Module II	Non Projected Visual Aids
Unit 9	Objects, Models & Mockups

Instructional Objectives:

1. Differentiate between objects and specimens.
2. Identify the kinds of experience that could be provided by real objects.
3. Classify by definition Models.
4. Name three types of models and their functions.
5. Give five suggestions for effective class-room utilisation of models.
6. Differentiate between models and mockup.
7. Classify by definition an instructional kit.

OBJECTS, MODELS AND MOCKUPS: INTRODUCTION

Is it possible for any one of you, to operate a lathe, a milling machine, do gas or electric welding, or repair a Television receiver on hearing a lecture? Do you think you can owrk with a micrometer or a Sine bar, after a best lecture given by your instructor? If you can, either you are a genius or most probably, you must have previous experience, which was responsible and not the lecture. What is required in such situations are demonstrations in addition to lecture. You must have the first hand experience of handling the tools, equipment etc., in order to operate the same. In all such cases, experience with real things or objects are essential. You go in for aids, when you think that it is necessary to supplement the handling of the real thing or the object.

Our institutions, unlike the general education schools, are quite different. We work with our hands.Eyes and ears are necessary for most of the things, but are not enough, and words alone are too empty to be of much value. Three dimensional materials in teaching plays an important role. You have to allow each trainee to manipulate the real thing, if no sofety problems are involved. For example, a simulator will help you in any industrial situation of explosion, dangerous reactions, etc.

Vocational training often requires not only real things, but it may always be not possible to bring real things. For example a locomotive may not be possible to be brought to the

workshop. For all such cases, solid, cross section and working models, made to scale show materials, functions, processes and principles well.

We will discuss in this unit, simple common three dimensional materials - OBJECT, SPECIMENS, MODELS, MOCKUPS AND KITS - and the use of these materials. For instruction and learning text books are only one aspect of the instructional - learning situation. Their symbolic character needs assistance of concrete materials. Principles can be learned through texts, but for achieving skills, you must have concrete experience.

OBJECTS AND SPECIMENS

As an instructor you might have used an object and also specimen in your instructional situation or at least in your practice teaching. All others must have been their instructors using these in the classroom or workshops. Let us see how we shall define objects and specimens.

Objects are such things as chisels, cutting tools, A.C. or D.C. Motor, Cupola, belt sander. A transistor, transmitter, radio, the television, garments, etc. Objects are real things.

Specimen are part of objects. A specimen is a part of any object The blade of a saw, the handle of a hammer, the beater of an electric mixer, the collar of a shirt, are all specimens.

Objects and specimens are especially useful, because they are real. They are not manipulated representations of reality. They are reality. They can be used to provide the trainees direct experience. The motion picture or sound-slide system may show, how to operate a projector or a lathe, but it does not take the place of allowing the trainee to take into his hands the machine, the tools, the films, the controls, etc. to get direct experience.

Unless there is safety problem and precautions are necessary before allowing them to handle, to get direct experience, you must always encourage without reservation every trainee to handle real things, objects and specimens.

If you have more different items to be handled, one object or a specimen is not enough they need rich and varied learning materials and experiences.

MODELS

Using models, are experience of man from childhood. You play with dolls, miniature cars, tools, and innumerable toys. When you grow older, you use models for many purposes. Before you plan to build a house, first you may use a two dimensional cutouts, or if you have more facilities, a three dimensional model of the house, with miniature furniture, kitchen facilities etc. It is standard practice with any designer, to use models.

Models are scaled representations of real things. Models are sometimes more serviceable, than real things. They can be handled, they can be used over and over again. Sometimes, they are more readily available than real objects. Models may be of the same size, smaller or larger than the things they represent. They are always similar in appearance to the thing they represent. Thus a model of the Ennore Thermal Station which would be three dimensional, would have the same relative dimensions as the original, and would show you exactly what the Ennore thermal station is.

There are three types of models:

1.	Solid models	: They are used chiefly for recognition of external features.
2.	Cross Section models	: They reveal internal structure.
3.	Working models	: They demonstrate function or processes.

Each has a distinctive contribution to make in instruction. Solid models are the types most commonly used; they are easy to make, and they serve well within certain limits. Cross section or cutway models, because they permit the viewers to have a look at the insides of things have unusual instructional values. Cutaway models permit the viewer to see the interior of a gas engine, a furnace, the parts of a lathe, or the stratification of the earth's crust. Working models are designed to show trainees how things function. Good working models often use contrasting colours for parts of gear, cables, circuits or other components so that trainees can see how they are fitted together, can trace their leads and can see them move. Trainees will find the working models more fascinating, and it can motivate them well.

Should a model be an enlarged or reduced representation of the original? The answer depends on the nature of the original. Models of boilers or furnaces would be reduced representations, models of cutting tools, chuck, gears, etc. could be enlarged. The size of the group which is going to make use of the model must also be considered.

Limitations:

The instructor must be sure that the trainee is aware of the element of size - the model may be actual size, enlarged, or

reduced. In the case of enlargement and reduction, the trainee must be given the element of size change, which the model represents. A model of the camera, in which each part is easily removed and replaced may appear simple. It is highly desirable wherever possible, the trainees must be allowed to see and feel the real objects side by side, or at least afterwards, so that there can be no doubt about the relationship of the two.

When you are using a part of a model, you point out that the model is incomplete, if it be so to the trainees, so that they will not carry any wrong impressions, which will result in incorrect exposure.

* Suggestions for utilisation:

1. PROPER SIZE IS IMPORTANT.

   Every person must be able to see well from his seat the model.

2. IT IS A MISTAKE TO PASS A SMALL MODEL TO THE STUDENTS AND THEN TALK ABOUT IT.

   Students will not concentrate on the talk or explanation, but they will on the model.

3. YOU SHOULD HAVE A DEFINITE PURPOSE IN MIND IN INTRODUCING THE MODEL.

   They should not be used merely to fill up time.

4. YOU SHOULD ENCOURAGE TRAINEES TO PARTICIPATE IN THE CLASS.

   They should be induced to ask questions, discuss, examine critically, so that they will learn as much as possible from the model.

5 5. YOU SHOULD INTRODUCE MODELS IN SETS WHEN IT IS DESIRABLE.

   Comparisons of sizes, use, quality, purposes call for introducing a set of models. Cutting tools, chisels, files etc require introduction of a set of models.

6. MODELS SHOULD BE INTRODUCED IN A DRAMATIC MANNER.

   Use anecdots or historical analogies and dramatise the the presentation.

7. YOU SHOULD INTEGRATE MODELS WITH OTHER INSTRUCTIONAL MATERIALS.

8. YOU MAY BETTER USE FEWER MODELS, THAN A NUMBER OF INAPPROPRIATE ONES.

   Avoid confusing the trainees by presenting too many models that are not appropriate.

9. WHEN YOU USE DIFFERENT MODELS, BE CAREFUL TO EXPLAIN RELATIVE SIZES TO THEM.

   When you use a model of a lathe and again the model of cutting tools, and when the scales differ, explain this to your trainees.

10. AFTER USE, KEEP THEM PROPERLY LABELLED FOR FUTURE UTILISATION.

    If this is not done, you may not be able to use it again, or spot when required.

MOCK UPS

During the world war II, the U.S. Armed Services were increased beyond proportions. When the authorities, found that the Military training had to be given to those who had little previous training quickly and efficiently, the Armed Services devised various teaching aids, to accomplish their goals. Real objects, models and mockups were given unusual emphasis for the first time. Actual objects such as airplanes, tanks, battleships were not available at all times in the training programme, nor were they considered necessary in certain stages of the training. In the early stages of training, mockups can easily replace REAL THINGS.

A MOCK UP IS DEFINED AS A CONTRIVED OR SIMULATED THREE DIMENSIONAL DEVICE WHICH IMITATES CERTAIN ASPECTS OF THE REAL THING.

A mock up differs from a model in that it is not necessarily similar in appearance. You may have the mockup for the car driving controls, and before actually using the real car, you can use the controls in a mockup. Similarly for any machine, you may make mockups for getting acquinted with various parts and controls. The magnetic welding torch system, is a very good example for getting the proper placing and holding of the torch during welding operation.

For our situations, the mock ups for driving training will be very useful and interesting. You can make mockups for showing how the wiring system of a house, works. You can show the circuit, the conduit, the insulators, the switches, the fuse box, the lights, etc. You can show how and when over loaded the circuit breaks by fuse blows. It is really a modified and abridged real system. Modified because the real details are placed on a board instead of in the walls of a house, abridged because the length of the wires is much shorter than in an actual house.

In teaching young children to read the time, mockup of the real clock is a very good example.

Whenever you are teaching a complicated process, ask yourself: Would a mock-up help? Would it help you explain a mechanical device? A mockup includes only parts of the process. Models and mockups are in some ways more useful than objects which they

represent. They show some selected aspect of the whole in a simple, elemental way. By constructing models and mockups, you show some specific aspect of the original object.

KITS:

KITS are items related to a particular unit study. The term kit denotes Educational/Instructional Kits used for educational and training purposes. Such Kits usually contain Materials and tools for instruction, to be used for specific instructional purposes. Such items like Mecano assembly sets, or the plastic building blocks which can be used for model buildup are kits. Such kits may also form a part of multi media instructional package programmes.

We make self study materials consisting of a number of things such as information sheets in small units or modules, sound-slide systems consisting of slides and tapes, workbooks, film strips, audio tapes, television tapes or video tapes, 16 mm or 8 mm movie films etc. All these can be called kits.

Kits could be assembled so that each would be a unit in itself.

NCERT has produced a number of kits on many subject. Geography, History, Social Studies, Science etc. These kits consist of maps, globes, models, pictures, mockups etc. These kits are assembled so that each would be a unit in itself. Kits for magnetism, electricity (for general course), principles of light, etc are produced by CSTARI, Calcutta.

The problem with the kits is their maintenance. After kits have been used, they need to be checked and replenished whenever it is required. Some commercial companies offer kits for the auto trades, electrical and wireman trades.

You may try to collect some kits for your topic of study.

LEARNER ACTIVITIES:

TARGET DATE FOR SUBMISSION IS 23rd MAY

1. List and explain some three dimensional materials found or used in your trade at the Central Training Institute.

2. What in your opinion is the necessity to use the model of a tool, when the real object is available for teaching.

3. You are to teach, how to operate a slide rule. Would you use a model or mockup? Will it be a large sized or small sized one? In what way do you consider your devision will help your trainee learn better?

4. Give an example in your trade area, of using
(i) real object (ii) model (iii) mock up for class room or workshop.
Give reasons for your choice.

5. Fill up the blanks:

   a. Models are always _____ in appearance to things they represent.
   b. A specimen is _____ of an object.
   c. Objects and models are classified as _____things.
   d. The mockup differs from a model in that it is not necessary that it is similar _____.
   e. The first aid box is classified as a _____.

6. Prepare models using thermocole, plywodd, cardboard, andor fibre board, as a project, after getting your topic approved.

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AUDIO VISUAL EDUCATION

Module II : Non Projected Visual Aids.

Unit 9 : Objects, Models & Mockups.

Practical Exercise No. 34 : Thermocole Cutouts.

A. PROBLEM : Prepare cutout letters for a given word with Thermocole and colour the same. Display the same on bulletin board.

B. PROCEDURE:
1. Take 25 mm thick Thermocole sheet.
2. Print the letters on the sheet.
3. Keep allowance and cut by Thermocole cutter or by thin knife.
4. Finish the letter by sand paper.
5. Colour the letter as required.
6. Display the letter on the bulletin board.

C. MATERIALS:
1. Thermocole sheet.
2. Thermocole cutting machine - knife.
3. Sand paper.
4. Poster colour.
5. Bulletin board.
6. Fixing pin or glue.

D. POINTS FOR GRADING:
1. Marking and writing of letters.
2. Cutting of letters and its accuracy.
3. Overall finish.
4. Colouring and appearance.
5. Display of letters on the bulletin board and display technique used.

E. DEADLINE FOR THE PROJECT : May 23rd.

BULLETIN BOARD EXERCISE

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