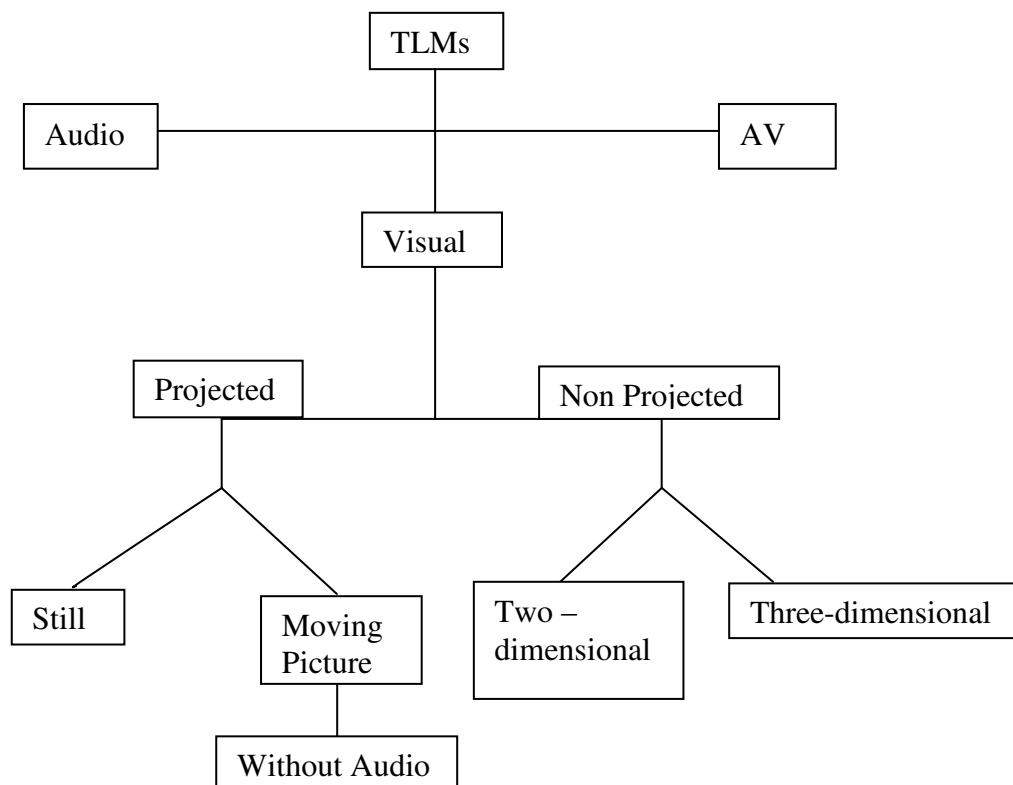


Fig 7. 6: Flow Chart of TLMs

Check Your Progress

Notes: a) Write your answers in the space provided after each item.

b) Compare your answers with those given at the end of the Unit.

2) Fill in the blanks

1) Chart is a type of TLM.

2) Television is a TLM.

3) The full form if OHP is

4) Two examples of non projected three dimensional TLM are,

5) The biggest advantage of Audio-visual TLM is

Let us try to study few of these Teaching Learning Materials in detail, which you can easily use in your classroom teaching at elementary level.

7.4.1 Text Books



Fig 7.7: Picture of a Textbook

Source: <http://commons.wikimedia.org/wiki/File%3ATextbook.JPG>

You must have read many books. In books, text is the method of communicating. Books are written by authors for learners to help them learn new things. The book specially written by authors for learners of a particular course is known as textbook. Textbook is very important basic teaching learning material. It is written specifically to satisfy specific needs of the syllabus. In most cases, a textbook serves as a focal point base for organizing learning activities. In some textbooks like the NCERT textbooks both teacher's and pupil's activities are included in form of questions, suggestions, experiments, topics for discussion, etc. As often they are prescribed by the schools, and are based on specified syllabus under a curriculum, they are often referred to as curricular material.

Textbooks are predominantly textual with some images. Normally, content in a textbook is organized under chapters, units and lessons. Most textbooks are written in factual or information giving style with little or no interactivity inbuilt in the text. Thus, most of them do not serve the purpose of self-learning materials for learners.

When textbooks are written in conversational style with activities, they serve as a basis of self-study as well. They, therefore, assist learners to acquire good reading skills and develop language comprehension. If textbooks are well illustrated and written in interesting style, they act as interesting individualized learning materials for the learners. Thus, the quality and utility of textbook depends on the author.

While writing a text book for students at elementary level, the author needs to keep in mind the following points:

- i) Text book should provide authentic content knowledge;
- ii) Contents in the text book should be logical, coherent and sequential;
- iii) Language used in the textbook needs to be simple, and comprehensible by elementary students;

- iv) Presentation of contents needs to be conversational and based on sound pedagogic principles;
- v) Concepts and propositions need to be explained with examples and illustration;
- vi) There need to be a lot of activities, cases built into the textbook;
- vii) Presentation of contents needs to motivate the learners throughout the process of learning.

Activity :

Analyze the textbook of your class with respect to following points:-

- 1) Is it relevant to prescribed curriculum?
- 2) Is language suitable for the grade?
- 3) How many illustrations are there?
- 4) Do you find any difficulties using it in class?

Graphic Materials

Very often, it is not possible to bring concrete reality to classroom in form of real objects (specimens) or their representations (models). In such situations, you may use graphics. Graphic materials help to simplify, illustrate, and concretize learning experiences for learners. Maps, charts, posters are graphic materials, which are widely used for teaching contents in sciences and social sciences.

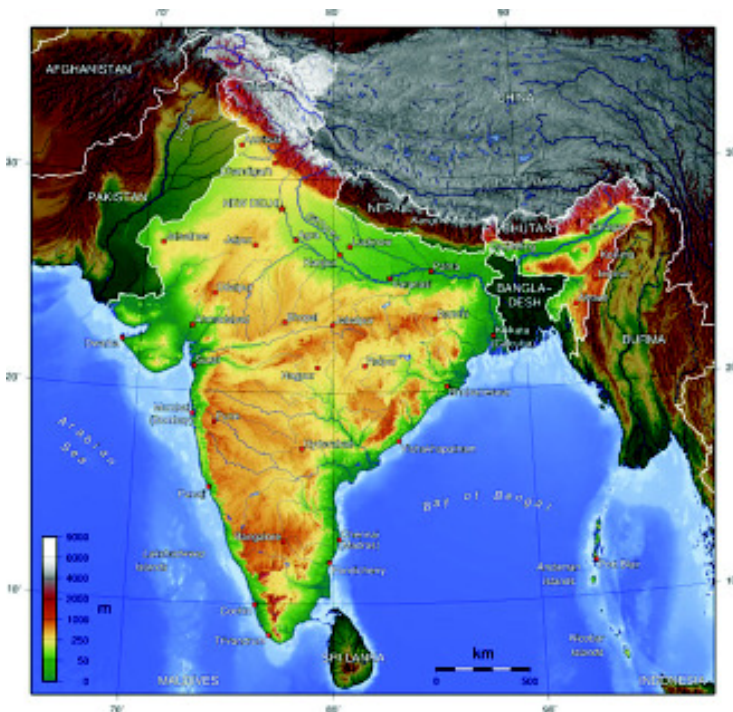
7.4.2 Maps

Fig 7.8: A Topographical Map of India

(Source: http://en.wikipedia.org/wiki/File:India_topo_big.jpg)

You must have used maps to find your way to a new place. Google maps have become almost indispensable finding our way around places. Maps are scaled down representations of the real earth's surface on paper. Every map is symbolized summary of earth's surface; therefore, it provides information in condensed form.

The symbols used are through lines, dots, colours, words and signs.

Maps are useful tool in every discipline. In social studies, it is very important for learning geographical, historical, and economical concepts. Details in map at elementary level are kept simple enabling learners to locate places, different physical features and to read directions.

Maps are broadly classified into following categories:

- **Physical Maps**, which show climate, soil, forest areas, resources, rainfall, etc.;
- **Political Map** which show political divisions of countries and places;
- **Economic Maps** are those maps showing the crop distribution, land use, transport, etc.;
- **Social Maps**, show demographic distribution, in country. The literacy rate, language, tribes etc. are shown on maps for easy comprehension;
- **Historical Maps** show boundaries, of the empires, routes taken by travelers, places of war, treaties, etc.

Map reading skills should be taught to students. Some significant aspects of map reading skills are: symbols of places; location of places – longitude, latitude; different physical features – land form, water form; human factors; climate and resources; distances; transportation.

Activity

Go to Google maps (<https://maps.google.co.in/?hl=en>). Find out the location of your school. Also find out the route from your school to your home.

7.4.3 Charts

A chart is a diagrammatic representation of a system, process, and historical sequence of event. It is visual representation used to summarize, illustrate, compare or contrast, communicate the subject matter in effective and concise way. Charts are used in all subjects for concept formation and development among learners. For example, in order to teach solar system the science teacher can make use of a chart depicting solar system comprising sun and other planets.



Fig 7.9: Solar System

Source : http://centros1.pntic.mec.es/cp.alcarria/solar_system.jpg

If you look around, you will find wide variety of charts being used. The different types of charts are-

- 1) **Process charts**, which are used to show steps in a process. Life cycles of insects, energy cycles, etc are shown as cyclical processes. Stepwise making of a slide box or any other object may also be shown with the help of process chart.
- 2) **Organizational chart** – are used to represent functional relation among the different components in our organization whether manmade or natural. Food chain, administrative hierarchy in institution, etc. can be shown on organizational chart.
- 3) **Time chart** – are used to represent events, occurrences in chronological sequences. Evolution of man, political empires, etc can be shown using time chart, which helps learners to compare and contrast events in relation to time. It is very important for wholistic comprehension of the topic or subject under study.
- 4) **Tabular chart** represents data in tabular form for easy comparison and understanding. For example, types of crops, plants, etc. are represented in tabular form, which makes comprehension easier.
- 5) **Tree chart** shows growth and development from single source to many branches like in a tree. In a time chart, it is generally a single line representation whereas in a tree chart many branches are there like a tree. For example, family tree is a familiar example.
- 6) **Stream chart** is opposite to tree chart wherein many branches come together to converge into a single stream. For example – many rivers like Yamuna fall in Ganga, which then flows down to fall in the sea.

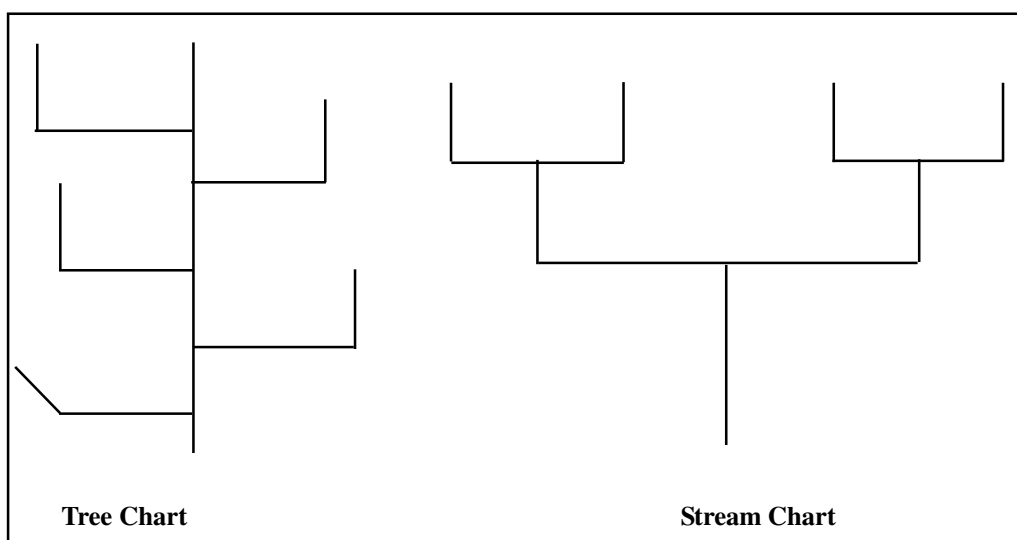


Fig 7.10: Examples of Tree and Stream Charts

Source: IGNOU (2000)

- 7) **Sequence charts or flip charts** are collection of charts like flip charts used to show many events or series of events in succession.

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 this spiral, metal or wooden strip. (IGNOU, 2000)

Check Your Progress

Notes: a) Write your answers in the space provided after each item.
b) Compare your answers with those given at the end of the Unit.

3.A) Distinguish between map and chart.

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B) What are the various types of maps?

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C) Draw an example of process chart.

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7.4.4 Poster

Poster is symbolic representation of a single idea. As a single idea is depicted posters are usually bold, eye-catching to attract learners for giving a message. Posters have both visual and textual components. Visual component is to attract the attention of learner and thus has to be colourful and eye-catching. Text is used to convey message related to visual and is called ‘Caption’. Caption conveys the important message and the visual is to attract attention and therefore to support the message to be converged. Ministry of Health for generating awareness regarding ‘Rural Health’.



Fig 7.11: Poster of National Rural Health Mission

(Source: http://commons.wikimedia.org/wiki/File:Nrhм_logo.jpg#)

Posters show creativity in their designing and development. You must have seen the posters by AMUL, which are very eye-catching. In addition, various Ministries release attractive posters regularly for generation of awareness.

Activity

- A) Find out the various posters published by Sarva Shiksha Abhiyan (SSA).
- B) Give a caption to the following poster.



(Source: <http://www.ssapunjab.org/images/1.jpg>)

7.4.5 Models

Model is recognizable imitation of real thing (eyes) or abstract thing (magnetic). Usually a model is similar to the original object in every aspect except the size. The size of an object may be reduced or enlarged. When size is reduced, the object is simplified to show only the essential parts. For example, globe is model of earth simplified to show earth's essential parts only. On the other hand, when size is enlarged, it shows the details of the object. For example, model of eye is enlarged to allow all the details to be seen easily and clearly.

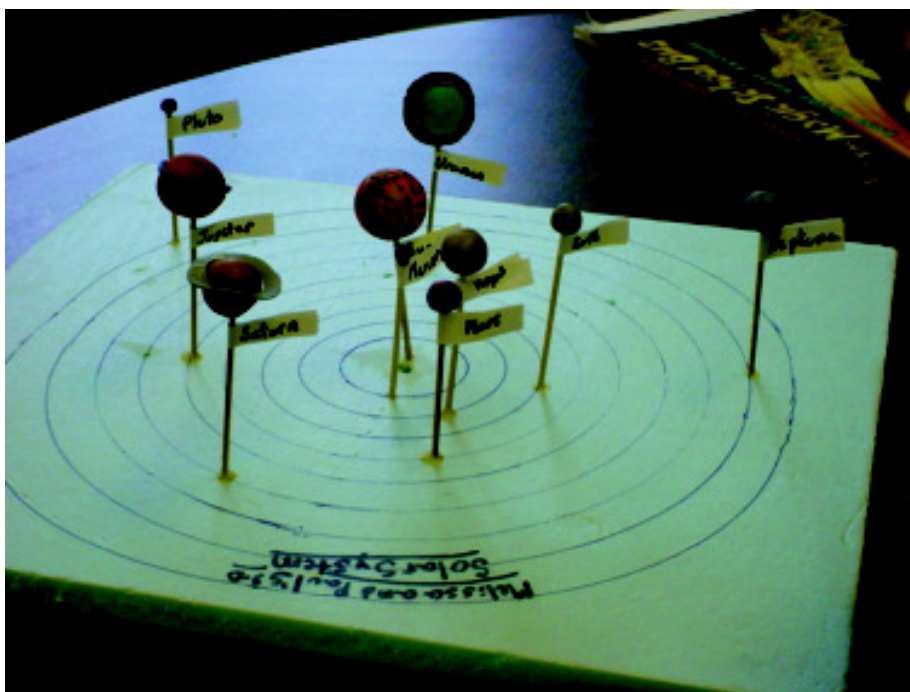


Fig. 7.12: An Example of a Model

<http://www.keystone.fi.edu/photos/nikidonato/001.jpg>

Models are useful as these:

- Simplify difficult concepts;
- Reduce large objects to a conveniently observable size;
- Demonstrate interior structure of an object or system;
- Help learners to understand difficult part of object or system.

It simplifies difficult concepts, processes or complex situations by focusing on essential features only and eliminating complex details, which may hinder in understanding the concept. Models are useful teaching learning material. While using models certain points need to be taken care of-

- Models should be large enough to be seen easily by everyone in the class;
- Models may be supplemented with other TLMs like chart to help learners to understand the relationships;
- If it is working model – check before you use in your class;
- Learners should be allowed to touch the model and feel it for effective learning;
- True colour should be used in models for realistic learning. It also makes the model more eye-catching.

Model can be of two types as described below:

- 1) Stationary or Non-working Model- Stationary or non-working model is the type of model in which all the parts of model are stationary i.e there is no movement. It is easier to make and is widely used as TLM, for eg. Model of eye is a non-working model.
- 2) Working Model- Working Model is a model in which either all or some parts are moving to show the process in the system. They appear interesting to learners. Solar system where all planets revolve around sun is an example of working model.

Preparation of models

The following standard techniques may be used to prepare models (IGNOU, 2000):

- Use cheap materials such as cardboard, wood and are to prepare static models like models of a dam, a building and the like;
- Use materials like modelling clay and plastic line to produce realistic models of living creatures, organs of a human body, etc.;
- Use materials like plaster of paris and paper mache to produce a physical map of a continent, or a country, or landscape of a particular area.

Check Your Progress

Notes: a) Write your answers in the space provided after each item.

b) Compare your answers with those given at the end of the Unit.

Tick on the right option-

4.A) Poster

- a) represents Earth's surface

b) Has only textual message
 c) Is a type of flip chart
 d) Is symbolic representation of a single idea.

B) Distinguish between the two types of models.

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7.4.6 Overhead Projector (OHP)



Fig. 7.13: An OHP

Source: <http://i.classificadosmil.com.br/i-a/Ltxd-14.jpg>

Overhead Projector (OHP) helps in displaying still visual material as projection on a screen. It is a simple projector which is very easy to operate and therefore, popular among teacher. It is better than using chalkboard as it helps teacher to talk and show visuals at the same time. As a teacher, you can observe the reaction of students and interact with them. It also helps in saving time as you can use these visuals / transparencies again and again. OHP does not require a darkened room and is easy to handle and transport from one classroom to another.

You need to use visual material either textual or pictorial by preparing transparencies.

Transparencies need to be designed and developed for achieving the objectives of the teaching-learning. There are two forms of OHP transparencies. One is single transparency. If you want to use ten transparencies, then you may have to make ten single transparencies. Second is using a continuous roll of OHP transparencies. As you proceed with your classroom teaching, you unroll and show it over OHP platform.

Single transparency – Thick transparent Acetate sheets are used to display visual or textual material while talking in class. They can be stored in boxes with blank sheets of paper in between two transparencies to ensure that they do not stick together.

Continuous roll – OHP has provision of winding acetate rolls from one end to other. You may start from one end to use it as you proceed through the class. Some may use it in lieu of chalkboard. Some may use it for calculation, derivations, etc. Roll may also be used where visuals need to be shown in continuity for better comprehension.

Points to be kept in mind while preparing OHP slides.

- 1) As blank acetate sheets are slightly larger than the top glass frame of OHP. You should leave margin on all four sides.
- 2) Prepare slides in landscape or horizontal position. If you need to use in portrait or vertical position, try not to use bottom 1/3rd portion.
- 3) Use water-soluble or permanent marker pens according to context. When the slides are to be reused again, use of permanent pens are preferred, whereas for one time use of water-soluble pens are preferred.
- 4) Bold strong colours like Black, Red, Blue, and Green are preferred as they provide good contrast on transparent sheets.
- 5) Preferably eight lines should be written per transparency and eight words per line. This makes it readable with naked eye from 2 meters enabling students sitting at the back to read it clearly.
- 6) Ensure that all students can see the whole screen. Larger the screen used better is the projection showing the details.
- 7) While teaching progressive disclosure of the slides should be used. The transparency is totally covered with paper. You reveal the portion being discussed in class progressively as the classroom teaching proceeds. This helps the learners in concentrating on the topic being discussed and keeps alive the curiosity about the next point to be discussed.
- 8) You should face the class while explaining a concept with help of OHP slide. The presentation speed should be controlled.
- 9) Use pointer to focus on point being discussed.
- 10) Switch off projector when not needed.

Check Your Progress

Notes: a) Write your answers in the space provided after each item.

b) Compare your answers with those given at the end of the Unit.

5) Fill in the Blanks

A) OHP transparencies are made up of

B) OHP slides should be made in position.

C) OHP helps teachers to while showing the visuals.

D) While using OHP progressive of transparency should be done.

E) If you have to show derivation of a theorem which type of slides, you will use

7.4.7 PowerPoint Slides

Slides are very effective as they combine the advantages of OHP slides with versatility of computer. Images, animations, text, etc. can be inserted in power point slides which make TLMs useful and effective. They can be easily used for small as well as large audiences. They can be reused as many times as you want.

They can be used for classroom teaching as well individualized study. While making slides, following points as given below should be focused.

- 1) Appropriateness – It refers to the simplicity of slide presentation. Content should be according to level of the learner. Each slide should be contextualized. Graphics are preferred visual than tables.
- 2) Accurate – The content should be accurate. Word spelling, graphical data, quotation, etc. must be double-checked for accuracy.
- 3) Legible – The text in the slide must be readable. Font size should be higher for Titles – 36-42 whereas 24-32 for text on slides. The distance between the lines should be 1.5 – 2. 50-70 characters including spaces and punctuations, per line, sans serif fonts (Arial, Impact) are preferred for title and headings, though they do not look too good in bold. Serif fonts like Times Roman, Souvenir, Serifa are prepared for writing the text slides.
- 4) Comprehensible – The slides should be comprehensible to learners – For this:
 - Use one line per point and use brief phrases. You can elaborate in it during classroom teaching;
 - Use one slide per minute, if you are running through;
 - Do not cram everything on the slide;
 - Do not copy tables or photographs from books;
 - Use abbreviation, which are universal;
 - Avoid complicated figures as they may confuse the learners.

7.4.8 Audio Materials

Your voice is the most common form of audio medium, which may be used in classroom teaching. You use voice to communicate with others. Voice creates sound, which delivers message to others.

Sender – —————→ Sound/message —————→ Receiver

In a classroom when a teacher talks the message is sent to students in the form of sound. It is one of the most natural ways of communicating.

To make your voice effective medium of communication you should modulate your voice; express your feelings; emphasis, pause at appropriate places. The skills of using voice as an effective classroom transaction are integral part of teacher training programme.

Many audio TLMs are available to help in making classroom teaching effective

Audio CD/DVD

Audio recordings in form of CD or DVD are very popular TLM. Stories poems, songs are frequently used in elementary classes. Discussion and debates with important personalities can be recorded and prepared in form of Audio CD to be used in classroom to motivate students. NCERT, NIOS prepare Audio CD/DVD for children which are very effective TLMs.

You can use a DVD or CD players with speakers in your classroom to see these audio CD/DVD. You may also prepare your own audio CD/DVD. Using your

mobile, voice recorder or softwares on computer, you will read about these in detail in next section.

Radio

Radio is a popular mass medium, which has been with us from very early times. These days all of us are tuned to Radio through FM channels. Popularity of Radio is due to its easy access, speed and immediacy. Back in 1917 radio was visualized as means for mass education. In India, first radio station was established in Mumbai (Bombay) in July 1927. Two more radio stations in Calcutta and Delhi were established in 1936. All India Radio (AIR) broadcasted radio programmes for the country. In 1937 Calcutta station broadcasted school programmes for the first time and it continues till date.

School educational programmes are still in demand and are used by teachers to generate interest of students. **Gyan Vani** is a dedicated FM channel for educational broadcasts. It is used to broadcast educational programmes from Educational Media Production Centre (EMPC) of Indira Gandhi National Open University (IGNOU), New Delhi. Audio programmes developed by Central Institute of Educational Technology (CIET) of NCERT for school children are also broadcast by Gyan Vani.



Fig. 7.14: A Radio

Source: <http://commons.wikimedia.org/wiki/Radio>

Radio is used to-

- broadcast lectures by eminent educationists, scientists, etc.
- broadcast drama, stories, commentary, news, etc

Radio is popular all our country, urban as well as rural, settings.

While preparing Radio programmes selection of topic is very essential. Topic should support verbal communication i.e. verbal inputs are needed to topic. Sound, music, special effects are added to audio programmes to make it interesting and effective. It helps in creating visual images through sound and thus enriches imagination in children, CIET, State Institute of Educational Technology (SIET) and educational technology divisions of SCERTs produce topic and need based audio programmes for school children.. IGNOU also produces audio programmes for its student teachers enrolled in teacher education programmes. .

Podcasts



Radio is a mass broadcast medium whereas Podcasts are personalized broadcast. Podcasts are prepared for specific target and made available to the target group for specific learning objectives. Podcast is portmanteau of words ‘pod’ from iPod and ‘cast’ from broadcasting

You want to narrate a story to your class. You record it and play in your classroom teaching. If children want to hear it at home. You can make it available through Podcasts. Podcasts can be easily made using computer software.

Podcasts are uploaded on web to be listened at any place and anytime. Students can download it to hear at any convenient time and place.

Check Your Progress

Notes: a) Write your answers in the space provided after each item.
b) Compare your answers with those given at the end of the Unit.

6.A) How will you make your voice an effective medium of communication?

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B) True or False

i) Educational Radio Broadcast is known as Rainbow.

ii) Podcast means personalized Broadcast.

iii) Radio can be listened to at any time according to one’s convenience.

iv) Podcast can be used at any time by anyone.

7.4.9 Audio Visual Medium

It is the most effective of all TLMs as it is nearest to reality and thus generates interest and motivate learners. Televisions, Video, Multimedia programmes, interactive video are audio-visual TLMs used by Teachers.

Television –



Fig. 7.15: A Television

Source: <http://commons.wikimedia.org/wiki/Television>

Children are extremely fond of cartoon networks on Television. In a similar manner if we have Audio Visual TLMs for capturing the attention of children, then learning will be interesting and effective. Gyan Darshan of IGNOU is a

Channel dedicated to educational programmes. Educational programmes prepared by CIET for children are regularly broadcasted. SIETs produce programmes in local languages for children.

Television is useful as it brings to children a wide variety of programmes in their local language. They can use it to learn about new things and then clarify the points they did not understand with their teacher.

As a teacher, you should try to prepare children to watch the programme. You should ask questions related to the topic being telecast on TV. This will raise their curiosity level and they will be more alert and focused while watching the TV programme. After watching the programme, there should be discussion. This will help in retention of the points learned and helps in consolidating the learning. Both pre and post screening discussions are important as they help in concept construction among learners.

Video CD/DVD



Fig. 7.16: Video CD

Video programmes are developed on specific topics to be used in classroom teaching. A script is prepared and the programme is developed using cameras. Professionals generally develop video programmes. Though as a teacher, you can prepare short films for your students and make them available through CD or DVD for them to watch in class or later at their home. Video programmes may be run on DVD player as well as computer. CIET of NCERT has developed many Video CD and DVD s for school children National Institute of Open Schooling (NIOS) develops programme for children. Besides many private organizations also develop programmes but the cost is more and thus not all children can be benefited by theses video programmes.

Computers



Fig. 7.17: Children with Computers

Source: <http://commons.wikimedia.org/wiki/File:Computerkids.jpg>

Computer is the modern day wonder, which has penetrated all spheres of life. As a teaching learning material, its potential is enormous. It supports group as well as individualized learning and this increases its scope of use in variety of situations and variety of ways. A computer can record, analyze, interact with students, store and manipulate data on an extensive scale.

It may be used as a TLM in variety of ways. You can use it for various purposes.

- Give practice to students especially in math and languages. A student is presented with a series of exercises, which he/she has to do, and the computer gives the feedback. This helps students in practicing the new learning.
- Provide the learning material in small units and gives immediate feedback and this reinforce further learning.
- Games are great stimulator for learning. New concepts may be introduced through games.
- Animation is another feature possible on computers. Children love animated programmes. Thus, animation may be used to capture their interest to teach difficult and affective domain topics.
- Simulate the complex topics and help students to understand. Topics like cell , its organelles, photosynthesis may be simulated on computers for better understanding.
- Interact with learners at each step for them to be motivated to learn further.

When computers are used for teaching learning process it is called Computer Assisted learning (CAI) or Computer Mediated Learning (CMI). Here the computer interacts and communicates with the learner according to the predesigned programme. The students are guided through the new concepts in a predetermined manner. The computer interacts with the learner at every step and thus it is interactive learning and the learner is always active.

You should use these TLM as making the teaching learning effective in your classes. You should use the type of TLM which is appropriate to the concept taught.

7.5 PREPARATION OF LOW COST TEACHING LEARNING MATERIALS FROM AVAILABLE LOCAL RESOURCES.

You want to use Teaching Learning Materials (TLMs) to teach your class. What will you do? You will go and buy it. Oh! The model and chart you want are very costly. The school has not enough budgetary provision for costly TLMs. What should you do then? You also realize that you can easily design and prepare the chart with little cost.

You are right. You can easily make many TLMs with the helps of locally available materials. The waste materials like used wrapping papers, cardboards, etc.can be used to prepare TLMs. You will be able to design and develop TLMs at low cost using waste materials. Also the locally available materials can be used which will not be costly and you will be able to use TLM in your classroom teaching without financial burden. It will also give you an opportunity to involve

your students in creating TLM. (details in 7.6). Let us discuss how to make teaching learning material using local resources with some examples.

- A) **Making a Neighborhood Map**-You want to teach children about their neighborhood and want to use map for teaching. How to get a map of the neighborhood? It will not be available in shop. You can make map of the neighborhood with the help of help of students and community. You can request children, their parents or your neighbors to help in developing neighborhood map.

Steps

- 1) Procure a large sheet of paper and coloured papers to draw the map.
- 2) Sit in-group and identify important and most frequented places in the neighborhood.
- 3) Make a list of places. Also, select pictures and symbols to represent those

places like...  for house,  for doctor, etc.

- 4) Start from your school. Make it in the middle so that you can map the surrounding neighborhood. Indicate the roads and important places in vicinity.
- 5) Then you can move around in maps and make the important places and the roads connecting.
- 6) You will get a neighborhood map to teach your learners.
- 7) The map will help you in teaching Neighborhood to children in your class. It will generate their interest as it reflects the learner's own lives. Thus, you are able to use map at a very low cost.
- 8) Maps can be used for community's natural resources; level of education; out of schoolchildren, etc.

B) Flannel Board

Flannel boards can be used in classrooms in variety of situations. Advantage of using a flannel board is that it provides flexibility of using material to teach students.

Steps in making the flannel board:

- A plywood board of desired dimension should be obtained;
- Cloth like Velvet, Wool blanket or any other hard textured cloth can be used. The cloth needs to be stretched and fixed on the board with the help of nails;
- Flannel boards are used to display pictures, messages. You can add, move the pictures easily on flannel board;
- For pictures to stick on flannel board a small piece of sand paper or two-way tape should be used on the back of the pictures.

C) Low cost Experimental Aids

- i) Expansion of Gases- A simple experiment to show this can be made from a fused bulb, a balloon, a candle and a match stick. The steps involved are described briefly here.
- Remove inner content of fused bulb. Ensure that no sharp edges are left.
 - Fix a balloon on the open end of the bulb
 - Heat the bulb.
 - The gases expand and thus the balloon will blow up.
- ii) Expansion of Liquid can also be demonstrated. You will need additionally, to earlier experiment of gases, a cork and an empty ball point refill. The steps involved are described briefly here.
- Empty fused bulb.
 - Fix an empty ball point refill inside the cork.
 - Fill the bulb with colored water as expansion will be more visible in coloured water.
 - Fix the cork on the bulb.
 - Heat the bulb.
 - You will see the water over flowing through the refill. This shows that gases expand on heating.
- iii) Use of Cardboards- Cardboards may be effectively in teaching concepts in math. Shapes, sizes, addition, subtraction, multiplication, fraction, etc, can be taught using cardboards.
- iv) Use of Match Sticks – Match sticks may also be used for teaching children geometrical shapes. Two sticks may be joined by a bicycle valve tube or any other narrow tube material.

The above examples are suggestive list of low and no cost teaching and learning materials. You can try to make a large number of TLMs at home at no or very little cost. You only have to let your imagination run free and you will realize that you have a basket full of TLMs to choose and use.

Educational resources are also available as open resources on internet for teachers to use. It is known as Open Educational Resources (OER). As a teacher, we may not reinvent the wheel again but use the teaching learning materials available on internet and released for others to use, adapt, modify, reuse and distribute with proper acknowledgement to the original author or the creator. Visit http://en.wikipedia.org/wiki/Open_educational_resources to learn more about OER.

Check Your Progress

Notes: a) Write your answers in the space provided after each item.

b) Compare your answers with those given at the end of the Unit.

7.a) What is the advantage of using Audio-visual materials?

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b) Why should we make TLMs at low or no cost?

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7.6 PARTICIPATION OF STUDENTS IN COLLECTION, PREPARATION AND MAINTENANCE OF TLMs

The basic philosophy of TLM is that teacher is a part of the whole process of collection, preparation, and maintenance of TLMs. Whether the TLMs are to be procured or prepared, you, as teacher, should involve students at each stage. This helps in developing in students a feeling of ownership and commitment towards the school and its resources. Proper utilization, care and maintenance of all these and such other resources constitute a vital aspect of classroom and school management.

The material used to prepare the TLMs should preferably be available locally and easily procurable. This will reduce the cost of the TLMs and thus you will be able to develop TLMs at low or no cost. Involvement of students in design and development of TLMs inculcates in them confidence and positive attitude toward TLMs and its use in the classroom teaching-learning process. Therefore, as a teacher, you must ensure that all the students are involved in design and development of TLMs. This will be done in three major steps as listed here.

- Collection
- Preparation and
- Maintenance

Before involving students in the design and development TLMs, need analysis should be done focusing on the material required for the process.

7.6.1 Collection

This is the first step towards the development of TLMs. Students in school come from diverse backgrounds and, therefore, have access to a large variety of materials for preparation of TLMs. Students should be encouraged to use their imagination and be innovative in their collection of materials for the TLMs. Students should:

- Make an analysis as to what material could be used in preparation of TLMs;
- Explore the local neighbourhood area for collecting the materials;
- Collect scrap and discarded, usable material for making the TLMs. This will have a positive effect on local environment as recycling and reusing of waste material helps in conservation of environment;

- Materials like sticks, bamboo, plastic, rubber cardboards, ply, wood, wires, pins, etc can be easily procured from households;
- Collection of materials should be an ongoing process and continue throughout the year;
- Start from your own household and then to neighbourhood and then farther to community. The purpose of such collection should be shared with others;
- Collected materials should be reviewed on weekly basis and categorised on basis of the nature of material;
- Collected materials like plastic, wood, pins, glass, cardboard should be kept separately;
- Students should share their experience of collection of materials in the class. This will help in sharing idea of collection amongst the class. At the same time, the whole experience will help in confidence building and leadership skills in students;
- The collection of materials for TLMs will help students to be environmentally aware and thus a long commitment towards reusing resources, minimising wastage will be inculcated at early stage in life.

Involvement of students in collection will help in achieving affective objectives as well which are generally not developed in the classroom teaching-learning process.

7.6.2 Preparation

After collection of variety of material for the preparation of TLMs, the next step is actual preparation of TLMs. The TLMs should always be designed according to the level of students.

Teachers should guide and facilitate students to construct simple TLMs themselves. Students should be divided into groups and each group be assigned the task of design and development of TLMs. As a teacher, you may adopt many strategies in motivating students.

- You may ask all the groups to work on one TLM. This will give you different TLM on the same topic. Thus, creative differences amongst the group will be exhibited.
- Students should be allowed to construct simple TLMs themselves. As a teacher, you should only provide guidance when sought.
- Students should be encouraged to improvise in preparation of TLM.
- TLMs should illustrate the teaching point clearly. Do not overcrowd with many points, pictures, or words.
- TLMs should be as simple as possible. This makes them easier for the learners to see and understand. Leave out too much details and backgrounds as these draw attention away from the teaching point.
- TLM should be proportionate and to the scale. Making an object too small or too large from its actual size will hinder in transference of learning.

- It is advisable to pre-test the TLMs. Pretesting may be done on the students or through discussion with fellow teachers.
- Preparation of TLMs will vary according to the nature of TLMs.

Let us see few examples of TLM preparation:

Poster/Charts- The students should make a framework and write a script as to what all should be included in the poster or chart. Pictures available in magazines should be collected and used for making the chart. Overcrowding of concepts or information should be avoided. Students who are good in drawing should draw the diagrams or figures. Appropriate colours should be used in the figure and diagrams to make them attractive. Students who are not so good in drawing should be involved in other tasks like making margins, labelling, mounting, and other tasks. The preparation should truly be a collaborative effort.

Models- students should make a blue print of the model and list of material required for making the model. Also decision as to make a working or non-working model should be taken collectively. After browsing through the available collected materials, the extra material needed should be procured from local available market. Emphasis should be on use of locally available resources so that the cost involved is minimum. Class should be divided into groups. Each group may be assigned a particular task to prepare a part. After all groups have prepared the different parts, teacher should facilitate the assembling of the different parts to complete the model. For example if you want to prepare model of 'solar system', different groups should be assigned to make different planets and then at the final stage, all planets can be put together to construct 'solar system'.

Audio based TLM- After deciding what should go as audio TLM a script may be developed collectively. If a poem is to be used then students should be encouraged to sing the poem with proper modulation. You can ask many students to narrate poems and record them. The best narration may be finalised as audio TLM to be used. This will involve all students and imagine the level of involvement in this activity. This activity helps in attainment of cognitive as well as affective objectives in teaching and learning.

Video films as TLM can be prepared using mobile or digital camera. Important processes in the neighbourhood can be captured to facilitate concept formation among children. For example, how animals are used for manual work; how potters make utensils; how waste is treated in the community. Students may be taken to the site and the recording may be done and used as TLM

PowerPoint slides can be prepared on computer. You may give a topic and let students prepare power point presentation in groups. Then, a collective review of various powerpoint slides can be done and good slides from the various powerpoint presentations may be collated to make a good TLM for teaching children.

7.6.3 Maintenance

As a School teacher, you must understand and learn the basic principles and procedures commonly applicable for maintenance system of TLMs anytime and anywhere. Some of the general principles are listed below:

- Proper and adequate storing space should be made available for upkeep of TLMs;
- TLMs should be neatly arranged and maintained;
- All the TLMs must be well maintained. TLMs should be checked periodically for any damage and repairs be carried out as and when necessary;
- Item-wise inventories listing all the TLMs placed in the room may be prepared and displayed at many locations in the storing space. This will help in ready referral;
- All the TLMs whether purchased or prepared must be correctly entered in the stock registers and maintained in good condition;
- TLMs shown in the school stock must be frequently checked, physically verified and controlled to ensure their optimum and effective use and proper storage;
- TLMs procured and earmarked for specific use should not be misused or wasted;
- Students should be involved in this process of maintenance as in the collection and preparation stages. They should check regularly the status of the TLMs and any fault or deterioration may be brought to the notice of the teacher.

Maintenance is an important activity as it instills and inculcates in children the importance of sustainability. You know it by experience that many TLMs get damaged or broken through continuous use over a period. For example, a chart after being used many times will get crushed at places or torn at the edges. If such TLMs are not periodically serviced and repaired quickly, they will be further damaged and will become unusable eventually. If you remember an old saying, a stitch in time saves nine stitches later. Timely repair of all such TLMs enhances their utility and life span. So, maintenance of TLMs should be done in a well-planned and designed system of checking, servicing, repairs, and replacement of TLMs. It is strongly advised that spending a small amount of money on quick and timely repair is a wise decision indeed. In case of costly equipments like electronic gadgets a system of Annual Maintenance Contract (AMC) may be given. This is highly recommended for maintenance of all costly TLMs as well as laboratories.

7.7 LET US SUM UP

Teaching learning materials (TLM) are designed and developed towards achieving the learning objectives. TLMs are, therefore, tools, which are used by teachers to help learners to learn concept with ease and efficiency. TLMs have been in existence in our educational system since ancient times, (Lal, 2011). The role of TLMs in the classroom is to make learning real, practical and fun for children. Teachers use TLMs to illustrate or reinforce a skill, fact or idea. TLMs also help in bringing novelty and freshness in classroom teaching as they relieve learners from anxiety, fear and boredom. They help to provide a range of learning experiences to learners from direct to indirect. TLMs are used to enhance the learning of students in classrooms. A teacher uses it to make teaching learning effective. It also helps learners achieve the learning outcomes after classroom teaching and learning. Some reasons to use TLMs in classroom are:

- Motivate Learners;
- Longer Retention of Information;
- Wholistic on Integrated Learning;
- Organizing Classroom Teaching;
- Facilitate change in Attitude;
- Application of theoretical knowledge into practical applications;
- Making learning fun in the classroom;
- Facilitate the concept formation and attainment among children.

Therefore, use of TLMs in classroom teaching is an essential aspect about which you should focus your attention while designing and developing your lesson. There are a variety of TLMs to choose from depending on the context, level of learner and availability. TLMs based on the senses they stimulate in learners can be classified into three categories.

- Audio
- Visual
- Audio Visual.

You can easily make TLMs with the help of locally available materials. The waste materials like used wrapping papers, cardboards, etc. can be used to prepare TLMs. This way you will be able to design and develop TLMs at low or almost no cost. Also the locally available materials can be used which will not be costly and you will be able to use TLMs in your classroom teaching without financial burden. The basic philosophy of TLM is that teacher is a part of the whole process of collection, preparation, and maintenance of TLMs. Whether the TLMs are to be procured or prepared, you, as teacher, should involve students at each stage. Therefore, as a teacher you must ensure that all the students are involved in design and development of TLMs.

7.8 UNIT END ACTIVITIES

After going through the unit, try the following activities:

- Find out the various textbooks available for the classes you teach, other than the ones you are using;
- Prepare a chart on a topic of your choice with the help of students;
- Prepare a PowerPoint slide presentation on a community related topic;
- Prepare a local neighborhood map;
- Prepare any TLM from local resources at low or no cost.

7.9 SUGGESTED READINGS AND REFERENCES

- Lal, H. (2011). Manual of Low Cost Technological Aids. Faridabad: Sai Publications.
- Kumar, K.L. (1996). Educational Technology. New Delhi: New Age International.
- IGNOU (2000). Educational Technology: State of the Art. New Delhi: IGNOU.

Web Resources

- http://en.wikipedia.org/wiki/Open_educational_resources
- <http://www2.education.ualberta.ca/staff/olenka.Bilash/best%20of%20bilash/Images/dalescone2.gif>
- <http://www.egyankosh.ac.in/bitstream/123456789/33122/1/Unit10.pdf>
- <http://www.egyankosh.ac.in/bitstream/123456789/33123/1/Unit11.pdf>
- http://www.ischool.zm/media/ptddl_m1_wholemodule.pdf
- <http://www.sil.org/lingualinks/literacy/referencematerials/glossaryofliteracyterms/whatisateachingaid.htm>
- http://georgeyonge.net/sites/georgeyonge.net/files/Lesontwerp_Ch5.pdf
- <http://www2.unescobkk.org/elib/publications/nonformal/M5.pdf>

7.10 ANSWERS TO CHECK YOUR PROGRESS.

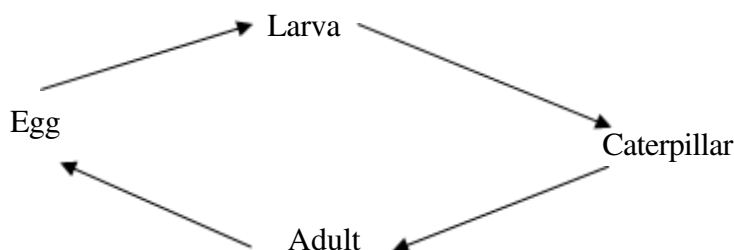
- 1) Teacher can make the class interesting by using it to motivate learners and making learning fun. TLM help in longer retention of information and facilitate change in attitude. It further facilitates the concept formation and attainment among children.
- 2)
 - 1) Visual-non-projected, two-dimensional
 - 2) Audio-visual TLM
 - 3) Overhead Projector
 - 4) Model, Globe
 - 5) It is closest to reality
- 3)

A) Map is a scaled down representation of real earth's surface on paper whereas chart is diagrammatic representation of any system, process or any other thing.

B) Various types of charts are

 - Physical maps, which show climate, soil, forest areas, resources, rainfall, etc.
 - Political map which show political divisions of countries and places.
 - Economic maps are those maps showing the crop distribution, land use, transport, etc.
 - Social maps, show demographic distribution, in country. The literary rate, language, tribes etc. are shown on maps for easy comprehension.
 - Historical maps show boundaries, of the empires, routes taken by travelers, places of war, treaties, etc.

- C) Process chart of a butterfly



- 4) A) d.
B) The two types of models are Stationary or non-working Model and working model.
- 5) a) Acetate sheets
b) Landscape
c) talk
d) disclosure.
e) Continuous roll.
- 6) A) You can make your voice effective medium of communication through modulating your voice; expressing your feelings; emphasis, pause at appropriate places while speaking.
B) True or False
i). False
ii) True
iii) False
iv) True.
- 7) a) Audio Visual Materials are nearest to reality. They are more appealing and interesting to students.
b) TLMs can be easily made from low cost from used or locally available resources. On one hand it helps in motivating and orienting learners towards local resources. It also helps in saving environment because resources are not wasted but recycled for good cause.