Notes

UNIT 6 TEACHING AND LEARNING MATERIALS

Structure

6.0 INTRODUCTION

In Block -1, you have learnt about different methods of learning and teaching process. While employing any of these methods in the classroom, you will often have to use several materials which help you in explaining the concepts and aid students' understanding. By using different types of teaching learning materials the students get direct experience which facilitates their learning. In this unit different types of learning materials and their use in teaching as well as in learning have been discussed with purpose to empower you to develop, store and use teaching-learning materials (TLMs) for facilitating effective learning in the classroom.

To complete this unit and comprehend different aspects of TLMs, you will need about *nine study hours.*

Notes

6.1 LEARNING OBJECTIVES

After completing this Unit, you will be able to

- State the need for different TLMs in learning.
- Identify different categories of TLMs for classroom use.
- Collect, prepare, store, and maintain the TLMs for students learning in the classroom.
- Develop and activate TLM corners in the class room.
- Use the textbook as the major TLM.
- Use other sources of TLMs beyond textbooks.

6.2 NEED FOR TEACHING LEARNING MATERIALS

When you are explaining a concept from geography, describing anevent from history, teaching how to recite a poem, or solving a mathematical problem in the class, you can make your presentation more interesting and more meaningful for the learners by using some objects or materials to aid your verbal descriptions. Using a large variety of materials in classrooms is found to enhance better understanding of concepts and for making learning more interesting. The Chinese saying, *"A picture tells a thousand words",* has relevance in this context.

Earlier materials were sparingly used mostly by the teachers as aids to teach in the class. But today with the rapid change in the emphasis from teaching to learning in a learner-centered approach, the learners need more and more materials of various types to enhance his/her capacity to learn in groups or individually. Therefore, learning materials can no longer be used restrictively as 'teaching aids'. They should rather be used by the students for learning and by the teachers for aiding teaching. Hence, appropriately such a material is called as *'Teaching-Learning Material'* and its acronym *'TLM'* is now universally in use. It is essential to have a better understanding of the nature and types of these materials, viewed from the perspectives of effective management of teaching-learning in classroom, so that they are used effectively for facilitating learning.

But what is the need for TLMs in the teaching learning particularly for the learners at the elementary stage of schooling? Both from psychological and educational points of view, the concrete materials are essential for facilitating learning for several reasons some of which are as follows:

- Learning of new concepts becomes easier if the learner is presented with familiar materials related to the concept.

Notes

Let us consider the following situation:

Situation 1: *One day Ms.Seema, the teacher of class 2, brought several types of fruits and vegetables in the class and asked the children to identify them. The children identified the fruits as apple, orange, guava, and mango and the vegetables as green banana, brinjal, red tomato, and green papaya. One of the items they could not identify which generated discussions as follows:*

Ranu: "It looks like a green tomato, but its skin is neither shining nor smooth."

Gina: "Perhaps it might be a type of brinjal, but it is bigger in size than that of a big tomato."

Rehana: "Well it is not as soft as brinjal or tomato."

Jasmine: "Could it be a guava? Can we eat it raw without cooking? (With the permission of the teacher Jasmine tasted a bit of it).

Zinat: "Is it a fruit, or a vegetable?"

Jasmine: "No, it cannot be a fruit because it is not tasteyl."

The teacher then intervened and clarified, "Yes, it is not a fruit, it is a vegetable called 'Gromato' developed recently by cross breeding the seeds of brinjal and tomato. That is why you could draw so much similarity with those two vegetables."

Children as well as adults start acquiring their experience from their direct observation of familiar objects or events. Whenever a child comes across a completely new object he/she tries to superimpose the characteristics of the known objects on it for identifying the object and its nature. If he/she has familiarity with quite a large number of objects, then it would be comparatively easier for exploring the unique characteristics and those similar to other objects..

- Senses are the gateways of learning. Perceptions become clearer when things are sensed in different ways such as by seeing, hearing, touching, tasting, and smelling using the sense organs. Materials of different colours, sizes, textures, odours, and tastes sharpen perception and thus make learning easier especially at early age.

  According to Piaget's Stages of Cognitive Development, up to the age of 11 to12 years, sensory manipulation of familiar and concrete objects help in development of cognition. Specifically, during the Concrete Operation Period from 7 to 12 years, that is when the child is in the elementary school, the mental activities are carried out with the help of manipulating concrete and familiar objects.

Notes

At this stage remarkable milestones in the development of thinking or cognition like acquisition of reversible operations (like subtraction is reversible addition vice versa), attainment of classification and seriation of objects, comprehension of conservation of substance, weight, volume, length, surfaces and wholes are possible because of concrete operation of objects and not due to any verbal explanations or interactions. The child at this stage cannot properly carry on any thinking which involves manipulation objects in imagination without actually handling them. Hence, they are incapable of abstract thinking using *'If…then'* logic. For example, when a child at this stage is asked, *"Those having wings can fly. If cats have wings, can they fly?"* It has been observed that most of the children refuse to answer this question. Some typical responses are*, "But cats do not have wings.", "Cats can run and cannot fly.", "Why should a cat fly?"* The children at this stage refuse to shift from their real experience and objects and materials around them constitute their reality. The more they interact with the objects the better is their cognitive growth which is essential for effective learning. It is difficult for the child in this age group to comprehend any concept in absence of the objects. Therefore, during the period of elementary schooling, enough of scope for manipulation of concrete objects of various dimensions needsto be created for a healthy growth of thinking and understanding.

- Piaget's work has also found that children, who are efficient in manipulating concrete objects before attaining 12 years of age, acquire abilities to carry on abstract thinking comparatively at quicker pace than those who are not as efficient in manipulation of concrete objects. This emphasizes the essential need of TLMs in the stage of elementary education.

- Children like to play with variety of materials and they easily get engaged in manipulating with materials. When an appropriate task is given with sufficient and appropriate materials, the children get naturally attracted to the materials and like to use the materials for the completion of the task. A task without any material seems quite boring and burdensome for the children and this feeling from the beginning makes completion of the task very difficult.

- Usually small children are attracted to objects of different colours and sizes and show their curiosity in manipulating these in various ways which when nourished carefully helps to develop a habit of playing with variety of objects. This helps in enhancing their creativity.

- Various materials relating to the desired objective of learning can play vital and positive roles in breaking the monotony of the teacher-centred classrooms which in most cases emphasized rote learning. The very presence of materials before the children moves them spontaneously to play and manipulate with these materials thus making them active learners. These materials help the children to participate in the learning activity in a lively manner minimizing their passive hearing.

- TLMs are needed for effective self-learning. With use of appropriate materials, one can learn at his/her own convenience with total control over his/her pace of learning.
- In case of multi-grade and multi-level situations, TLMs provide vital help to the teachers for effective management of their classes.
- By using TLMs the attitude of teachers become very friendly. While explaining models, displaying exhibits or taking the children to outdoor places, a friendly atmosphere is built which greatly helps in proper learning.

Now answer the following:

E1. In which of the following situations you DO NOT need TLMs for facilitating students' learning?

A. Teaching problems on work and time.

B. Group work on writing story.

C. Learning meditation and yoga.

D. Studying weather changes.

Characteristics of Good TLM:

Given below are some characteristics of a good teaching learning material.

- The TLMs need to be *attractive* to the children. Size, colour (multi-colour or brilliant or appealing colour combination), movement (like moving toys) and in some cases the smell or/and taste or sound are some of the attributes of the materials which attract the attention of young learners.
- *Familiarity* of TLMs will help to introduce new concepts. The children can also manipulate these materials with ease for meaningful learning of new concepts.
- *Novelty* of the material also attracts the children. Unusual materials or novel use of the familiar materials are the attractive features of good TLMs.
- The material should have *utilitarian* value. No material is a good or bad TLM, it is in the proper use that makes the material good or bad. A beautiful and attractive flower increases the aesthetic sense but is not a good material to teach the properties of a square.
- Materials of *multiple utility* like dice, sticks, marbles, cubes and flash cards can have multiple uses in nearly all subject areas of elementary school curriculum and are hence more in demand as TLMs in the schools.

Notes

- *Ease of handling* the materials which includes sturdiness (strong enough for rough handling), light weight, and safety (harmless for use by children) is an important characteristic for which such materials are preferred in the teaching learning process.

ACTIVITY-1

Prepare a list of materials like dice and marbles which have multiple uses in different learning activities of different subject areas. Indicate the names of such materials, the learning activities and the subject (with grade/class) in which each material can be used.

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E2. Give examples of using 'Dice' as a TLM in teaching Language and Mathematics (two examples in each subject) in Class II.

6.3 CATEGORIES OF TEACHING LEARNING MATERIALS

From the above discussions, we can say that any object or material that is used to facilitate learning and teaching can be considered as a teaching-learning material (TLM). In other words any material suitable for use in teaching is invariably a learning material. For the benefit of acquiring, storing and using different materials in the classroom for teaching learning activities, the materials can be classifiedin several convenient ways.

6.3.1 Types of TLMs

Consider Situation 2given below which highlights different teachers teaching mathematics to class III students. Note the differences.

Situation 2:

- *Mr. Raman is teaching "division of numbers" in class III. He is using only chalk and duster and explaining everything by writing on the black board while students are copying down the same in their note books.*
- *In another school, Ms. Lila had asked her class III students to come with some pebbles or small sticks. She made the students sit in small*

groups and demonstrated how to divide the pebbles or sticks into some groups of same number.Each group was given 30 pebbles or sticks and was asked to divide the given number of materials into as many collections as possible with equal number of materials in each collection. She then asked each group to say the number of ways they divided the materials.

Ms. Sabnamon, the other hand , developed a 5× 6 matrix as shown in Fig.6.1 on 10 sheets of paper and gave 2 sheets to each of the five groups and asked them to shade/paint equal number of small squares(2, or 3, or 5 small squares in one division) using one colour for each group of small squares and then to find out how many such group of small squares have been formed.

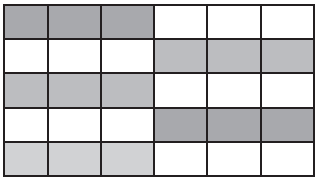

Fig. 6.1 Division Matrix showing 30÷3=10

- *In the fourth situation, Samir led all the children from the classroom to the school garden and provided them some small seedlings to plant in a certain number of rows with equal number in each row. Then he asked them to tell how many seedlings have been planted in each row.*

E3. In which one of the above three situations, do you think students might have faced maximum difficulty in understanding the process of division of numbers? Why?

In the first situation, Raman was virtually using no material except chalk, duster and the blackboard and it was a traditional teacher dominated classroom where the students were passive. In the second instance, material like pebbles or sticks were real objects collected and brought by the students and Ms. Lila was facilitating group learning after demonstrating the process of division using the materials. Ms. Sabnam developed some materials by herself and gave the students to act on it to carry out the basics of the process of division. Unlike others, Samir took the students out of the classroom to the garden and helped the students to perform the real life activity of planting the seedlings through which they learnt the process of division.From these examples, we can categorize the teaching learning materials as *Real Objects/Experiences* and *Prepared/Developed Materials.*

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(i) Real Objects/Experiences

The students get first hand experiences by directly using real objects, persons and events around them. However, possession of objects may not lead to learning. You must try to show the real objects to the students while teaching, so that they get direct experience of the objects with reference to the concept they are expected to learn. But for reasons given below, it is not always possible to bring the real objects to the classroom.

- *Size of the object*: Too large in size to carry or to store in the classroom or too small to be seen by the students.
- *Safety*: If dangerous, species like snake, scorpion etc. are to be brought into the classroom it could affect the safety of students.
- *Cost*: Objects cam become too expensive for class use.

In teaching Environmental Studies in lower classes and Science in higher classes, many direct experiencescan be given to the students for effective understanding. Children get direct experience from several objects or places existing in their immediate environment like observing real flowers, leaves, plants, insects; taking a walk in the forest and collecting useful forest products; going to different organizations like *Panchayat* Office, Bank, Post Office and observe their functioning; setting and maintaining an aquarium. Direct and concrete experiences help students understanding of difficult concepts.Hence, attempts ought to be made to give your students as many experiences as possible.

ACTIVITY -2

Prepare a list of objects, activities and institutions to which you can give exposure of direct experiences to your students

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(ii) Prepared TLM

We are familiar with materials specifically prepared for teaching and learning particular subjects or topics. Maps, charts, pictures,models, toys, marbles, coloured sticks, flash cards, number and alphabet cards are examples of some of the most common prepared TLMs known and used by teachers. For our classroom requirements we acquire these materials in two ways: (i) procuring from the market (ii) developing by ourselves or sometimes involving students.

Standard TLMs like maps, globes, charts, scales, measuring tapesare usually purchased from the market. The cost of the materials varies according to their quality. Since most of these materials are manufactured and are finished products, they have better look and are comparatively more durable. That is why the teachers everywhere prefer them to purchase.

ACTIVITY-3

Do you always prefer to use purchased TLMs in your classroom activities? List situations where you do not find purchased TLMs to be suitable for use for your purpose.

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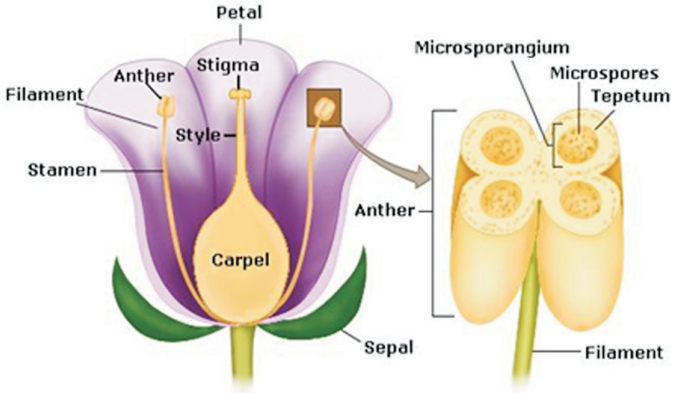
We not only purchase finished products like maps, charts, pictures etc. from the market to use as TLMs but also purchase materials like drawing sheets, sketch pens, colouring materials, gum, scissor, ruler etc. to develop/prepare TLMs by ourselves and by the involvement of our students. But why do we develop TLMs when they are available in market?

Possibly, because we cannot afford to purchase all the materials that we require and sometimes typical materials that we need in our classrooms are not readily available in the market. Let us consider the following situation.

Situation 3: *Ms. Sameeta and her students in class V were trying to develop materials for learning the concept of a complete flower (e.g., a flower like hibiscus in which all the four whorls – Calyx, Corolla, Andraecium and Gynaecium- are present).The students were asked to come with some flowers including hibiscus. She asked the students to observe the flowers very minutely and identify the main parts of each flower. Petals were of different colours and were identified immediately, followed by identification of other parts like stamen, calyx, etc. Then, she asked the students to see which parts were common to all the flowers they have collected and which of the flowers contained all the parts. After the students successfully identified the parts, Ms.Sameeta separated the flowers having all the parts (whorls) and called it a complete flower. Then the students, in groups, were given drawing sheets and drawing materials to draw and paint the diagram of a complete flower. On completion respected groups exhibited their pictures and the best two agreed by all were placed on the display board of the class. Later on these were stored in the TLM corner to be used in future as a TLM.*

(a) hibiscus flower



(b) vertical section of the hibiscus flower labelling the different parts

Such typical diagrams or pictures which you and your students need may not be available in the market. Very often you need less effort to prepare TLMs like folding a paper with a shape or a diagram or graph sketched on the board on the data brought by students. Such prepared TLMs have more relevance than the purchased readymade materials. Further, if you are involving your students in developing TLMs you might be observing their pleasure while working in such activities. What is more important is that in the process of planning and preparing the TLMs for use in the classrooms, the students are acquiring concepts with proper understanding and without the rigor of instruction or memorization.

ACTIVITY-4

Prepare a list of TLMs that you can develop in one subject area that you are teaching in class V/VI with materials collected from the locality.

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E4. State any three advantages of prepared materials over purchased materials.

Another way of categorization of TLMs is based on the audio and visual effects produced by the materials. Accordingly, there are three types of TLMs: *Audio, Visual and Audio-Visual*.

(i) ***Audio aids:*** The materials or devices which call upon the auditory senses and thus help the individuals to learn through listening e.g. Radio broadcasts, Cassette and CD player.

(ii) ***Visual aids:*** The aids which call upon the visual senses and thus help the learners to learn through viewing. The important and under this head are Black board, Charts, Pictures, Graphs, Models, Film strips, Slides etc.

(iii) ***Audio-Visual aids:*** The devices which require the auditory as well as visual senses and helping the students to learn through listening as well as viewing. Examples of such aids are television, films and computer-assisted instruction.

Still another way of categorizing TLMs is based on ***projected, non- projected or experiential***.

(i) ***Projected aids:*** Movies, epidiascope, magic lantern, micro-projectors and projection with the overhead projectors, LCD projector are examples of projected aids.

(ii) ***Non-Projected aids:*** Chalk board, felt board, bulletin board, photographs, posters, maps, charts, globes, specimens, and text book illustrations, come under non-projected aids.

(iii) ***Experiential Aids:*** Field trips, educational tours, visit to important institutions and industries, observing experiments , demonstrations and natural phenomena are a few examples of experiential aids

Notes

E5. In group "A" the names of different categories of aids and in group "B" the names of materials are given. Match the materials with respective category indicating by an arrow mark as per the example shown below:

Group-A	Group-B
Non projected aid	Television
Projected aid	Radio
Audio aid	Fish
Audio Visual aid	Stones
Collected aid	Black board
	Film strip

6.3.2 ICT and TLMs

Information and communication technology (ICT) has brought new possibilities in the classroom. Internet and interactive multi media are of great significance for teaching. It needs to be effectively integrated into the formal classroom activities for enriching the content and quality of teaching and learning. For this the teachers need to prepare themselves to keep pace with the application of technology in the classroom. Computers have already come into the classrooms of many schools and in near future most schools would have such facilities available for students.Use of ICT in classroom situation has been discussed in greater detail in Unit-12.

6.3.3 Activity Based Learning Materials

'Activity based learning', 'Learning through Activity' and 'Active Learning' are synonymously used here to mean the process the learner uses to acquire experiences by being involved in an activity. The activity may be physical or mental or a combination of both as in majority of learning activities. For example, when a child is using her knowledge of addition and subtraction to check the bills of the grocery shop, it is more of mental activity than physical. But, when she is planning and organizing an outdoor game, she has to combine her physical skills in playing the game with her mental organization of modes and strategies of play in order to win. Among other things, activity learning requires total involvement or participation of the student in the learning activity. For young children in primary grades, learning is more effective when the involvement is satisfying particularly to any of the five senses i.e. seeing, hearing, smelling, touching and tasting along with mental satisfaction. As these children advance in age and grade, they derive satisfaction more from thinking. In Unit 4 learning activity and its nature was discussed in detail.

But in all activities, the role of concrete materials is extremely important. Although, all the materials available can be used in different learning activities in the classroom, some care need to be taken while choosing the materials for specific activities. The materials should be chosen on the following considerations besides ensuring their characteristics as discussed in section.6.3 of this unit:

- Since, at the primary grades the learning activities are totally *related to the real life experiences* of the learners, the materials need to be chosen from their world of real life activities. Anything that supports or facilitates learning be it concrete materials from the immediate environment of the student or some familiar activities like playing games, singing, acting, etc. is to be chosen for conducting the learning activities in the classroom.
- The materials need to be *relevant* to the learning of particular concept(s) dealt in the learning activity. For example, in an activity on understanding the means and importance of transportation, articles like models and/or pictures of different means of transportation like carts, motor vehicles, train etc. are more relevant than any other material.
- *Direct experiences* like participating in exhibitions, field trips, study tours, visiting important institutions/organizations (like bank, post office, police station, railway station, museum, science laboratory) are also activities that promote meaningful and relevant learning.
- Mere collection of large number of materials is not enough for conducting an activity effectively. Their *contextualisation* at the appropriate stage of activity is also important.
- In the learning activities where a new concept is being introduced, both the materials that are *exemplars* of the concept and *non-exemplars* of the same concept need to be used for clear discrimination of the characteristics of the concept. For example, if the students are introduced to the concept of mono-cotyledons (plants having only one cotyledon at the time of germination) then materials like maize, paddy, coconut and palm (all monocotyledons) are to be used as examples whereas bean, pumpkin, mango, lady's finger, potato etc. of di-cotyledons may be used as non-examples. This will help the students to consolidate their understanding of the identifying features of monocotyledon through comparison of examples and non-examples of the concept. Simultaneously, the student will also have adequate knowledge of the di-cotyledons.
- The *adequate quantities* of the chosen materials for the learning activity are to be ensured much before the commencement of the activity. If you are conducting a group or individual activity on any topic (say categorization of fruits and vegetables), you need to collect the real materials (different types of fruits and

vegetables) appropriate to the number of groups or number of students. If it is difficult to arrange the real objects, then you can draw the pictures/flash cards or prepare models of the objects in sufficient numbers and keep them ready for use in the activity.

ACTIVITY -5

Develop more than one learning activity using sticks and leaves specifying the class for which it is meant. Justify the use of materials according to the characteristics mentioned above.

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6.4 MANAGEMENT OF TEACHING LEARNING MATERIALS

You might have experienced that on many occasions you do not use any TLM in your classroom transaction although you are aware of the requirement of some materials essential for learningthe concept that you are dealing with. Recollect the circumstances under which you could not use the materials.

Probably one or more of the following reasons can be attributed for not using any TLMs:

- No TLM or inadequate numbers of TLMs are available in the classroom.
- Appropriate or relevant TLMs are not in the store of the classroom/school.
- It is difficult to sort out the relevant TLMs from a huge collection of materials stored in the classroom/school.
- Many teachers think that use of TLMs takes more time and in turn slows down the coverage of course.

These reasons are indicative of lack of proper planning and management of procuring, using, and maintaining TLMs in the classroom. Currently funds are available under SSA for development or procurement of TLMs in the elementary schools and in most of the schools you can find quite a sizeable quantity of TLMs in different subject areas. Although, having a large stock of TLMs in every classroom is an advantage in itself, but, that is not enough to ensure their utility in facilitating learning. Therefore, you as a

teacher need to be well versed with the basic processes of management of TLMs in the classroom transactions.

The management of TLMs is required at three stages of classroom transaction: collecting, developing and procuring TLMs and arranging them before the start of classroom activities; proper use during the classroom activities; and rearranging and proper storing of the TLMs after the classroom activities are over to ensure easy access for subsequent use.

6.4.1 Collecting, Preparing and Storing of TLMs

- ***Collection of TLMs***

Usually TLMs are acquired either by collecting materials or preparing them or sometimes involvingstudentsto prepare. You can either collect no cost materials or purchase the required materials available in the market. We know that our immediate natural and social environments around our school are rich in materials which can be used for learning purposes. Think of any material in your immediate environment that can be a potential source for learning. There are many but only those which can be brought to the classrooms for use in the specific learning situations are the suitable TLMs and those materials can be collected from our immediate environment.

Besides collecting real objects from the immediate environment, we can also collect several TLMs which are not available in our near vicinity. Materials like different rocks and minerals, different types of food grains, feathers of birds etc. might be collected from our acquaintances or contacts at different places. These can also be collected from the market on payment.

Involving students in collecting materials for classroom use has several benefits. It will help you to have a huge collection with very little effort without any substantial cost. It would encourage students to explore the world around them and make them realize that every element in the immediate environment can be a source of learning. Such involvement of students in collecting, arranging by categories, using them in learning activities and storing and maintaining them in the classroom help these young students in their healthy cognitive growth which is very vital at the early stage of schooling.Developing a habit of collection of different materials is a very good hobby which has several benefits see box below.

Collection as a Hobby

Developing a habit of collecting specific materials can be a hobby which can be encouraged among students from a very young age. You can encourage your students to collect variety of materials from any one category like, postage stamps of different countries, coins and currency notes, pictures, photographs of eminent persons, different types of rocks, minerals, seeds,

cereals, rice or any food grains, toys, matchboxes, candles, hair pins. Some may collect riddles and puzzles, folk tales and folk songs, limericks, proverbs etc. Collection of any unconventional themes (which can be from any subject area) should be encouraged. The list can be endless. Leave the choice to students and you can see how many choices they can have.

Such collection can be made by the students individually or in groups. After a sizeable number of materials are collected, they can be categorized, labelled for display and stored by the collector(s) who can justify their modes of categorization. These can be displayed in school exhibitions. They can also be part of assessment portfolios discussed in Unit 14.

Not only you can use these materials as meaningful TLMs in classroom transactions, but also based on the collection the students can develop thematic articles which can broaden their knowledge and understanding of several phenomena and concepts which could have been normally difficult on your part to explain and teach. Further, developing such collection may become a lifetime hobby which helps to enrich learning and in the long run helps to build one's personality and character.

The materials which are durable and can be stored for quite a long period of time are to be collected and stored much before the academic session begins. On the other hand, the materials like flowers, fruits, vegetables, food items which are quickly perishable can only be collected on the very day of their use in classroom activities.

- ***Preparation of TLMs***

Besides collecting materials and purchasing desired objects for use as TLMs, you need to develop some materials which are specifically needed for your classroom activities. For teaching and learning specific concepts you very often require some typical materials which are not available in the environment or in the market. For example, you are teaching history of ancient India during the times of Aryans. In order to depict their life style you need some pictures to make the discussion lively. You have no scope to have any such pictures or diagrams of the artefacts of that period. In such a situation, it is better if you can develop some pictures and models as per the requirements of your plan of lesson. Several common materials like flash cards on different themes, number and alphabet cards, models made of paper, clay, thermo-col, and/or wood, charts, graphs, pictures, toys are prepared by teachers and students in most of the schools.

It has now a common practice in the schools to develop such materials out of the grants available from SSA and other sources. While preparing materials you need to consider the following:

- Prepare a list of materials and the approximate quantity of each material that you need to develop much in advance. Preferably plan from the beginning of the academic session.
- Keep sufficient raw materials like paper, drawing sheets, card board, paste, paints, clay, plasticine, thermocole sheets etc. and cutting instruments, scale and measuring tapes and such other tools ready for use as when required.
- Involve students in planning and preparing the materials. Their involvement is crucial in these activities because they love to be active in such creative activity, but they will learn a great deal incidentally while planning and preparing the materials. Further, they would be extremely careful in handling and preserving the materials as they would not like to damage the things they have developed.
- While planning and developing TLMs, focus more on preparing such materials which are durable, usable in multiple ways on different occasions and in more than one subject/content area.
- Arrange exhibitions in your school where students would demonstrate the TLMs they have developed in their respective classes. This would encourage the students to compete for developing further useful and innovative materials.
- Identify talented students, resourceful colleagues, and local artisans and seek their guidance in developing the materials.

- ***Storing TLMs***

Careful storing of the TLMs facilitates in easier handling and inprevention fromany damages to the materials. Since there is need for acquiring more and more materials, you need to give attention to their proper storage. The following minimum conditions need to be ensured for proper and safe storage of materials:

- For ease of access and use the materials, the storing place should be inside the classroom or nearer to the classroom (see Learning Corner).
- Arrange the materials in different categories and accordingly place them separately in the racks, almirah or shelf. For example, different types of seeds are to be sorted out and each type of seeds is to be kept in a separate polythene packet or jar. Flash cards are to be sorted theme-wise and kept in separate packs. Similarly other materials like rocks, minerals, pictures, charts etc are to be properly arranged.
- TLMs used for one time / several times may be kept separately
- The rack where the materials are stored need not be too high, rather should be within the reach of the students. Because the students would be doing everything from categorizing, packing, arranging in the rack, using and rearranging after the use.

- You should take care to see that the storing arrangement should be such that the TLMs do not get damaged. The storing place should be properly disinfected to be free from termites and cockroaches.

6.4.2 Using and Maintaining TLMs

It is seen that when TLMs are being used in a class, the teachers use them mostly for demonstration purpose. While explaining a topic ora concept or solving amathematical problem, they usually use one or a few moderately large size objects to be visible to all students in the class. In such a situation of teaching through demonstration of TLMs, the students have very little chance of using the TLMs themselves. It is also observed that sometimes teachers do not allow students to handle the TLMs with a belief that it may get damaged by careless use. In such cases the preservation of the TLMs gets priority over students learning. In many schools, the TLMs are centrally kept under lock and key with periodical stock verification of the articles. As a result, most teachers feel that they are accountable for any loss or damage of the materials. In several schools it is also observedthat TLMs are rarely used and hence planning for the use of TLMs is never done. Often teachers of such schools complain that due to pressure of work, it is not possible for them to make proper planning for the selection and use of the TLMs in the classroom ignoring the fact that more the students handle TLMs in course of their learning activity, better is their learning performance. From the management point of view the preservation of TLMs is important but what is more important is the students' active manipulation of those materials. Keeping these facts in mind, here are some suggestions to be considered for proper use and preservation of TLMs in the classroom:

- Ensure availability of sufficient TLMs in the classroom for the free use of the students.
- While preparing your lesson notes in a subject for a specific period, plan for the TLMs to be used for demonstration, for group work and for individual work. These lesson notes should be prepared well in advance much before the beginning of the period.
- If you are planning to use the locally available perishable materials, entrust some students to collect those from the locality and come with them to the class.
- Before the commencement of the period, collect all the materials from the school store or from other sources.
- Ensure that the TLMs selected are relevant to the topic and within the understanding level of the students.
- Use wall activities, floor activities, materials prepared inside and outside the classroom like garden, playground etc. as sources of learning.

- Create a small group of students in your class who would be the leaders in collection, preparation, and maintenance of the TLMs in the classroom. They should be given the responsibility to sort out the required TLMs before the commencement of the period and to replace the materials in their respective storing places after the period is over. The group may be changed every month.
- For better maintenance, keep a record (stock book) of TLMs in your class. It would facilitate in locating the damaged and lost articles so as to have timely replacement of those articles.
- Once in a month the TLM stock should be checked and the store cleaned up properly.

With increasing emphasis on the wider and frequent use of TLMs, it has been felt to keep these materials within easy reach of the students and teachers that is within the classroom. The concept of *'Learning Corner'* or more specifically *'TLM Corner'* has hence developed which can be seen in several schools and is expected to be in every classroom in future. Let us understand this concept.

6.4.3 TLM Corner and its Use

A *TLM Corner* is a corner or a place in the classroom convenient to all where all the TLMs used for learning and teaching of different subjects are kept systematically so that both teachers and students can use it with ease.

All the materials may be arrangedsubject or theme-wise in such a manner that all students can fetch and replace them easily. Besides the TLMs, you can store several other materials and equipment in this corner like work sheets, the scales, balance and weights, pliers, scissors, hammer, drawing sheets, colouring materials, gum, plain paper, etc.

In a room which accommodates a single class, the TLM corner can be created near the back corner of the room. But in a room which accommodates more than one class, you have to decide the placement of the learning corner. If sufficient place is available, then class-wise TLM corner can be created. Otherwise, one TLM corner may be created in the room equipping with the materials required for transactions of all the classes in the room. In such cases, the arrangement of TLMs subject-wise and class-wise has to be planned with care to avoid confusion.

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ACTIVITY-6

Prepare a list of materials that you would like to store and display in the TLM corner in your classroom.

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6.5 TEXTBOOKS AS TLM

Textbooks have always been regarded as the most essential part of school education. A teacher might not have seen the curriculum or syllabus but he/she cannot teach without a textbook. A textbook is developed by subject experts and experienced teachers strictly based on the prescribed syllabus of the subject for a particular class. The topics in a textbook and the concepts within a topic are arranged in a specific order as per the syllabus and decided by the expert group who developed the textbook. Therefore, the textbook is considered as the sum total experience of the school curriculum in respective subject areas by the students, teachers, parents and all other stakeholders. Since the textbook aids in teaching as well as learning it can be considered as the most befitted TLM.

How do we use the textbook for teaching and learning?

As teachers, we usually follow the textbooks literally without disturbing the content and the sequence of the topics and get the students complete the exercises given at the end of each topic. The students' performances at the school are evaluated based on the test prepared on the contents of the textbooks. It will not be wrong to say that all the curricular activities in the school are completely based on the topics of the prescribed textbooks. Textbooks are recognized as the basic material for teaching and learning.

E6. State any four uses of the textbook in the classroom teaching-learning process.

6.5.1 Textbooks for Learning

For several reasons, textbooks continue to be the main source of teaching and learning in schools and are the only source of students' learning in most of the schools. How do we use the textbook as an effective learning material?

Read the two instances of use of the textbook in the classroom in the following situation:

Situation 3:

- *Mr.Praveen was teaching language in class V. He was following a sequence of teaching activities like reading the passage loudly, selecting randomly some students and making them to read the passage loudly, silent reading by the students, exposition of the meaning of difficult words through framing of sentences, asking some comprehension questions, asking a few questions for assessing students' understanding and finally giving an assignment to write*

- *Ms.Shakila on the other hand was introducing fractions to her students in class IV. She typically focused on the numerical examples given in the mathematics textbook exposing the numerator and denominator of a fraction, proper and improper fraction, addition and subtraction of fractions.*

  Both Mr.Praveen and Ms.Shakila underwent in-service teacher training programmes on activity-based approaches of teaching-learning process. After they came back from the training they changed their style of teaching as follows.

  Mr.Praveen was seen to use a lot of activities while teaching the same passage from the language textbook of class V. He asked the students to read the passage following which several activities were done by the students like,

  – *Framing questions on the passage.*

  – *Writing a small passage using selected words from the passage.*

  – *Giving synonyms and antonyms of some selected (difficult) words used in the passage.*

  – *Developing a small story in groups of 4 students using the theme of the passage.*

  – *Debating (in groups) about the meaning of the passage and its links with the real life experience.*

  – *Creating dialogues on the passage if it is a story.*

  – *Drawing freehand comic strips to illustrate the story line of the passage.*

  On the other hand before introducing fractions directly from the textbook, Ms.Shakila first analysed the concepts of fractions and the style of presentation in the textbook. She arranged lot of materials, mostly

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collected by the students from the locality like fruits, clay, seeds, pebbles, sticks etc. Using these materials she conducted several activities in the classroom by asking the students to:

- *Divide single objects into two or more equal parts.*
- *From a collection of halves of several objects, figures or pictures, combine and form the complete objects, figures and pictures.*
- *Represent one portion of the equal parts of an object in the fraction form like* $\frac{1}{2}, \frac{1}{3}, \frac{1}{5}$
- *Represent several equal parts of an object in the proper fraction form like* $\frac{2}{3}, \frac{3}{4}$, *etc.*
- *Divide a collection of objects (like marbles, sticks etc.) into several possible equal parts and then to represent the equal portions in proper and improper fractions.*
- *Draw pictures and diagrams in line with those in the textbook and colouring the pars indicating different fractions.*
- *Prepare a list containing examples of proper and/or improper fractions within a time limit (say within 5 minutes).*
- *Frame questions on fractions (not repeating or similar to those given in the textbooks).*

From the above situation you can realize that the textbook can be used as one of the best source of learning if properly used because of its following characteristics:

- Following the recommendations of the NCF 2005, the textbooks have now been developed very systematically indicating teachers' activities and learners' activities in and out of the classroom. These provide a lot of scope for the students and the teacher to do a lot of learning activities.
- The concepts related to a topic are organized in a comprehensive way in the textbook which gives sufficient idea for organizing a lesson. A less imaginative teacher may strictly follow the order of arrangement of concepts while teaching in the classroom, while a resourceful teacher will study the arrangements in the textbook carefully and may evolve alternative arrangements of concepts which would be more interesting and more meaningful for students.

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- The concepts are presented with a variety of activities like song, story, pictures, puzzles and discussions which create interest among the students to learn more. From these materials presented in the textbook, you can gain insight as to innovate several activities and materials available in your surroundings with little cost and effort.
- To strengthen the concepts taught, a number of practice activities are given for the students to do. These practice activities will provide you with ideas to generate several such activities and more innovative practices for your students. In this context a textbook is an excellent available TLM.
- The new textbooks have been developed not merely to give factual information but also with the scope for student interaction. For example,spaces have been left for students to focus on elaboration of concepts and activities, for wondering about problems, doing exercises which encourage reflective thinking and small – group work.
- The activities and exercises given in the textbook can also be used to assess the extent of learning each student has acquired at the end of the topic/lesson. These exercises will help you to develop several types of test items (questions or activities) which you can use in the unit tests or in any other assessment situations.

ACTIVITY - 6

Take a topic from any of the textbooks that you are dealing with. List out the activities and materials you can use to transact the topic in the classroom.

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In order to further strengthen the learning of students from the textbooks, additional TLM materials are also being provided through SSA.The ways to use and transact the textbooks are available in the Teachers' handbook.

According to NCF-2005, any good textbook should function as a guide to construct understanding through active engagement with text, ideas, things, environment and people rather than "transferring knowledge as a finished product".

6.5.2 Learning Beyond the Textbooks

Over dependence on the textbooks has developed the belief that the textbooks contain everything a teacher is required to teach and a student is expected to learn. As a result,

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the teachers are busy in completing the textbooks word by word and the students try to learn by heart every line of the textbook in order to reproduce in the examination answer scripts. Thus, the textbook has been accused of promoting rote learning.

We need to recognize that although textbook is one of the essential material for teaching and learning, it is neither the only material nor it provides all the experiences required to attain the expected learning outcomes. All the curricular experiences cannot be given within the limited space of a textbook. Moreover, learning becomes meaningful, contextual, and relevant when it is acquired in real life or familiar situations. Continuous and purposeful exposures to real life situations for acquiring specific competencies develop a habit in children to search for new knowledge from the familiar environment.

Let us consider any competency that we try to develop in our children in schools through textbooks, say for example, '*developing reading comprehension of class VI children'*. What exactly do we do to develop this competency in the students in school?

Since this is a language competency, we try to develop this in our students through the language textbook usually following the steps:

- Allowing students to read a passage loudly and/or silently,
- Clarifying the difficult words, phrases or sentences,
- Asking questions on the contents of the passage to assess students' understanding the content/ideas in the passage.

In the examination we ask comprehension questions from the contents of the prescribed language textbook. You might have experienced that many students scoring high on language are not proficient in understanding unfamiliar written/printed materials. On the other hand, a child who was exposed to different print or visual materials like story books, comic strips, story cards, newspapers, magazine articles, is more likely to develop reading comprehension easily and perform better in tests on it. Again, solving mathematical problems and topics in EVS also requires reading comprehension. If we plan to develop reading comprehension in our students, we can stress on the meaning of the printed passages/problems irrespective of any specific class or situation.Similarly, it is found that a student who has experienced transactions in the market can perform better and with ease on the problems relating to money transactions, profit and loss etc.

Every element in the immediate environment of the child may be used as a source of learning. We have to have a definite plan to initiate the process of learning from the environment without the help of a textbook. If we successfully manage such incidental learning efficiently, in the long run it would become a habit with the students to gather learning experiences from different sources. Let us try to understand some such sources which we can include in our plan for encouraging our students to learn without only confining themselves to the textbooks:

- ***Library:*** Providing supplementary reading materials on different curricular subject is mainly possible through a well-equipped library. You need to plan for providing enough scope to students to avail the library facility in school even on holidays. It not only develops habit of reading for pleasure, but also helps students to have access to several reference materials like dictionaries, atlases, encyclopaedia, and books on different themes.
- ***Newspapers and Periodicals:*** Information on current affairs, articles of different issues, various interesting features like short poems and stories, comics, games, numerical and other puzzles etc. that appear in the newspapers and periodicals are of immense help to boost the knowledge of students as well as their interest for learning.
- ***Electronic Media:*** Radio, Television, Internet, CDs on various educational themes has opened up the world of knowledge and learning. Most of the schools, even in remote areas are being provided with these facilities. You need to plan to use these devices for educational purposes in your school.
- ***Activities in and out of school:*** There is immense scope for learning activities in and out of school campus. Exemplars of such activities are: observing different objects and phenomena, planning and raising school garden, maintaining clean toilets and toilet habits, cleaning and beautification of classroom and school, arranging different cultural functions etc. The list can be endless.
- ***Visiting Local Institutions:*** Visit to several local or nearby institutions like post office, bank, police station, bus stand, railway station, business and industrial organization, agricultural farms can provide the students the direct experience and profound knowledge of different aspects of the institutions.
- ***Visiting Local Market and Working Places:*** Watching people in action in the market and different working places like farms, blacksmiths, wood work/furniture, poultry, fishery etc. also provides first-hand knowledge of the world of work and at the same time strengthening the basic skills of literacy and numeracy and enhancing the creative and problem solving abilities.

The list can be endless. Prepare a list of such activities that you can conduct for your class.

ACTIVITY - 7

Prepare a monthly plan of activities not involving textbooks for the students of your class (or of any one class) indicating the learning experiences they would gain from each of the activities.

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While you are preparing a plan of the activities, specify the time and duration of each activity, indicating one- time- activities and regular (weekly, fortnightly, monthly, or annual) activities. It is necessary to conduct any such activity with a well prepared plan developed and shared with the students much in advance. Insist that each student take note of important points while participating in the activity. At the end of each activity each student is to prepare a brief report of the experience and knowledge gained.

6.6 LET US SUM UP

- Children in primary schools are in the stage of *Concrete Operations* as suggested by Piaget when they learn by manipulating concrete objects. Therefore, at this stage of learning concrete materials as teaching-learning materials are essentially required.
- The TLMs can be categorized in different ways like real objects or prepared materials; Audio, visual or audio-visual; projected, non-projected, or experiential.
- Materials for activity learning need to be relevant, contextual, and related to real life experiences.
- Utmost care and discretion need to be observed in collecting, using/displaying and storing the TLMs. Developing and maintaining a TLM corner in the classroom with the direct involvement of the students helps both teacher and students in enriching the resources for classroom teaching-learning activities.
- Textbook is an essential material for both teaching and learning.
- There is immense scope of learning beyond the textbooks which need to be harnessed by the teachers and students for enriching and expanding their knowledge.

6.7 MODEL ANSWERS TO CHECK YOUR PROGRESS

E1. C

E2. In Mathematics: Construction of two digit numbers, place values in two digit numbers, preceding and successive numbers etc.

In Language: Formation of words, word games, identifying conjunct letters etc.

E3. In the first situation: There is little scope given to students to understand. They were asked only to copy.

E4. (i) Economically may not be very much viable, (ii) Demonstration of preparing the materials helps to develop skills in learners, (ii) use of multi-sensory organs develop reflective thinking in learners

E5. Non- projected – Black board Projected - film strip,

Audio – Radio, A.V. aids – Television,

Collected – Stones and Fish

E6. (i) Textbook is a useful teaching aid in the hands of the teachers, (ii) helps the teacher to maintain the logical sequence of content matter, (iii) It provides guidelines for student evaluation, (iv) encourages learner to think divergently through its chapters and exercises

6.8 SUGGESTED READINGS AND REFERENCES

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6.9 UNIT END EXERCISE

1. Explain the differences between teaching and learning materials.
2. Describe the different approaches of categorizing TLMs with examples.
3. State the characteristics of materials used in learning activities with examples.
4. How can you arrange a TLM corner in your class room ?
5. Is textbook the only learning material? Explain with examples how can you provide learning experiences beyond the textbooks?